

The GALE
ENCYCLOPEDIA
of MEDICINE

SECOND EDITION

The GALE ENCYCLOPEDIA *of MEDICINE* SECOND EDITION

VOLUME

5

T-Z
ORGANIZATIONS
GENERAL INDEX

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The GALE ENCYCLOPEDIA of MEDICINE SECOND EDITION

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PLEASE READ—IMPORTANT INFORMATION

The *Gale Encyclopedia of Medicine 2* is a medical reference product designed to inform and educate readers about a wide variety of disorders, conditions, treatments, and diagnostic tests. The Gale Group believes the product to be comprehensive, but not necessarily definitive. It is intended to supplement, not replace, consultation with a physician or other healthcare practitioner. While the Gale Group has made substantial efforts to provide information that is accurate, comprehensive, and up-to-date, the Gale Group makes no representations or warranties of any

kind, including without limitation, warranties of merchantability or fitness for a particular purpose, nor does it guarantee the accuracy, comprehensiveness, or timeliness of the information contained in this product. Readers should be aware that the universe of medical knowledge is constantly growing and changing, and that differences of medical opinion exist among authorities. Readers are also advised to seek professional diagnosis and treatment for any medical condition, and to discuss information obtained from this book with their health care provider.

INTRODUCTION

The *Gale Encyclopedia of Medicine 2 (GEM2)* is a one-stop source for medical information on nearly 1,700 common medical disorders, conditions, tests, and treatments, including high-profile diseases such as AIDS, Alzheimer's disease, cancer, and heart attack. This encyclopedia avoids medical jargon and uses language that laypersons can understand, while still providing thorough coverage of each topic. The *Gale Encyclopedia of Medicine 2* fills a gap between basic consumer health resources, such as single-volume family medical guides, and highly technical professional materials.

SCOPE

Almost 1,700 full-length articles are included in the *Gale Encyclopedia of Medicine 2*, including disorders/conditions, tests/procedures, and treatments/therapies. Many common drugs are also covered, with generic drug names appearing first and brand names following in parentheses, eg. acetaminophen (Tylenol). Throughout the *Gale Encyclopedia of Medicine 2*, many prominent individuals are highlighted as sidebar biographies that accompany the main topical essays. Articles follow a standardized format that provides information at a glance. Rubrics include:

Disorders/Conditions	Tests/Treatments
Definition	Definition
Description	Purpose
Causes and symptoms	Precautions
Diagnosis	Description
Treatment	Preparation
Alternative treatment	Aftercare
Prognosis	Risks
Prevention	Normal/Abnormal results
Resources	Resources
Key terms	Key terms

In recent years there has been a resurgence of interest in holistic medicine that emphasizes the connection between mind and body. Aimed at achieving and maintaining good health rather than just eliminating disease,

this approach has come to be known as alternative medicine. The *Gale Encyclopedia of Medicine 2* includes a number of essays on alternative therapies, ranging from traditional Chinese medicine to homeopathy and from meditation to aromatherapy. In addition to full essays on alternative therapies, the encyclopedia features specific **Alternative treatment** sections for diseases and conditions that may be helped by complementary therapies.

INCLUSION CRITERIA

A preliminary list of diseases, disorders, tests and treatments was compiled from a wide variety of sources, including professional medical guides and textbooks as well as consumer guides and encyclopedias. The general advisory board, made up of public librarians, medical librarians and consumer health experts, evaluated the topics and made suggestions for inclusion. The list was sorted by category and sent to *GEM2* medical advisors, certified physicians with various medical specialities, for review. Final selection of topics to include was made by the medical advisors in conjunction with the Gale Group editor.

ABOUT THE CONTRIBUTORS

The essays were compiled by experienced medical writers, including physicians, pharmacists, nurses, and other health care professionals. *GEM2* medical advisors reviewed the completed essays to insure that they are appropriate, up-to-date, and medically accurate.

HOW TO USE THIS BOOK

The *Gale Encyclopedia of Medicine 2* has been designed with ready reference in mind.

- Straight **alphabetical arrangement** allows users to locate information quickly.
- Bold-faced terms function as **print hyperlinks** that point the reader to related entries in the encyclopedia.

- **Cross-references** placed throughout the encyclopedia direct readers to where information on subjects without entries can be found. Synonyms are also cross-referenced.
- A list of **key terms** are provided where appropriate to define unfamiliar terms or concepts.
- Valuable **contact information** for organizations and support groups is included with each entry. The appendix contains an extensive list of organizations arranged in alphabetical order.

- **Resources section** directs users to additional sources of medical information on a topic.
- A comprehensive **general index** allows users to easily target detailed aspects of any topic, including Latin names.

GRAPHICS

The *Gale Encyclopedia of Medicine 2* is enhanced with over 675 color images, including photos, charts, tables, and customized line drawings.

ADVISORY BOARD

A number of experts in the library and medical communities provided invaluable assistance in the formulation of this encyclopedia. Our advisory board performed a myriad of duties, from defining the scope of coverage to reviewing individual entries for accuracy and accessibility. The editor would like to express her appreciation to them.

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T

Taeniasis see **Tapeworm diseases**

Tagged red blood cell scan see **GI bleeding studies**

T'ai chi

Definition

T'ai chi is a Chinese **exercise** system that uses slow, smooth body movements to achieve a state of relaxation of both body and mind.

Purpose

As a system of physical exercise used to improve and maintain health, t'ai chi can be helpful in achieving a state of physical and mental relaxation while also strengthening the cardiovascular system.

Precautions

As a very slow and gentle form of moving, t'ai chi has virtually no side effects. However, if a person has any doubts about the condition of his or her joints, vertebrae, or heart, a physician should be consulted.

Description

Developed originally in China as a self-defense strategy, or martial art, t'ai chi—the “supreme ultimate fist”—is practiced in modern times primarily as a gentle exercise technique. Described as “meditation in motion,” t'ai chi consists of a standing person performing a series of postures or bodily movements in a slow and graceful manner, with each movement flowing without pause to the next. According to Chinese legend, the technique was created by a Taoist monk who was inspired as he watched a crane and a snake do battle. Impressed by the snake's ability to subtly and swiftly avoid the bird's thrusts, he devised a series of self-defense techniques

that do not involve meeting the opponent's force with force, but rather stress evading the blow; causing the opponent's own momentum to work against him.

T'ai chi is an ancient form of exercise, about 2,000 years old, that at one point had over 100 separate movements or postures. In current practice, there are two popular versions, of 18 and 37 movements respectively. The fact that in China 10 million people practice some type of t'ai chi daily suggests that it is one of the most popular forms of exercise in the world. In the United States, t'ai chi is learned in classes in which students (or “players,” as they are called in China) wear loose, comfortable clothing and either go barefoot or wear only socks or soft shoes on the feet. In China, t'ai chi is almost always practiced outdoors at dawn, and ideally near trees. Unlike other martial arts, t'ai chi is not competitive. Classes usually begin with a few minutes of standing **meditation** to calm the mind and gather energy. Following warm-up exercises, students are taught the basics of a particular form or posture. Learning forms is not easy, and it takes some time to master what looks like a simple position. Properly done postures are done in a relaxed, artful, and linked way, with the circular and rhythmic movements of one position flowing seamlessly into the next.

While strict attention to body position is critical, proper breathing is considered to be equally important. Just as movements are slow and continuous and without strain, breathing should be effortless yet deep. Finally, both mental and physical balance is considered essential to t'ai chi. The experienced practitioner of t'ai chi maintains perfect body balance throughout the exercise series. Altogether, the five essential qualities of t'ai chi are:

- Slowness. To develop awareness.
- Lightness. To make movements flow.
- Balance. To prevent body strain.
- Calmness. To maintain continuity.
- Clarity. To focus the mind.

T'ai chi has both physical and mental benefits. If done regularly, it improves muscle tone, flexibility, balance, and



T'ai chi is a Chinese exercise system that uses slow, smooth body movements to achieve a state of relaxation. The posture above is part of the single whip sequence of t'ai chi motions. (Illustration by Electronic Illustrators Group.)

coordination. Many older people find that it boosts their energy, stamina, and agility, sharpens their reflexes, and gives an overall sense of well-being. The calming and meditative aspects of t'ai chi allow many to experience its ability to relieve **stress**. Some claim t'ai chi to be a healing therapy, and it is often used to support other treatments for chronic conditions; arthritis and digestive disorders are just two examples. Like **yoga**, t'ai chi has several different styles to suit the individual. Also, it can eventually be done daily by oneself, and ultimately becomes a very personal endeavor. Most Westerners find it best to practice t'ai chi in the same place and at the same time of day, and those who enjoy it most are those who are not seeking major, dramatic breakthroughs, but rather who can take pleasure in small gains that accumulate over a long period of time.

Risks

T'ai chi is a safe exercise system for people of all ages and fitness levels. Done properly, without any over-stretching, t'ai chi should not leave a person feeling tired or sore.

Normal results

Besides its overall fitness benefits and **stress reduction** aspects, regular t'ai chi sessions are said to be especially helpful for seniors, as they lower their blood pressure. T'ai chi claims to benefit arthritis sufferers, those recovering from an injury or rehabilitating their hearts, and also improves balance, and therefore, reduces the risk of

KEY TERMS

Arthritis—Inflammation of the joints.

Cardiovascular—Relating to the heart and blood vessels.

Continuity—Uninterrupted and successive.

Meditation—An exercise of contemplation that induces a temporary feeling of relaxation.

Stamina—Staying power, endurance.

Yoga—A system of exercise aimed at promoting the control of the body and the mind.

falling, especially important for the elderly. T'ai chi can result in a significant improvement in the quality of life for anyone. But, because of the low stress level of the exercises it is a particularly attractive form of exercise to seniors.

Resources

BOOKS

Crompton, Paul. *T'ai Chi*. New York: Macmillan, 1996.
Guiness, Alma E. *Family Guide to Natural Medicine*. Pleasantville, NY: The Reader's Digest Association, Inc., 1993.
Parry, Robert. *T'ai Chi*. Chicago: NTC Publishing Group, 1997.

PERIODICALS

Brody, Jane. "T'ai Chi Offers Gentle, Stylized Exercises." *The New York Times*, 16 July 1997, C1.
Krucoff, Carol. "Western Science Studies Healing Effects of Ancient Eastern Practice." *The Washington Post*, 14 April 1998, 28, 30.

ORGANIZATIONS

The Northeastern T'ai Chi Chuan Association. 163 West 23rd St., 5th Floor., New York, NY 10011 (212) 741-1922.

Leonard C. Bruno, PhD

Tailbone injuries see **Coccyx injuries**

Talipes see **Clubfoot**

Tamoxifen see **Anticancer drugs**

Tamponade see **Cardiac tamponade**

Tapeworm diseases

Definition

Tapeworms are a group of parasitic worms that live in the intestinal tracts of some animals. Several different

species of tapeworms can infect humans. Tapeworm disease or cestodiasis occurs most commonly after eating raw or undercooked meat or fish that contains the immature form of the tapeworm.

Description

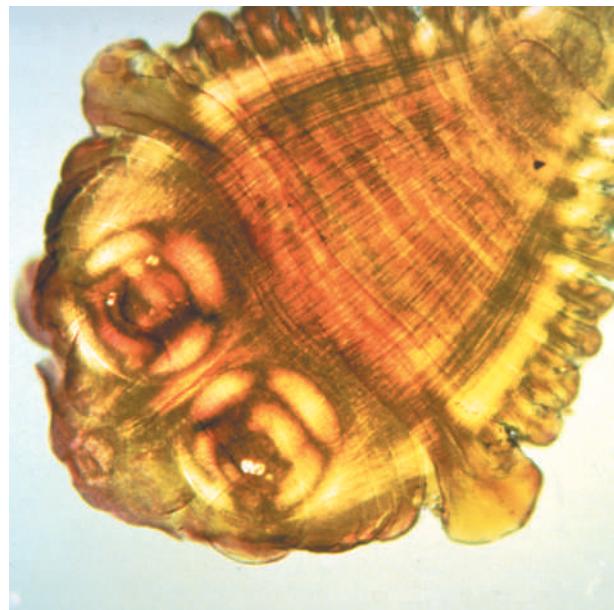
Tapeworm infections pose a serious public health problem in many less developed countries due to poor sanitation conditions. The disease is most common where livestock, such as cattle and pigs, are raised in areas where human feces are not disposed of in a sanitary manner. Another common source of human tapeworms are certain species of freshwater fish. Tapeworm infections tend to occur more frequently in areas of the world where the people regularly eat raw or undercooked beef, pork, or fish. Persons of all ages and both sexes are susceptible to tapeworm infection, but children are generally not exposed until they are old enough to begin eating meat or fish.

Tapeworm is less common in industrialized regions of the world, but travel to areas in which tapeworm infections are more common and immigration of people from these areas serve as new sources of the parasite. Infected persons are often unaware of the presence of adult tapeworms in their intestinal tract, as they may have no obvious symptoms of infection. Some tapeworms can live in an infected person for over 10 years if diagnosis is not made and treatment is not administered.

In addition to the typical infection caused by eating undercooked meat or fish, people may also be directly infected by ingesting tapeworm eggs shed by the adult worm. This type of tapeworm infection can lead to a condition referred to as cysticercosis, in which the larvae continue to develop within tissues other than the intestinal tract. One of the most serious forms of this disease occurs when the tapeworm larvae infect the central nervous system, a disease referred to as neurocysticercosis. In contrast to a typical tapeworm infection, which may not be associated with symptoms, neurocysticercosis is a serious condition that may cause seizures and is potentially life-threatening.

Causes and symptoms

Several species of tapeworm can infect people. The two most common species are the pork tapeworm (*Taenia solium*) and the beef tapeworm (*Taenia saginata*). Improperly treated human sewage may be used to fertilize pastures or crops. Pigs or cattle become infected by grazing in contaminated pastures or drinking water contaminated with tapeworm eggs from human feces. The peasized larvae of these tapeworms are deposited in certain tissues of the body of infected pigs and cattle, including the muscles. The infection is then transmitted to people



The head of an adult beef tapeworm. (Custom Medical Stock Photo. Reproduced by permission.)

when raw or undercooked meat containing tapeworm larvae is consumed. The immature tapeworm develops into the adult form in the human intestine and may remain there for many years if not identified and treated.

The *Taenia* tapeworms attach to the intestinal walls but cause only mild inflammation at the site of attachment. As a result, most tapeworm carriers show no symptoms (asymptomatic) and usually become aware of the infection only after noticing tapeworm segments in their feces. Segments of the beef tapeworm may spontaneously pass through the anus causing a noticeable sensation. Mild gastrointestinal symptoms, such as nausea or abdominal pain, can occur in infected individuals. In rare cases where the tapeworm segments migrate into the appendix, pancreas, or bile duct, there may be a sudden onset of severe abdominal discomfort.

Cysticercosis is a potentially serious complication of *Taenia solium* infection in which the larvae develop outside the intestinal tract. This type of infection is less common and occurs following accidental consumption of tapeworm eggs released from the adult worm. These eggs initially are localized in the anal area, but they may also contaminate the fingers or other parts of the body. Infection can occur in the person harboring the adult tapeworm or in other people with whom that individual comes in contact. The tapeworm larvae may develop in various tissues throughout the body. The most serious clinical problems occur when the larvae develop in the central nervous system (neurocysticercosis), potentially



The head of an adult pork tapeworm. (Custom Medical Stock Photo. Reproduced by permission.)

causing seizures and other neurological problems. An important aspect of this type of infection is that poor hygiene on the part of the individuals harboring an adult tapeworm can lead to an infection in an individual who may never consume meat. This is a particular problem if infected individuals are employed as food handlers.

Another important tapeworm that may infect people is the fish tapeworm (*Diphyllobothrium latum*). This is a frequent human intestinal parasite in many areas where raw freshwater fish is consumed. Human infection with the fish tapeworm is referred to as diphyllobothriasis. Feces from infected hosts or raw sewage contaminates a fresh water source. Tapeworm larvae are initially ingested by freshwater crustaceans and then are eaten by fish. Human infection occurs when a person consumes raw fish contaminated with the tapeworm larvae. Adult tapeworms then develop in the human intestinal tract.

Most infections with the fish tapeworm are not associated with symptoms. The tapeworm causes little damage to the lining of the intestine. Infected individuals may report **diarrhea**, **fatigue**, weakness, or sensations of hunger more commonly than uninfected individuals. One problem unique to this tapeworm is that it may compete with the host for absorption of vitamin B₁₂ from the small intestine, causing the person to become deficient in this vitamin and leading to a condition called **pernicious anemia**.

Two smaller species of tapeworms may also infect people. The dwarf tapeworm (*Hymenolepis nana*) is a common infection throughout the world that can be

passed from one person to another. Transmission is usually the result of inadvertent ingestion of tapeworm eggs from feces eliminated by infected individuals. As a result, infection with this tapeworm is encountered most frequently in children, the developmentally disabled, and psychiatric patient populations. Abdominal pain that is not localized to any particular area is the most common complaint. Patients may experience loose bowel movements or diarrhea with mucus, but bloody diarrhea is rare.

Another small tapeworm capable of infecting people is the rodent tapeworm (*Hymenolepis diminuta*). Rats, mice, and other rodents are the usual hosts for the adult tapeworm (definitive host), but humans can become infected following accidental consumption of insects containing tapeworm larvae. Meal worms or grain beetles that infest cereal, flour, or dried fruit are the most likely source of infection. Most human infections are not associated with symptoms, although some individuals report headaches, anorexia, nausea, and diarrhea.

Diagnosis

Identification of tapeworm segments or eggs in a stool sample is necessary for diagnosis of an adult tapeworm infection. In many cases, a tentative diagnosis may be made on the basis of a patient's description of short chains of tapeworm segments in their stool. Further evaluation is recommended to determine the actual species involved since infection with *Taenia solium* is potentially more serious due to the added risk of cysticercosis. Whenever possible, tapeworm segments should be carefully collected in water or salt solutions, using strict precautions to avoid contamination. Stool examination should be performed in a laboratory having experience in the diagnosis of intestinal parasites. It is recommended that at least three stool samples be collected on alternate days to increase the likelihood of being able to make an accurate diagnosis.

Although the general appearance of tapeworm segments from the two *Taenia* species is quite similar, trained laboratory personnel can detect distinct differences between the beef and pork tapeworms when samples are examined under a microscope. Tapeworm segments and eggs from the fish tapeworm and the dwarf tapeworm have characteristic appearances that allow accurate differentiation from the *Taenia* species of worms. Other diagnostic procedures may be necessary when cysticercosis is suspected. Blood samples from an infected individual are collected to look for the presence of antibodies against the tapeworm larvae. In cases in which infection of the central nervous system is present, advanced imaging tests, such as **computed tomography scans** and **magnetic resonance imaging** (MRI), may be necessary to determine the exact location of the tapeworm larvae within the body.

KEY TERMS

Cestodiasis—Parasitic infection caused by the presence of adult tapeworms of the class Cestoda within the intestinal tract. Infection is caused by accidental consumption of tapeworm larvae.

Cysticercosis—Parasitic infection caused by the presence of immature tapeworm larvae (cysticerci) that have developed outside the intestinal tract. Infection is caused by accidental consumption of tapeworm eggs.

Diphyllobothriasis—Parasitic infection caused by the presence of tapeworms from the *Diphyllobothrium* genus, such as the fish tapeworm (*Diphyllobothrium latum*).

Hymenolepiasis—Parasitic infection caused by the presence of tapeworms from the *Hymenolepis* genus, such as the dwarf tapeworm (*Hymenolepis nana*) or the rodent tapeworm (*Hymenolepis diminuta*).

Neurocysticercosis—Parasitic infection caused by the presence of immature tapeworm larvae within the central nervous system.

Pernicious anemia—Type of anemia caused by a deficiency in vitamin B₁₂.

Taeniasis—Parasitic infection caused by the presence of tapeworms from the *Taenia* genus, such as the pork tapeworm (*Taenia solium*) or the beef tapeworm (*Taenia saginata*).

Treatment

Effective treatment of tapeworm infections involves administering compounds that are toxic to the adult worm. Many of the early treatments were also somewhat toxic to the patient, so treatment was often quite an ordeal. Newer medications are much more easily tolerated and are highly effective in eliminating the parasite from the body.

One treatment that has been in use since the early 1960s is niclosamide (Niclocide). This drug is poorly absorbed from the digestive tract and rapidly kills tapeworms upon exposure. It has been shown to be effective against *Taenia* species and the fish tapeworm, but treatment of the dwarf tapeworm (*Hymenolepis nana*) may require a more prolonged treatment schedule. Side effects reported with niclosamide are infrequent and typically mild. When present, side effects may include nausea, abdominal discomfort, vomiting, diarrhea, light-

headedness, and skin rash. This medication should be taken in the morning on an empty stomach. The tablets are chewed thoroughly and swallowed with water. For young children, the tablets may be pulverized and mixed with water. Patients are allowed to eat two hours after treatment. Recommended dosage is 2 grams for adults and about half this for children.

Another oral medication that has been shown to be 95% effective in the treatment of tapeworm infections associated with both *Taenia* and *Diphyllobothrium latum* species is praziquantel (Biltricide). Side effects reported for praziquantel are mild and appear to be short-lived. They include nausea, abdominal pain, **itching**, sore joints, and muscle pain.

It is recommended that follow-up stool samples be examined at one month and three months after treatment has been completed. Treatment can be considered successful if no eggs are present in several stool samples. It should be noted that the tapeworm medications do not kill the tapeworm eggs when they kill the adult worm, so the potential for infection with eggs still exists as the dead worm segments are passed. Proper personal hygiene in individuals receiving treatment will greatly reduce this potential.

Cases of neurocysticercosis, where larvae have developed in the central nervous system, may also be treated with praziquantel or albendazole. If the patient is treated promptly, damage to the central nervous system will be minimized.

Prognosis

When confined to the intestinal tract, tapeworms cause minimal damage to their human host. Once the diagnosis of an intestinal tapeworm infection has been made, prognosis following treatment with niclosamide or praziquantel is good. The worms can be eliminated from the intestines with oral treatment, and there are usually no residual side effects. Serious problems from tapeworm infections occur when tapeworm eggs are consumed and the larvae localize in tissues outside the digestive tract (cysticercosis). Prompt diagnosis and treatment of this condition is necessary to prevent permanent damage to the central nervous system and other internal organs. Untreated cases of cysticercosis have the rare potential to be life-threatening.

Prevention

The best way to prevent infection with tapeworms is to eliminate the exposure of livestock to the tapeworm eggs by properly disposing of human feces. The next best strategy is to thoroughly cook or freeze all meat and fish before it is eaten to prevent consumption

of live tapeworm larvae in infected samples. Larval cysts in pork and beef are killed by moderate temperatures of 150°F (65°C) or if frozen for at least 12 hours. Proper cooking of freshwater fish could also eliminate the possibility of human infection with the fish tapeworm. Freezing fresh fish for 24 hours will also kill the larval form.

Resources

PERIODICALS

- Despommier, Dickson D. "Tapeworm Infection: The Long and the Short of It." *New England Journal of Medicine* 327 (3 Sept. 1992): 727-728.
- Pearson, Richard D., and Erik L. Hewlett. "Niclosamide Therapy for Tapeworm Infections." *Annals of Internal Medicine* 102 (Apr. 1985): 550-551.
- Schantz, Peter M. "Tapeworms (Cestodiasis)." *Gastroenterology Clinics of North America* 25 (Sept. 1996): 637-653.
- Schantz, Peter M., et al. "Neurocysticercosis in an Orthodox Jewish Community in New York City." *New England Journal of Medicine* 327 (3 Sept. 1992): 692-695.
- Tanowitz, Herbert B., Louis M. Weiss and Murray Wittner. "Diagnosis and Treatment of Intestinal Helminths: Common Intestinal Cestodes." *The Gastroenterologist* 1 (Dec. 1993): 265-273.

Geoffrey N. Clark, DVM

Tardive dyskinesia

Definition

Tardive dyskinesia is a mostly irreversible neurological disorder of involuntary movements caused by long-term use of antipsychotic or neuroleptic drugs.

Description

Antipsychotic or neuroleptic drugs are powerful tranquilizers generally prescribed for serious psychiatric disorders, as well as neurological and gastrointestinal disorders. Some common antipsychotics are: chlorpromazine HCl (Thorazine), thioridazine HCl (Mellaril), haloperidol (Haldol), perphenazine (Trilafon), thiothixene (Navane), trifluoperazine HCl (Stelazine), and fluphenazine HCl (Permitil, Prolixin).

When these drugs are used long term, tardive dyskinesia (TD) can result. About 20 percent of people taking **antipsychotic drugs** for more than one year become affected by TD. The prevalence of TD tends to be highest among elderly patients and among women.

Causes and symptoms

TD usually appears after years of antipsychotic drug use, and seems to be related to the total lifetime dose of medication. The symptoms include the following:

- tongue protrusion
- grimacing
- rapid eye blinking
- lip smacking, pursing, or puckering
- rapid movement of the arms or legs
- other involuntary movements of the head, face, neck and tongue muscles

Diagnosis

The diagnosis of TD is suspected upon observation of involuntary movements of the head, neck, face, and tongue in individuals who have a history of antipsychotic drug prescription.

Treatment

There is no standard treatment for TD. The primary approach is to discontinue or minimize the use of antipsychotic drugs while attempting to treat some of the symptoms. The treatment must be individualized to the patient, because discontinuation of the antipsychotic drug(s) may not be advisable, depending on the patient's condition. In some cases, substituting another drug for the antipsychotic drug may be beneficial.

Prognosis

Once TD appears in full-blown form, it can be permanent. With careful management, some symptoms may improve and even disappear with time. In less severe cases, some patients may recover from TD within three months of discontinuing the use of antipsychotic medication. Studies report that at least half of patients experience remission of major symptoms within 12 to 18 months following discontinuation of antipsychotic drugs. In some patients, however, decreasing the dose of the antipsychotic drug actually increases the symptoms of TD, while increasing the dose sometimes offers a temporary remission of the symptoms.

Prevention

TD can be prevented by early recognition and discontinuation of the antipsychotic medication if this is clinically possible. The use of antipsychotic drugs should in any case be kept to a minimum in all patients. Patients should be followed carefully to determine when

KEY TERMS

Antipsychotics—Drugs used to treat psychotic conditions such as schizophrenia or psychosis. These medications are powerful tranquilizers that all have sedating and calming effects, but their major effect is to reduce psychotic thinking and behavior.

Neuroleptics—Any of a class of drugs used to treat psychotic conditions.

Psychosis—A condition where a person's ability to recognize reality and cope with everyday life is severely affected.

the dose of the drug can be tapered off as the psychiatric condition improves. In all cases, the benefits of taking the antipsychotic medication should outweigh the risk of developing TD.

A study has shown that elderly institutionalized patients with **dementia** that were treated with risperidone had a low incidence of TD. Although further study is needed, this study shows that non-conventional neuroleptic drugs should be considered to avoid the risk of tardive dyskinesia, particularly in elderly patients.

Resources

BOOKS

Tasman, Allan. *Psychiatry*. Philadelphia: W.B. Saunders Company, 1997.

Tierney, Lawrence, et al. *Current Medical Diagnosis and Treatment*. Los Altos: Lange Medical Publications, 2001.

PERIODICALS

"Risperidone May Lower Incidence of TD." *Brown University geroPsych Report* (August 2000):2.

ORGANIZATIONS

National Institute for Mental Health. 6001 Executive Blvd., Room 8184, MSC 9663, Bethesda, MD 20892-9663.
<http://www.nimh.nih.gov>.

Tardive Dyskinesia/Tardive Dystonia National Association. P.O. Box 45732, Seattle, WA 98145-0732. (206) 522-3166.

Tarsorrhaphy

Definition

Tarsorrhaphy is a rare procedure where the eyelids are partially sewn together to narrow the opening.

Purpose

The eye needs a lid to protect it. It also needs tears and periodic blinking to cleanse it and keep it moist. There are many conditions that impair these functions and threaten the eye, specifically the cornea, with drying. Until they can be corrected, sewing the eyelids partially together helps protect the eye.

A partial list of the conditions that can require tarsorrhaphy includes:

- Paralysis or weakness of the eyelids so that they cannot close or blink adequately. **Bell's palsy** is a nerve condition that weakens the muscles of the face, including the eyelids. It is usually temporary. **Myasthenia gravis** also weakens facial muscles, but it is usually treatable. A **stroke** can also weaken eyelids so they do not close.
- Exophthalmos (the eyes sticking out of their sockets) occurs with Graves' disease of the thyroid and with tumors behind the eyes. If the eyes stick out too far, the lids cannot close over them.
- Enophthalmos is a condition in which the eye falls back into the socket so that the eyelid function is inadequate.
- Several eye and corneal diseases cause swelling of the cornea and require temporary added protection until the condition resolves.
- Sjögren's syndrome reduces tear flow to the point where it can endanger the cornea.
- Dendritic ulcers of the cornea caused by viruses may need to be covered with the eyelid while they heal.

Precautions

The use of eye drops and contact lenses to moisten and protect the eyes must be considered first before tarsorrhaphy is performed.

Description

Stitches are carefully placed at the corners of the eyelid opening (called the palpebral fissure) to narrow it. This allows the eye better lubrication and less exposure to the air. Eyeball motion can then help bathe the cornea in tears when it rolls up under the lid. The outpatient procedure is done under local anesthetic.

Preparation

Tarsorrhaphy is a minor procedure done under local anesthesia. Special preparation is not necessary.

Aftercare

Eye drops or ointment may still be needed to preserve the cornea or treat accompanying disease.

KEY TERMS

Cornea—The clear part of the front of the eye through which vision occurs.

Exophthalmos—A condition in which the eye falls back into the socket and inhibits proper eyelid function.

Exophthalmos—A condition in which the eyes stick out of their sockets and inhibit proper eyelid function.

Palpebral fissure—Eyelid opening.

Sjögren's syndrome—A connective tissue disease that hinders the production of tears and other body fluids.

Risks

Tarsorrhaphy carries few risks. If complications occur, they are usually minor eyelid swelling and superficial infection.

Resources

BOOKS

Sardegna, Jill Otis, and T. Paul. *The Encyclopedia of Blindness and Vision Impairment*. New York: Facts on File Inc., 1990.

J. Ricker Polsdorfer, MD

Tattoos see **Piercing and tattoos**

Tay-Sachs disease

Definition

Tay-Sachs disease is a genetic disorder caused by a missing enzyme that results in the accumulation of a fatty substance in the nervous system. This results in disability and **death**.

Description

Gangliosides are fatty substances necessary for the proper development of the brain and nerve cells (nervous system). Under normal conditions, gangliosides are continuously broken down, so that an appropriate balance is maintained. In Tay-Sachs disease, the enzyme necessary for removing excess gangliosides is missing. This allows

gangliosides to accumulate throughout the brain, and is responsible for the disability associated with the disease.

Tay-Sachs disease is particularly common among Jewish people of Eastern European and Russian (Ashkenazi) origin. About one out of every 3,600 babies born to Ashkenazi Jewish couples will have the disease. Tay-Sachs is also more common among certain French-Canadian and Cajun French families.

Causes and symptoms

Tay-Sachs is caused by a defective gene. Genes are located on chromosomes, and serve to direct specific development/processes within the body. The genetic defect in Tay-Sachs disease results in the lack of an enzyme called hexosaminidase A. Without this enzyme, gangliosides cannot be degraded. They build up within the brain, interfering with nerve functioning. Because Tay-Sachs is a recessive disorder, only people who receive two defective genes (one from the mother and one from the father) will actually have the disease. People who have only one defective gene and one normal gene are called carriers. They carry the defective gene and thus the possibility of passing the gene and/or the disease onto their offspring.

When a carrier and a non-carrier have children, none of their children will actually have Tay-Sachs. It is likely that 50% of their children will be carriers themselves. When two carriers have children, their children have a 25% chance of having normal genes, a 50% chance of being carriers of the defective gene, and a 25% chance of having two defective genes. The two defective genes cause the disease itself.

Classic Tay-Sachs disease strikes infants around the age of six months. Up until this age, the baby will appear to be developing normally. When Tay-Sachs begins to show itself, the baby will stop interacting with other people and develop a staring gaze. Normal levels of noise will startle the baby to an abnormal degree. By about one year of age, the baby will have very weak, floppy muscles, and may be completely blind. The head will be quite large. Patients also present with loss of peripheral (side) vision, inability to breath and swallow, and **paralysis** as the disorder progresses. Seizures become a problem between ages one and two, and the baby usually dies by about age four.

A few variations from this classical progression of Tay-Sachs disease are possible:

- Juvenile hexosaminidase A deficiency. Symptoms appear between ages two and five; the disease progresses more slowly, with death by about 15 years.
- Chronic hexosaminidase A deficiency. Symptoms may begin around age five, or may not occur until age

KEY TERMS

Ganglioside—A fatty (lipid) substance found within the brain and nerve cells.

20–30. The disease is milder. Speech becomes slurred. The individual may have difficulty walking due to weakness, muscle cramps, and decreased coordination of movements. Some individuals develop mental illness. Many have changes in intellect, hearing, or vision.

Diagnosis

Examination of the eyes of a child with Tay-Sachs disease will reveal a characteristic cherry-red spot at the back of the eye (in an area called the retina). Tests to determine the presence and quantity of hexosaminidase A can be performed on the blood, specially treated skin cells, or white blood cells. A carrier will have about half of the normal level of hexosaminidase A present, while a patient with the disease will have none.

Treatment

There is no treatment for Tay-Sachs disease.

Prognosis

Sadly, the prognosis for a child with classic Tay-Sachs disease is certain death. Because the chronic form of Tay-Sachs has been discovered recently, prognosis for this type of the disease is not completely known.

Prevention

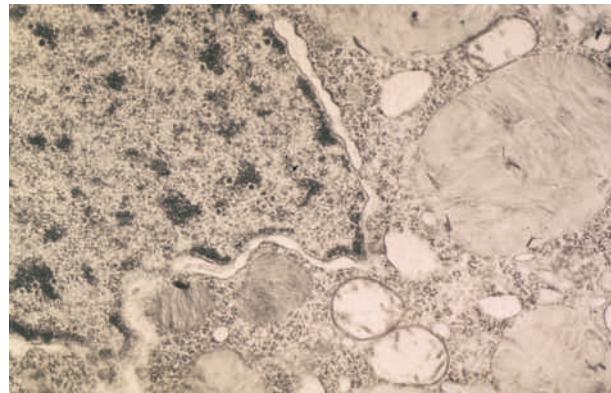
Prevention involves identifying carriers of the disease and providing them with appropriate information concerning the chance of their offspring having Tay-Sachs disease. When the levels of hexosaminidase A are half the normal level, a person is a carrier of the defective gene. Blood tests of carriers reveals reduction of hexosaminidase A.

When a woman is already pregnant, tests can be performed on either the cells of the baby (amniocentesis) or the placenta (chorionic villus sampling) to determine whether the baby will have Tay-Sachs disease.

Resources

BOOKS

Nelson Textbook of Pediatrics, edited by Richard Behrman. Philadelphia: W.B. Saunders, 1996.



Section of brain tissue from patient with Tay-Sachs disease. (Custom Medical Stock Photo. Reproduced by permission.)

PERIODICALS

Motulsky, Arno G. "Screening for Genetic Disease." *New England Journal of Medicine*, 336, no. 18 (May 1, 1997): 1314+.

Rosebush, Patricia I. "Late-Onset Tay-Sachs Disease Presenting as Catatonic Schizophrenia: Diagnostic and Treatment Issues." *Journal of the American Medical Association* 274, no. 22 (December 13, 1995): 1744.

ORGANIZATIONS

Late Onset Tay-Sachs Foundation. 1303 Paper Mill Road, Erdenheim, PA 19038. (800) 672-2022.

March of Dimes Birth Defects Foundation. National Office. 1275 Mamaroneck Avenue, White Plains, NY 10605. (888) 663-4637. <resourcecenter@modimes.org>. <<http://www.modimes.org>>.

National Tay-Sachs and Allied Diseases Association, Inc. 2001 Beacon Street, Suite 204, Brighton, MA 02146. (800) 906-8723. Fax: 617-277-0134. <NTSAD-Boston@worldnet.att.net>. <<http://www.ntsad.org>>.

Laith Farid Gulli, MD

TB see **Tuberculosis**

T-cell count see **Lymphocyte typing**

TCM see **Traditional Chinese medicine**

TE fistula see **Tracheoesophageal fistula**

Technetium heart scan

Definition

The technetium heart scan is a noninvasive nuclear scan that uses a radioactive isotope called technetium to evaluate blood flow after a **heart attack**.

Purpose

The technetium heart scan is used to evaluate the heart after a heart attack. It can confirm that a patient had a heart attack when the symptoms and **pain** usually associated with a heart attack were not present; identify the size and location of the heart attack; and provide information useful in determining the patient's post-heart attack prognosis. The scan is most useful when the electrocardiogram and cardiac enzyme studies do not provide definitive results—after heart surgery, for example, or when chest pain occurred more than 48 hours before the patient was examined. It is also used to evaluate the heart before and after heart surgery.

Precautions

Pregnant women and those who are breastfeeding should not be exposed to technetium.

Description

The technetium heart scan is a nuclear heart scan, which means that it involves the use of a radioactive isotope that targets the heart, and a radionuclide detector that traces the absorption of the radioactive isotope. The isotope is injected into a vein and absorbed by healthy tissue at a known rate during a certain time period. The radionuclide detector, in this case a gamma scintillation camera, picks up the gamma rays emitted by the isotope.

The technetium heart scan uses technetium Tc-99m stannous pyrophosphate (usually called technetium), a mildly radioactive isotope that binds to calcium. After a heart attack, tiny calcium deposits appear on diseased heart valves and damaged heart tissue. These deposits appear within 12 hours of the heart attack. They are generally seen two to three days after the heart attack and are usually gone within one to two weeks. In some patients, they can be seen for several months.

After the technetium is injected into a blood vessel in the arm, it accumulates in heart tissue that has been damaged, leaving "hot spots" that can be detected by the scintillation camera. The technetium heart scan provides better image quality than commonly used radioactive agents such as thallium, because it has a shorter half-life and can thus be given in larger doses.

During the test, the patient lies motionless on the test table. Electrocardiogram electrodes are placed on the patient's body for continuous monitoring during the test. The test table is rotated so that different views of the heart can be scanned. The camera, which looks like an x-ray machine and is suspended above the table, moves back and forth over the patient. It displays a series of

images of technetium's movement through the heart and records them on a computer for later analysis.

The test is usually performed at least 12 hours after a suspected heart attack, but it can also be done during triage of a patient who goes to a hospital emergency room with chest pain but does not appear to have had a heart attack. Recent clinical studies demonstrate that technetium heart scans are very accurate in detecting heart attacks while the patient is experiencing chest pain. They are far more accurate than electrocardiogram findings.

The technetium heart scan is usually performed in a hospital's nuclear medicine department but it can be done at the patient's bedside during a heart attack if the equipment is available. The scan is done two to three hours after the technetium is injected. Scans are usually done with the patient in several positions, with each scan taking 10 minutes. The entire test takes about 30 minutes to an hour. The scan is usually repeated over several weeks to determine if any further damage has been done to the heart. The test is also called technetium 99m pyrophosphate scintigraphy, hot-spot myocardial imaging, infarct avid imaging, or myocardial infarction scan.

The technetium heart scan is not dangerous. The technetium is completely gone from the body within a few days of the test. The scan itself exposes the patient to about the same amount of radiation as a **chest x ray**. The patient can resume normal activities immediately after the test.

Preparation

Two to three hours before the scan, technetium is injected into a vein in the patient's forearm.

Normal results

If the technetium heart scan is normal, no technetium will show up in the heart.

Abnormal results

In an abnormal technetium heart scan, hot spots reveal damage to the heart. The larger the hot spots, the poorer the patient's prognosis.

Resources

BOOKS

- DeBakey, Michael E., and Antonio M. Gotto Jr. "Noninvasive Diagnostic Procedures." In *The New Living Heart*. Holbrook, MA: Adams Media Corporation, 1997.
- Iskandrian, A. S., and Mario S. Verani. "Instrumentation and Technical Considerations in Planar and SPECT Imaging." In *Nuclear Cardiac Imaging: Principles and Applications*. 2nd ed. Philadelphia: F. A. Davis, 1996.

KEY TERMS

Electrocardiogram—A test in which electronic sensors called electrodes are placed on the body to record the heart's electrical activities.

Noninvasive—A procedure that does not penetrate the body.

Radioactive isotope—One of two or more atoms with the same number of protons but a different number of neutrons with a nuclear composition. In nuclear scanning, radioactive isotopes are used as a diagnostic agent.

Technetium—A radioactive isotope frequently used in radionuclide scanning of the heart and other organs. It is produced during nuclear fission reactions.

Sandler, M. P., et.al. "Radiopharmaceuticals." In *Diagnostic Nuclear Medicine*. 3rd ed. Vol. 1. Baltimore: Williams & Wilkins, 1996.

PERIODICALS

Kim, Samuel C., et. al. "Role of Nuclear Cardiology in the Evaluation of Acute Coronary Syndromes." *Annals of Emergency Medicine* 30, no. 2 (Aug. 1997): 210-218.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>. Texas Heart Institute. Heart Information Service. P.O. Box 20345, Houston, TX 77225-0345. <<http://www.tmc.edu/thi>>.

Lori De Milto

TEE see **Transesophageal echocardiography**

Template bleeding time see **Bleeding time**

Temporal arteritis

Definition

The term temporal arteritis literally means "inflammation of the temporal arteries." As implied by the name, these blood vessels run along the temples after they branch off from the carotid artery in the neck. They provide the blood supply to portions of the scalp, jaw muscles, and salivary glands. Inflammation of these arteries, probably resulting from an abnormal immune reaction,

disrupts this blood supply, resulting in a variety of symptoms. They can range from relatively minor—jaw pain or headache—through major—including temporary or permanent blindness.

Temporal arteritis is also called giant cell arteritis or cranial arteritis. It is a rheumatic disease that affects large and medium-sized arteries throughout the body and can occur in a variety of patients. Although the temporal arteries are most commonly affected, other arteries throughout the body may be affected. The disease seems to target arteries containing elastic tissue. Veins are rarely affected. Temporal arteritis is a type of **vasculitis**.

Description

Temporal arteritis almost always occurs in people over 50, and it becomes more common as people age. About 20 out of 100,000 people over the age of 50 suffer from temporal arteritis. Women are affected twice as often as men. Some authorities say that temporal arteritis is more common in Caucasians (especially Scandinavians) than in people of other races. Close relatives of patients with temporal arteritis may be more likely than others to get the disease.

Patients with temporal arteritis are diagnosed and overlap with a broader disorder called giant cell arteritis. This can affect parts of the body in addition to the scalp, eyes, and jaw. Sometimes the disease can cause restricted circulation to both arms or both legs, producing pain in the affected limbs. With other blood vessels involved, patients with advanced forms of the disease may experience strokes or transient ischemic attacks (TIA). These result in brief episodes of pain caused by decreased blood flow. Even heart attacks are occasionally caused by giant cell arteritis.

Causes and symptoms

This disease is one of a group of diseases in which the linings of large- or medium-sized blood vessels become inflamed. The elastic layer of these vessels is attacked by "giant" cells and chemicals produced by the immune system. This reaction reduces blood flow through the blood vessels, and the limited blood supply causes the symptoms.

The disease usually begins with "flu-like" symptoms, including a mild **fever** (100–101°F), general body discomfort, and a persistent, dull **headache**. The scalp may be tender to the touch over the affected blood vessels. Jaw muscles sometimes become painful when the patient chews.

As the disease progresses, more severe symptoms occur. These include blurred vision or temporary blindness that typically lasts ten minutes or less. Eventually, permanent loss of vision can occur. Transient ischemic

attacks, strokes, and heart attacks may occur when the disease is far advanced.

Diagnosis

Doctors from a number of specialties develop experience in diagnosing and treating temporal arteritis. These include internists, who treat a broad range of diseases; rheumatologists, who focus on rheumatic diseases; geriatricians, who treat older people; ophthalmologists, who treat eye and vision disorders; neurologists, who treat headaches and problems of the optic nerve; and vascular surgeons, who treat blood vessel problems.

The doctor will generally take a medical history first. The patient can help the doctor tremendously by reviewing all symptoms—both major and minor—from the last two or three months. If possible, the patient should ask family or close friends for help in recalling his/her ailments from recent months. Then the doctor will conduct a complete **physical examination**. Often, he or she will detect a tender, swollen artery on the scalp.

The doctor will order blood tests as well. A standard and inexpensive test called the **erythrocyte sedimentation rate** (ESR or “sed” rate) is particularly helpful. Results from this test, which measures inflammation in the body, will almost always be higher than normal. Tests of the red blood cells may show mild anemia. Sometimes blood tests for liver function will also be abnormal.

The definitive diagnostic test is a temporal artery biopsy. A doctor will make one or more tiny incisions under local anesthesia to remove samples of the suspect artery. Under the microscope, a pathologist usually can identify the typical damage caused by temporal arteritis.

Treatment

The mainstay of treatment is a course of **corticosteroids** (steroid hormones that have an anti-inflammatory effect), usually prednisone. The initial prescription involves a fairly high dose of steroids (40–60 mg/day) which is gradually tapered down to a maintenance dose. Because of the high incidence of blindness in untreated cases, steroid therapy should be started immediately rather than waiting for biopsy results. Patients typically take this maintenance dose for periods of one to three years. Sometimes **nonsteroidal anti-inflammatory drugs** (NSAIDs) are prescribed for muscle aches or headaches, especially while steroid doses are being reduced.

Prognosis

The outlook for most patients with temporal arteritis is good, especially if the disorder is diagnosed early. Symptoms often diminish within a month once patients begin to take steroids. Although physicians do not talk

KEY TERMS

Anemia—Lower than normal level of red blood cells, or of the oxygen-carrying chemical hemoglobin.

Biopsy—Removal and examination of a sample tissue from the body for diagnostic purposes.

Corticosteroids—A group of hormones, produced naturally by the adrenal gland and other organs. They are used to treat a wide variety of disorders, including many rheumatic disorders.

Erythrocyte sedimentation rate—The speed at which red blood cells sink in a tube of freshly drawn blood, which is a rough measure of clotting disorders or inflammation.

Prednisone—A corticosteroid often used to treat inflammation.

Rheumatic disease—A type of disease involving inflammation of muscles, joints, and other tissues.

Transient ischemic attack—A brief experience of stroke-like symptoms (for instance, numbness, paralysis, problems in speaking or understanding speech) that go away within hours, with no permanent damage. Also known as TIA.

Vasculitis—An inflammation of the blood vessels.

about a “cure” for temporal arteritis, symptoms typically do not return after a full course of steroid treatment. Unfortunately, if the diagnosis is made late in the disease, lost vision may not return.

Prevention

There is no medically proven approach to prevention. The best way to prevent severe, permanent damage is to obtain expert medical advice if the patient or the family physician suspects this problem.

Resources

BOOKS

Diamond, Seymour, and David Dalessio. *The Practicing Physician's Guide to Headache*. 5th ed. Baltimore: Williams & Wilkins, 1992.

PERIODICALS

Hayreh, S. S., et al. “Giant Cell Arteritis: Validity of Reliability of Various Diagnostic Criteria.” *American Journal of Ophthalmology* 123, no. 3 (1997): 285–296.

Perkins, A. T., and W. Ondo. “When to Worry About Headache.” *Postgraduate Medicine* 98, no. 2 (1995): 197–205.

ORGANIZATIONS

National Headache Foundation. 428 W. St. James Place, Chicago, IL 60614. (800) 843-2256. <<http://www.headaches.org>>.

Richard H. Lampert

Temporomandibular joint disorders

Definition

Temporomandibular joint disorder (TMJ) is the name given to a group of symptoms that cause **pain** in the head, face, and jaw. The symptoms include headaches, soreness in the chewing muscles, and clicking or stiffness of the joints. They often have psychological as well as physical causes.

Description

TMJ disorder, which is also sometimes called TMJ syndrome, results from pressure on the facial nerves due to muscle tension or abnormalities of the bones in the area of the hinge joint between the lower jaw and the temporal bone. This hinge joint is called the temporomandibular joint. There are two temporomandibular joints, one on each side of the skull just in front of the ear. The name of the joint comes from the two bones that make it up. The temporal bone is the name of the section of the skull bones where the jaw bone (the mandible) is connected. The jaw bone is held in place by a combination of ligaments, tendons, and muscles. The temporomandibular joint also contains a piece of cartilage called a disc, which keeps the temporal bone and the jaw bone from rubbing against each other. The jaw pivots at the joint area in front of the ear. The pivoting motion of the jaw is complicated because it can move downward and from side to side as well as forward. Anything that causes a change in shape or functioning of the temporomandibular joint will cause pain and other symptoms.

Causes and symptoms

Causes

TMJ syndrome has several possible physical causes:

- Muscle tension. Muscle tightness in the temporomandibular joint usually results from overuse of muscles. This overuse in turn is often associated with psychological stress and clenching or grinding of the teeth (**bruxism**).
- Injury. A direct blow to the jaw or the side of the head can result in bone fracture, soft tissue bruising, or a dislocation of the temporomandibular joint itself.
- Arthritis. Both **osteoarthritis** and **rheumatoid arthritis** can cause TMJ.

• Internal derangement. Internal derangement is a condition in which the cartilage disk lies in front of its proper position. In most cases of internal derangement, the disc moves in and out of its correct location, making a clicking or popping noise as it moves. In a few cases, the disc is permanently out of position, and the patient's range of motion in the jaw is limited.

• Hypermobility. Hypermobility is a condition in which the ligaments that hold the jaw in place are too loose and the jaw tends to slip out of its socket.

• Birth abnormalities. These are the least frequent cause of TMJ but do occur in a minority of patients. In some cases, the top of the jawbone is too small; in others, the top of the jawbone outgrows the lower part.

Symptoms

The symptoms of TMJ depend in part on its cause. The most common symptoms are facial pain in front of the ears; headaches; sore jaw muscles; a clicking sound when chewing; a grating sensation when opening and closing the mouth; and temporary locking of the jaw. Some patients also report a sensation of buzzing or ringing in the ears. Usually, the temporomandibular joint itself is not painful. Most cases of TMJ are seen in women between 20-50 years of age.

Diagnosis

Dental examination and patient history

TMJ disorders are most frequently diagnosed by dentists. The dentist can often diagnose TMJ based on **physical examination** of the patient's face and jaw. The examination might include pressing on (palpating) the jaw muscles for soreness or asking the patient to open and close the jaw in order to check for misalignment of the teeth in the upper and lower jaw. This condition is called **malocclusion**. The dentist might also gently move the patient's jaw in order to check for loose ligaments.

Imaging studies

Imaging studies are not usually necessary to diagnose TMJ. In most cases, x rays and MRI scans of the temporomandibular joint will be normal. Consequently, these two tests are not commonly used to diagnose TMJ. If the dentist suspects that the patient has internal derangement of the disc, he or she can use a technique called **arthrography** to make the diagnosis. In an arthrogram, a special dye is injected into the joint, which is then x-rayed. Arthrography can be used to evaluate the movement of the jaw and the disc as well as size and shape, and to evaluate the effectiveness of treatment for TMJ.

KEY TERMS

Arthrography—An imaging technique that is sometimes used to evaluate TMJ associated with internal derangement.

Bruxism—Habitual clenching and grinding of the teeth, especially during sleep.

Electromyographic biofeedback—A method for relieving jaw tightness by monitoring the patient's attempts to relax the muscle while the patient watches a gauge. The patient gradually learns to control the degree of muscle relaxation.

Internal derangement—A condition in which the cartilage disc in the temporomandibular joint lies in front of its proper position.

Malocclusion—The misalignment of opposing teeth in the upper and lower jaws.

Mandible—The medical name for the lower jaw.

Osteoarthritis—A type of arthritis marked by chronic degeneration of the cartilage of the joints, leading to pain and sometimes loss of function.

Rheumatoid arthritis—A chronic autoimmune disorder marked by inflammation and deformity of the affected joints.

Temporal bones—The compound bones that form the left and right sides of the skull.

Transcutaneous electrical nerve stimulation—A method for relieving the muscle pain of TMJ by stimulating nerve endings that do not transmit pain. It is thought that this stimulation blocks impulses from nerve endings that do transmit pain.

Treatment

In many cases, the cause of pain in the TMJ area is temporary and disappears without treatment. About 80% of patients with TMJ will improve in six months without medications or physical treatments.

Medications

Patients with TMJ can be given **muscle relaxants** if their symptoms are related to muscle tension. Some patients may be given **aspirin** or **nonsteroidal anti-inflammatory drugs** (NSAIDs) for minor discomfort. If the TMJ is related to rheumatoid arthritis, it may be treated with **corticosteroids**, methotrexate (MTX, Rheumatrex) or gold sodium (Myochrysine).

Physical therapy and mechanical devices

Patients who have difficulty with bruxism are usually treated with splints. A plastic splint called a night-guard is given to the patient to place over the teeth before going to bed. Splints can also be used to treat some cases of internal derangement by holding the jaw forward and keeping the disc in place until the ligaments tighten. The splint is adjusted over a period of two to four months.

TMJ can also be treated with ultrasound, electromyographic **biofeedback**, stretching exercises, transcutaneous **electrical nerve stimulation**, stress management techniques, or friction massage.

Surgery

Surgery is ordinarily used only to treat TMJ caused by birth deformities or certain forms of internal derangement caused by misshapen discs.

Prognosis

The prognosis for recovery from TMJ is excellent for almost all patients. Most patients do not need any form of long-term treatment. Surgical procedures to treat TMJ are quite successful. In the case of patients with TMJ caused by arthritis or infectious diseases, the progression of the arthritis or the success of eliminating infectious agents determines whether TMJ can be eliminated.

Resources

BOOKS

"Disorders of the Temporomandibular Joint." In *Merck Manual of Medical Information: Home Edition*, ed. Robert Berkow, et al. Whitehouse Station, NJ: Merck Research Laboratories, 1997.

Murphy Jr., William A., and Phoebe A. Kaplan, "Temporomandibular Joint." In *Diagnosis of Bone and Joint Disorders*, ed. Donald Resnick. Philadelphia: W. B. Saunders Co., 1995.

John T. Lohr, PhD

TEN see **Toxic epidermal necrolysis**

Tendinitis

Definition

Tendinitis is the inflammation of a tendon, a tough rope-like tissue that connects muscle to bone.

Description

Tendinitis usually occurs in individuals in middle or old age because it is often the result of overuse over a

long period of time. Tendinitis does occur in younger patients as a result of acute overuse.

Tendons that commonly become inflamed include:

- tendons of the hand
- tendons of the upper arm that effect the shoulder
- achilles tendon and the tendon that runs across the top of the foot

Causes and symptoms

Sudden stretching or repeated overuse injures the connection between the tendon and its bone or muscle. The injury is largely mechanical, but when it appears, the body tries to heal it by initiating inflammation. Inflammation increases the blood supply, bringing nutrients to the damaged tissues along with immunogenic agents to combat infection. The result is swelling, tenderness, **pain**, heat, and redness if the inflammation is close to the skin.

Diagnosis

Some tendon injuries are superficial and easy to identify. These include “tennis elbow” (extensor tendinitis) over the outside of the elbow, and Achilles’ tendinitis just above the heel of the foot. There are several tendons in the shoulder that can be overused or stretched, and usually a shoulder will have more than one injury at a time. Tendinitis in the biceps, the infraspinatus, or the supraspinatus tendon may accompany a tear of the shoulder ligaments or an impingement of one bone on another. Careful pressure testing and movement of the parts is all that is necessary to identify the tendinitis.

Treatment

Rest, ice, compression, and elevation (RICE) will treat the acute condition. The best way to apply ice is in a bag with water. The water applies the cold directly to the skin. Chemical ice packs can get too cold and cause frostbite. Compression using an elastic wrap minimizes swelling and bleeding in an acute sprain. Splinting may help rest the limb. Pain and anti-inflammatory medications (**aspirin**, naproxen, ibuprofen) will help. Sometimes the inflammation lingers and requires additional treatment. Injections of cortisone-like medicine often relieve chronic tendinitis, but should be reserved for resistant cases since cortisone can occasionally cause problems of its own.

If tendinitis is persistent and unresponsive to nonsurgical treatment, a surgery to remove the afflicted portion of tendon can be performed. Surgery is also conducted to remove calcium buildup that comes with persistent tendinitis.

KEY TERMS

Biceps—The muscle in the front of the upper arm.

Infraspinatus—A muscle at the middle of the shoulder blade.

Supraspinatus—A muscle at the top of the shoulder blade.

Alternative treatment

An osteopathic soft-tissue treatment on the tendon may relieve pain and increase mobility. Increasing intake of antioxidant-rich foods and lowering intake of animal fats may help reduce the inflammation. **Acupuncture** has also been used to combat tendinitis. Hydrotherapies, such as whirlpool baths, help relax the surrounding muscles.

Prognosis

Generally, tendinitis will heal if the provoking activity is stopped.

Prevention

If given enough time, tendons will strengthen to meet the demands placed on them. They grow slowly because of their poor blood supply, so adequate time is required for good conditioning.

Resources

BOOKS

Boulware, Dennis W. “The Painful Shoulder.” In *Cecil Textbook of Medicine*, ed. J. Claude Bennett and Fred Plum. Philadelphia: W. B. Saunders Co., 1996.

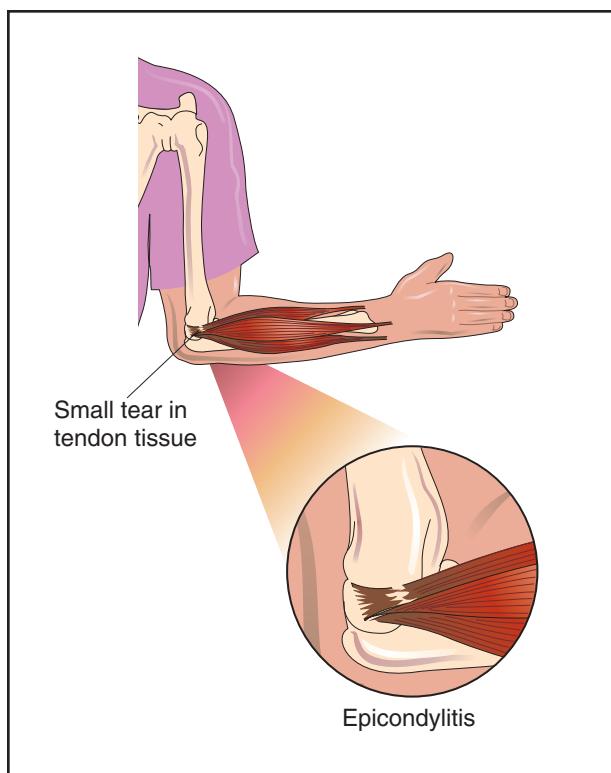
Gilliland, Bruce C. “Relapsing Polychondritis and Other Arthropathies.” In *Harrison’s Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

J. Ricker Polsdorfer, MD

Tennis elbow

Definition

Tennis elbow is an inflammation of several structures of the elbow. These include muscles, tendons, bursa, periosteum, and epicondyle (bony projections on the outside and inside of the elbow, where muscles of the forearm attach to the bone of the upper arm).



The classic tennis elbow is caused by repeated forceful contractions of wrist muscles located on the outer forearm. The stress created at a common muscle origin causes microscopic tears leading to inflammation. Persons who are most at risk of developing tennis elbow are those whose occupations require strenuous or repetitive forearm movement. (Illustration by Electronic Illustrators Group.)

Description

The classic tennis elbow is caused by repeated forceful contractions of wrist muscles located on the outer forearm. The **stress**, created at a common muscle origin, causes microscopic tears leading to inflammation. This is a relatively small surface area located at the outer portion of the elbow (the lateral epicondyle). Medial tennis elbow, or medial epicondylitis, is caused by forceful, repetitive contractions from muscles located on the inside of the forearm. All of the forearm muscles are involved in tennis serves, when combined motions of the elbow and wrist are employed. This overuse injury is common between ages 20 and 40.

People at risk for tennis elbow are those in occupations that require strenuous or repetitive forearm movement. Such jobs include mechanics or carpentry. Sport activities that require individuals to twist the hand, wrist, and forearm, such as tennis, throwing a ball, bowling, golfing, and skiing, can cause tennis elbow. Individuals in poor physical condition, who are exposed to repetitive

wrist and forearm movements for long periods of time may be prone to tennis elbow. This condition is also called epicondylitis, lateral epicondylitis, medial epicondylitis, or golfer's elbow, where **pain** is present at the inside epicondyle.

Causes and symptoms

Tennis elbow pain originates from a partial tear of the tendon and the attached covering of the bone. It is caused by chronic stress on tissues attaching forearm muscles to the elbow area. Individuals experiencing tennis elbow may complain of pain and tenderness over either of the two epicondyles. This pain increases with gripping or rotation of the wrist and forearm. If the condition becomes long-standing and chronic, a decrease in grip strength can develop.

Diagnosis

Diagnosis of tennis elbow includes the individual observation and recall of symptoms, a thorough medical history, and **physical examination** by a physician. Diagnostic testing is usually not necessary unless there may be evidence of nerve involvement from underlying causes. X rays are usually always negative because the condition primarily affects soft tissue, in contrast to a bony disorder.

Treatment

Conservative

Heat or ice is helpful in relieving tennis elbow pain. Once acute symptoms have subsided, **heat treatments** are used to increase blood circulation and promote healing. The physician may recommend physical therapy to apply diathermy or ultrasound to the inflamed site. These are two common modalities used to increase the temperature of the tissues in order to address both pain and inflammation. Occasionally, a tennis elbow splint may be useful to help decrease stress on the elbow throughout daily activities. Exercises become very important to improve flexibility to all forearm muscles, and will aid in decreasing muscle and tendon tightness that has been creating excessive pull at the common attachment of the epicondyle. The physician may also prescribe **nonsteroidal anti-inflammatory drugs** (NSAIDS) to reduce inflammation and pain. Injections of cortisone or anesthetics are often used if physical therapy is ineffective. Cortisone reduces inflammation, and anesthetics temporarily relieve pain. Physicians are cautious regarding excessive number of injections as they have recently been found to weaken the tendon's integrity.

KEY TERMS

Epicondyle—A projection on the surface of a bone; often an area for muscle and tendon attachment.

Epicondylitis—A painful and sometimes disabling inflammation of the muscle and surrounding tissues of the elbow caused by repeated stress and strain on the forearm near the lateral epicondyle of the humerus (arm bone).

Periosteum—A fibrous vascular membrane that covers bones.

Surgery

If conservative methods of treatment fail, surgical release of the tendon at the epicondyle may be a necessary form of treatment. However, surgical intervention is relatively rare.

Alternative treatment

Massage therapy has been found to be beneficial if symptoms are mild. Massage techniques are based primarily on increasing circulation to promote efficient reduction of inflammation. Manipulation, **acupuncture**, and **acupressure** have been used as well. Contrast **hydrotherapy** (alternating hot and cold water or compresses, three minutes hot, 30 seconds cold, repeated three times, always ending with cold) applied to the elbow can help bring nutrient-rich blood to the joint and carry away waste products. Botanical medicine and **homeopathy** may also be effective therapies for tennis elbow. For example, cayenne (*Capsicum frutescens*) ointment or prickly ash (*Zanthoxylum americanum*) oil applied topically may help to increase blood flow to the affected area and speed healing.

Prognosis

Tennis elbow is usually curable; however, if symptoms become chronic, it is not uncommon for treatment to continue for three to six months.

Prevention

Until symptoms of pain and inflammation subside, activities requiring repetitive wrist and forearm motion should be avoided. Once pain decreases to the point that return to activity can begin, the playing of sports, such as tennis, for long periods should not occur until excellent condition returns. Many times, choosing a different size or type of tennis racquet may help. Frequent rest periods

are important despite what the wrist and forearm activity may be. Compliance with a stretching and strengthening program is very important in helping prevent recurring symptoms and exacerbation.

Resources

BOOKS

Hertling, Darlene, and Randolph M. Kessler. *Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods*. 2nd ed. Philadelphia: J. B. Lippincott Co., 1990.

Norkin, Cynthia C., and Pamela K. Levangie. *Joint Structure and Function: A Comprehensive Analysis*. Philadelphia: F. A. Davis Co., 1992.

ORGANIZATIONS

American College of Sports Medicine. P.O. Box 1440, Indianapolis, IN 46206-1440. (317) 637-9200. <<http://www.acsm.org>>.

Jeffrey P. Larson, RPT

TENS see **Electrical nerve stimulation**

Tensilon test

Definition

Tensilon is the trade name for edrophonium chloride. The Tensilon test is an injection of edrophonium chloride used to diagnosis **myasthenia gravis** (MG).

Purpose

Tensilon blocks the action of an enzyme, acetylcholinesterase, an important part of the system regulating neuromuscular transmission. To stimulate a muscle, a nerve cell (neuron) releases the chemical acetylcholine. To prevent prolonged muscle response to a single nerve signal, acetylcholine is broken down by acetylcholinesterase after the muscle is stimulated.

In myasthenia gravis, there are too few receptors for acetylcholine on the muscle. The acetylcholine is broken down before it can fully stimulate this reduced number of receptors, and, as a result, the muscle is weak. By blocking the action of acetylcholinesterase, Tensilon prolongs the muscle stimulation, and temporarily improves strength. Increased strength following an injection of Tensilon strongly suggests a diagnosis of MG. The Tensilon test is most effective when easily observed weakness is present, and is less useful for vague or fluctuating complaints.

KEY TERMS

Acetylcholine—a molecule released by neurons at the neuromuscular junction that causes muscle contraction.

Precautions

The Tensilon test may cause heart rhythm abnormalities, especially in those patients with preexisting conditions.

Description

The Tensilon test involves the intravenous injection of a small amount of Tensilon. The needle is left in place. If no adverse reaction is observed within 30 seconds, an additional volume is injected. Results are apparent within one minute.

Preparation

Before the test, the patient must stop taking all drugs that can inhibit acetylcholinesterase. The referring physician can advise on specific drugs the patient is taking.

Aftercare

The effects of Tensilon subside quickly, and are completely gone after 30-60 minutes. No aftercare is needed.

Risks

Atrial fibrillation and bradycardia are possible in sensitive individuals. The administering physician must have appropriate resuscitative equipment available.

Normal results

In a patient without MG, the Tensilon test will not produce an obvious increase in a previously weak muscle. Some subjective feelings of increased strength are possible but not significant.

Abnormal results

An obvious increase in strength in weakened muscles strongly suggests the diagnosis of myasthenia gravis. The effect comes on very rapidly, and fades within minutes.

Resources

ORGANIZATIONS

Myasthenia Gravis Foundation of America. 222 S. Riverside Plaza, Suite 1540, Chicago, IL 60606. (800) 541-5454. <<http://www.med.unc.edu>>.

Muscular Dystrophy Association. 3300 East Sunrise Drive, Tucson, AZ 85718. (800) 572-1717. <<http://www.mdausa.org>>.

Richard Robinson

Tension headache

Definition

This most common type of **headache** is caused by severe muscle contractions triggered by **stress** or exertion. It affects as many as 90% of adult Americans.

Description

While most American adults get a tension headache from time to time, women and people with more education are slightly more likely to suffer with them. People who are so anxious that they grind their teeth or hunch their shoulders may find that the physical strain in their body can be experienced as **pain** and tension in the muscles of the neck and scalp, producing almost constant pain.

Causes and symptoms

Tension headaches are caused by tightening in the muscles of the face, neck and scalp because of stress or poor posture. They can last for days or weeks and can cause pain of varying intensity. The tightening muscles cause more expansion and constriction of blood vessels, which can make head pain worse. Eyestrain caused by dealing with a large amount of paperwork or reading can cause a tension headache as well.

Many people report tension headache pain as a kind of steady ache (as opposed to a throb) that forms a tight band around the forehead, affecting both sides of the head. Tension headaches usually occur in the front of the head, although they also may appear at the top or the back of the skull.

Tension headaches often begin in late afternoon and can last for several hours; they can occur every day and last throughout most of the day. When this happens, the headache is called a chronic tension headache. Unlike migraines, tension headaches don't cause **nausea and vomiting**, sensitivity to light, or any kind of aura before the headache begins.

Diagnosis

Diagnosis of tension headaches is made from a medical history, discussion of symptoms, and elimination of other types of headaches or underlying disorders.

Very few headaches are the sign of a serious underlying medical problem. However, sufferers should call a physician at once if they:

- have more than three headaches a week
- take painkillers almost every day
- need more than the recommended dose of painkiller
- have a stiff neck and/or **fever** in addition to headache
- are dizzy, unsteady, or have slurred speech, weakness, or numbness
- have confusion or drowsiness with the headache
- have headaches that began with a head injury
- have headaches triggered by bending, coughing or exertion
- have headaches that keep getting worse
- have severe vomiting with the headache
- had the first headache after age 50
- awaken with headache that gets better as the day goes on

Treatment

There are many different treatments for tension headaches, which respond well to both medication and massage. If these headaches become chronic, however, they are best treated by identifying the source of tension and stress and reducing or eliminating it.

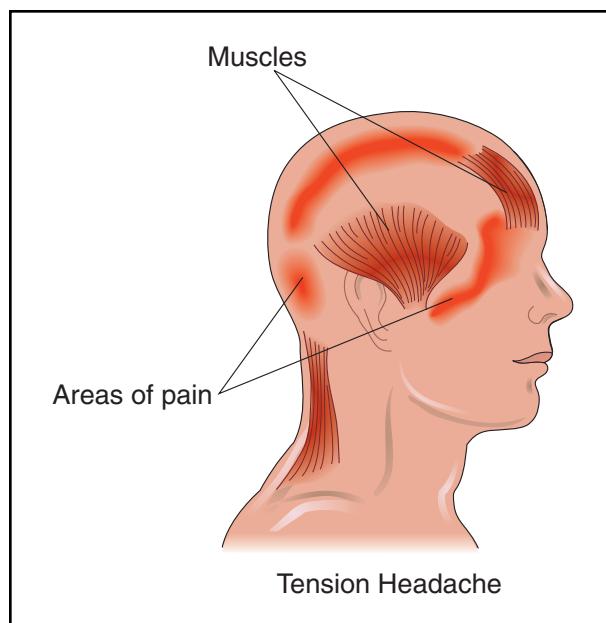
Medication

Tension headaches usually respond very well to such over-the-counter medicines as **aspirin**, ibuprofen, or **acetaminophen**. However, some of these drugs (especially those that contain **caffeine**) may trigger rebound headaches if discontinued after they are taken for more than a few days.

More severe tension headaches may require combination medications, including a mild sedative such as butalbital; these should be used sparingly, though. Chronic tension headaches may respond to low-dose amitriptyline taken at night.

Massage

Massaging the tense muscle groups may help ease pain. Instead of directly massaging the temple, patients will get more relief from rubbing the neck and shoulders, because tension headaches can arise from tension in this



Tension headache is the most common type of headache, caused by severe muscle contractions triggered by stress or exertion. Tension headaches usually occur in the front of the head, although they may also appear at the top or the back of the skull, as shown in the illustration above. (Illustration by Electronic Illustrators Group.)

area. In fact, relaxing the muscles of the neck can cut the intensity and duration of tension headaches at least in half.

To relax these muscles, the neck should be rotated from side to side as the shoulders shrug. Some people find that imagining a sense of warmth or heaviness in the neck muscles can help. Taking three very deep breaths at the first hint of tension can help prevent a headache.

Other therapy

If tension headaches are a symptom of either depression or **anxiety**, the underlying problem should be treated with counseling, medication, or a combination of both.

Alternative treatment

Eliminating the source of the tension as much as possible will help prevent tension headaches. **Acupuncture** may be helpful in treating some chronic tension headaches. Homeopathic remedies and botanical medicine can also help relieve tension headaches. Valerian (*Valeriana officinalis*), skullcap (*Scutellaria lateriflora*), and passionflower (*Passiflora incarnata*) are three herbal remedies that may be helpful. A tension headache can also be relieved by soaking the feet in hot water while an ice cold towel is wrapped around the neck.

Prognosis

Cutting down on stress and relying less on caffeine-containing medications can reduce the number of tension headaches for most people.

Prevention

Tension headaches can often be prevented by managing everyday stress and making some important lifestyle changes. Those who are prone to tension headaches should:

- take frequent “stress breaks”
- get regular exercise—even a brisk 15-minute walk can help prevent tension headaches
- get enough sleep
- release angry feelings

Resources

BOOKS

- Rapoport, Alan M., and Fred Sheftell. *Headache Relief for Women*. Boston: Little, Brown and Co., 1996.
 Robbins, Lawrence, and Susan S. Lang. *Headache Help*. New York: Houghton Mifflin, 1995.
 Solomon, Seymour, and Steven Fraccaro. *The Headache Book*. New York: Consumer Reports Books, 1991.

PERIODICALS

- Byfield, Ted. “Sock It to Headache Pain.” *Body Bulletin* (1 Feb. 1996): 3.
 Kleiman, Carol. “For Women, Success at Work Can Be a Tension Headache.” *St. Louis Post-Dispatch*, 2 Apr. 1998, C8.
 Munson, Marty, Therese Walsh, and Yun Lee. “On the Mark: Aim Low to Relieve Tension Headache.” *Prevention Magazine*, 1 Jan. 1996, 24-25.
 Rogers, June. “Your Aching Head.” *Chatelaine* 69 (1 Aug. 1996): 47-50.

ORGANIZATIONS

- American Council for Headache Education (ACHE). 19 Mantua Road, Mt. Royal, NJ 08061. (800) 255-2243. <<http://www.achenet.org>>.
 National Headache Foundation. 428 W. St. James Place, Chicago, IL 60614. (800) 843-2256. <<http://www.headaches.org>>.

Carol A. Turkington

Terazosin see **Alpha₁-adrenergic blockers**

Testicular cancer

Definition

Testicular cancer is a disease in which cancer cells are discovered in one or both testicles. The testicles, also

known as testes or gonads, are located in a pouch beneath the penis called the scrotum.

Description

The testicles make up one portion of the male reproductive system. Normally, they are each somewhat smaller than a golf ball in size and are contained within the scrotum. The testicles are a man’s primary source of male hormones, particularly testosterone. They also produce sperm.

There are several types of cells contained in the testicles, and any of these may develop into one or more types of cancer. Over 90% of all testicular cancers begin in cells called germ cells. There are two main types of germ cell tumors in men: seminomas and nonseminomas. Seminomas make up about 40% of all testicular germ cell tumors. Nonseminomas make up a group of cancers, which include **choriocarcinoma**, yolk sac tumors, embryonal carcinoma, and teratoma.

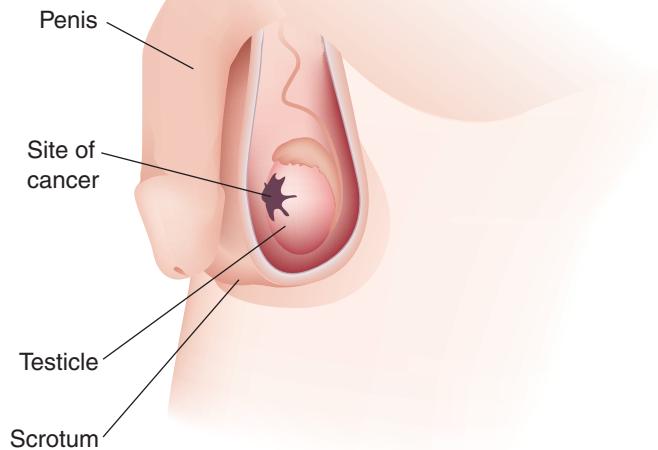
Although testicular cancer accounts for less than 2% of all cancers in men, it is the most commonly seen cancer in young men aged 15 to 35. It is also one of the most curable.

The American Cancer Society estimates that approximately 7,200 new cases of testicular cancer will be diagnosed in 2001. In addition, about 400 men will die of the disease during that year. Though the incidence of testicular cancer is rising, having doubled in the last 30 years, it is still rare. Scandinavian countries have the highest rate in the world. Germany and New Zealand also have high rates. The lowest incidences of testicular cancer are in Asia and Africa.

Causes and symptoms

The exact causes of testicular cancer are unknown. However, there is research showing that some men are more likely to acquire it than others. The risk for testicular cancer is much higher for boys born with one or both of their testicles located in the lower abdomen rather than in the scrotum. This condition is called cryptorchidism or undescended testicles. The lifetime risk of getting testicular cancer is four times higher for boys with cryptorchidism than the risk in the general population. This risk factor remains even if surgery is done to place the testicle back into the scrotum.

There are other risk factors as well. Men who have had abnormal development of their testicles are at increased risk, as are men with Klinefelter’s syndrome (a disorder of the sex chromosomes). A family history of testicular cancer increases the possibility of getting the disease. Men infected with the human **immunodeficiency virus** (HIV) are also at increased risk.



A cancerous growth on the testicle. (Illustration by Argosy Inc.)

cy virus (HIV), especially those with AIDS, have a higher incidence, as do infertile men. Certain testicular tumors appear more frequently among men who work in certain occupations, like miners, oil workers, and utility workers. There is no conclusive evidence that injuries to the testicles or environmental exposure to various chemicals cause the disease.

Testicular cancer usually shows no early symptoms. It is suspected when a mass or lump is felt in the testes, although a testicular mass does not always indicate cancer and is usually painless.

Symptoms:

- a lump in either testicle (usually pea-sized, but may be as large as a marble or an egg)
- any enlargement or significant shrinking of a testicle
- a sensation of heaviness in the scrotum
- a dull ache in the groin or lower abdomen
- any sudden collection of fluid in the scrotum
- tenderness or enlargement of the breasts
- pain or discomfort in a testicle or in the scrotum

Diagnosis

When a man exhibits symptoms that suggest a possibility of testicular cancer, several diagnostic steps will occur before a definitive diagnosis is made.

History and physical

The physician takes a personal and family medical history and a complete **physical examination** is performed. The doctor will examine the scrotum as well as the abdomen and other areas to check for additional masses.

Ultrasound

If a mass is found, the physician will likely have an ultrasound performed. Through the use of sound waves, ultrasounds can help visualize internal organs and may be useful in telling the difference between fluid-filled cysts and solid masses. If the tumor is solid, it is most likely cancerous.

Blood tests

Certain blood tests can be helpful in diagnosing some testicular tumors. **Tumor markers** are substances

often found in higher-than-normal amounts in cancer patients. Some testicular cancers secrete high levels of certain proteins such as alpha-fetoprotein (AFP), human chorionic gonadotropin (HCG), and enzymes like lactate dehydrogenase (LDH). These markers may help find a tumor that is too small to be felt during a physical examination. In addition, these tests are also helpful in determining how much cancer is actually present, and in evaluating the response to treatment to make sure the tumor has not returned.

Surgery

If a suspicious growth is found, a surgeon will need to remove the tumor and send it to the laboratory for testing. A pathologist examines the testicular tissue microscopically to determine whether cancer cells are present. If cancer cells are found, the pathologist sends back a report describing the type and extent of the cancer. In almost all cases, the surgeon removes the entire affected testicle through an incision in the groin, though not through the scrotum. This procedure is called radical inguinal orchectomy.

Once testicular cancer is determined, further tests are necessary to find out if the cancer has metastasized (spread) to other parts of the body, and to ascertain the stage or extent of the disease. This information helps the doctor plan appropriate treatment. These tests may include computed tomography (CT scan), **lymphangiography** (x rays of the lymph system), bone scans, and chest x rays.

Treatment

Staging

One method the cancer treatment team uses to describe the scope of a patient's cancer is the use of a staging system. Testicular cancer is classified using the TNM system. However, in order to simplify and summarize this information, the TNM description can be grouped according to stages.

Stages of testicular cancer:

- Stage I. This stage refers to a cancer found only in the testicle, with no spread to the lymph nodes or to distant organs.
- Stage II. This indicates that the cancer has spread to the lymph nodes in the abdomen, but not to lymph nodes in other parts of the body.
- Stage III. In this stage, the cancer has spread beyond the lymph nodes in the abdomen, and/or the cancer is in parts of the body far away from the testicles, such as the lungs or the liver.

- Recurrent. Recurrent disease indicates that the cancer has come back after it has already been treated. Testicular cancer can come back in the same testicle (if it was not surgically removed) or in some other body part.

Treatment

The treatment decisions for testicular cancer are dependent on the stage and cell type of the disease, as well as the patient's age and overall health. The four kinds of treatment most commonly used are surgery, **radiation therapy**, **chemotherapy**, and bone marrow or stem cell transplantation.

Surgery is normally the first line of treatment for testicular cancer and involves the removal of the affected testicle. This procedure is known as a radical inguinal orchectomy. Depending on the type and stage of the cancer, some lymph nodes may also be removed at the same time, or possibly in a second operation. This procedure is called a retroperitoneal lymph node dissection, and can be a major operation. Some patients will experience temporary complications after surgery, including infections and bowel obstruction. If both of the testicles are taken out, a man will have no ability to produce sperm cells and will become infertile (unable to father a child). Surgery removing the lymph nodes may cause some damage to nearby nerves, which may interfere with the ability to ejaculate. Men undergoing surgery for testicular cancer may wish to discuss nerve-sparing surgery with their doctor, as well as sperm banking.

Radiation therapy for testicular cancer is delivered from a machine and is known as external beam radiation. One potential problem with this type of radiation is that it can also destroy nearby healthy tissue as well as cancer cells. Other potential side effects include nausea, **diarrhea** and **fatigue**. A special device can be used to protect the unaffected testicle to preserve fertility.

Chemotherapy refers to the use of drugs in treating cancer. Since the drugs enter the bloodstream and circulate throughout the body, chemotherapy is considered a systemic treatment. The drugs primarily used in the treatment of testicular cancer are cisplatin, vinblastine, bleomycin, cyclophosphamide, etoposide, and ifosfamide. These drugs are given in various combinations, since the use of two or more drugs is considered more effective than using only one drug.

Since chemotherapy agents can affect normal as well as cancerous cells, several side effects are possible. These side effects include:

- **nausea and vomiting**
- changes in appetite
- hair loss (temporary)

- mouth sores
- increased risk of infections
- bleeding or bruising
- fatigue
- diarrhea or constipation

Several drugs are available to assist in treating these side effects, most of which will disappear after the treatment is completed. However, some of the chemotherapy agents used during treatment of testicular cancer may cause long-term side effects. These include **hearing loss**, nerve damage, and possible kidney or lung damage. Another potentially serious long-term complication is an increased risk of leukemia. This is a rare side effect, however, as it occurs in less than 1% of testicular cancer patients who receive chemotherapy. Chemotherapy may also interfere with sperm production. This may be permanent for some, but many will regain their fertility within a few years.

Studies are ongoing to determine whether high doses of chemotherapy combined with stem-cell transplantation will prove effective in treating some patients with advanced testicular cancer. In this treatment, blood-forming cells called stem cells are taken from the patient (either from the bone marrow or filtered out of the patient's blood). These cells are kept frozen while high-dose chemotherapy is administered. After receiving the chemotherapy, the patient is given the stem cells through an infusion. This treatment enables the use of extra large doses of chemotherapy that might increase the cure rate for some testicular cancers.

Preferred treatment plans by stage of disease

Stage I: Stage I seminomas are normally treated with a radical inguinal orchietomy followed by radiation treatment aimed at the lymph nodes. More than 95% of Stage I seminomas are cured through this method. Another approach is to perform surgery only. Patients are then followed closely for several years with blood tests and imaging studies. If the cancer spreads later on, radiation or chemotherapy can still be used. Stage I non-seminomas are also highly curable with surgery, followed by one of three options. These options include the performance of a retroperitoneal lymph node dissection, two cycles of chemotherapy, or careful observation for several years.

Stage II: Stage II seminomas and non-seminomas are cured in 90% to 95% of the cases. For the purposes of treatment, stage II testicular cancers are classified as either bulky or nonbulky. Nonbulky seminomas (no lymph nodes can be felt in the abdomen) are treated with an orchietomy followed by radiation to the lymph nodes. Men with bulky seminomas have surgery, which may be followed by either radiation or a course of

chemotherapy. Nonbulky Stage II non-seminomas are treated with surgery and lymph node removal, with possible chemotherapy. Men with bulky disease have surgery followed by chemotherapy.

Stage III: Stage III seminomas and non-seminomas are treated with surgery followed by chemotherapy. This produces a cure in about 70% of the cases. Those who are not cured may be eligible to participate in clinical trials of other chemotherapy agents.

Recurrent: Treatment of recurrent testicular cancer is dependent upon the initial stage and the treatment given. This might include further surgery and chemotherapy. Many men whose disease comes back after chemotherapy are treated with high-dose chemotherapy followed by bone marrow or stem cell transplantation.

Alternative treatment

There are currently no scientifically proven alternative treatments known for testicular cancer. Nothing has been shown to be as successful as conventional treatment. However, some patients may find certain alternative or complementary treatments supportive while undergoing surgery, chemotherapy or radiation. For example, **meditation** and relaxation exercises may prove effective in reducing nausea and vomiting. Some dietary modifications and nutritional supplements may be helpful in assisting with recovery after surgery. The testicular cancer patient considering alternative treatments should talk it over with members of the cancer care team. They may be able to offer additional information.

Prevention

The main risk factors associated with testicular cancer—cryptorchidism, family history of the disease, and being Caucasian—are unavoidable since they are present at birth. In addition, many men diagnosed with the disease have no known risk factors. Because of these reasons, it is not possible to prevent most incidences of testicular cancer.

Resources

BOOKS

Nichols, Craig R., et al. "Neoplasms of the Testis." In *Cancer Medicine*, 5th ed. Hamilton, Ontario: American Cancer Society, 2000.

PERIODICALS

"Curable Cancer: Testicular Malignancies are Easy to Find and Treat. But You Have to be Willing to Probe a Bit." *Time* 154 (September 6, 1999): 85.
 "Early Diagnosis is Key to Treatment." *USA Today Magazine* 129 (October 2000): 10.

KEY TERMS

Cryptorchidism—Occurs when a boy is born with one or both testicles in the lower abdomen rather than the scrotum. Known also as undescended testicles, it is the primary risk factor for testicular cancer.

Metastatic testicular cancer—Testicular cancer that has spread to other parts of the body.

Radical inguinal orchectomy—Surgical procedure performed to remove one or both testicles. It is done via a groin incision.

Testicles—Also called testes or gonads, they are part of the male reproductive system, and are located beneath the penis in the scrotum.

Kirchner, Jeffrey T. "Family History as a Risk Factor For Testicular Cancer." *American Family Physician* 57 (March 15, 1998): 1419.

"Testicular Cancer—What to Look For." *American Family Physician* (May 1, 1998): 1.

ORGANIZATIONS

American Cancer Society. (800) ACS-2345.

National Cancer Institute. Cancer Information Service. (800) 4-CANCER.

OTHER

American Cancer Society Cancer Resource Center. (June 19, 2001). <<http://www3.cancer.org/cancerinfo>>.

Beeson, Dr. Debra. "Commentary: Testicular Cancer Commonly Seen in Younger Men." *Cancer News* (April 12, 2000). (June 19, 2001) <http://www.ontumor.com/cancernews_sm/testicular041200.htm>.

National Cancer Institute CancerNet. (June 19, 2001). <<http://www.Cancernet.nci.nih.gov>>.

The Testicular Cancer Resource Center. (June 19, 2001). <<http://www.acor.org/TCRC>>.

Deanna Swartout-Corbeil, R.N.

Testicular scan see **Scrotal nuclear medicine scan**

Testicular self-examination

Definition

A testicular self-examination (TSE) is the procedure by which a man checks the appearance and consistency of his testes.

Purpose

Most testicular cancers are first noticed by the man himself. Men should do a TSE every month to find out if the testes contain any suspicious lumps or other irregularities, which could be signs of **cancer** or infection.

Precautions

None.

Description

A TSE should take place during a warm shower or bath, when the skin is warm, wet, and soapy. The man needs to step out of the tub so that he is in front of a mirror. The heat from the tub or shower will relax the scrotum (sac containing the testes) and the skin will be softer and thinner, making it easier to feel a lump. It is important that the exam be done very gently.

The man should stand facing his mirror and look for swelling on the scrotum. Using both hands, the scrotum should be gently lifted so that the area underneath can be checked.

The next step is the examination by hand. The index and middle fingers should be placed under each testicle, with the thumbs on top. The testes should be examined one at a time. The man should roll each testicle between his fingers and thumbs. He should feel for lumps of any size (even as small as a pea) particularly on the front or side of each testicle. He should also look for soreness or irregularities. Next, the epididymis and vas deferens, located on the top and back of the testes, should be felt. This area feels like a cord, and should not be tender.

Normal results

It is normal for one testicle to be larger than the other is, and for them to hang at different levels; but the size should stay the same from one month to the next. The testes should be free from lumps, **pain**, irregularities and swelling.

Abnormal results

A TSE is considered abnormal if any swelling, tenderness, lumps, or irregularities are found. Hard, unmoving lumps are abnormal, even if they are painless. A lump could be a sign of an infection or a cancerous tumor. A change in testicle size from one month to the next is also abnormal. A feeling of heaviness in the scrotum is another abnormal sign. If any abnormality is found, a man is encouraged to check with his doctor as soon as possible because **testicular cancer** is highly curable if found early.

KEY TERMS

- Epididymis**—A tube in the back of the testes that transports sperm.
- Scrotum**—The pouch containing the testes.
- Testes**—Egg-shaped male gonads located in the scrotum. Testes is the plural form of testis, which is a testicle.
- Vas deferens**—A tube that is a continuation of the epididymis. This tube transports sperm from the testis to the prostatic urethra.

Resources

BOOKS

- Hainsworth, John D., and F. Anthony Greco. "Testis." In *Cancer Treatment*, 5th ed. edited by Charles M. Haskell. Philadelphia: W.B. Saunders, 2001.
- Seidel, Henry M. et al. *Mosby's Guide to Physical Examination*, 4th ed. St. Louis: Mosby, Inc., 1999.

PERIODICALS

- Schaffner, Robert J. "Knowledge of Testicular Self-exam." *Nurse Practitioner* 20 (August 1995): 10-11.

OTHER

- "Questions and Answers About Testicular Cancer." Feb. 2000 *National Cancer Institute*. <http://cis.nci.nih.gov/fact/6_34.htm>.

Rhonda Cloos,, R.N.

Testicular sonogram see **Scrotal ultrasound**

Testicular surgery

Definition

Testicular surgery is any surgical operation on the testicles.

Purpose

Testicular surgery is used primarily to correct developmental defects, treat infection, and treat **cancer** of the testes.

Precautions

Testicular surgery, a group of surgical operations performed on the testicles, is considered major surgery.

In all cases, except when the testes are being removed, care must be taken not to damage any of the nerves and blood vessels supplying the testes and associated organs.

Description

Testicular surgery is commonly performed for the following reasons: to reposition **undescended testes** (orchiopexy); to correct **testicular torsion**; to treat **testicular cancer**, which may involve removal of the testicles (castration) or the testes (orchectomy); and to correct **intersex states**.

Undescended testes

Undescended testes are testes that have not dropped into the scrotum. During the fetal stage of development, the testes are not in the scrotum, but in the body. As male children age, the testes descend from the body to the scrotum for proper maturation and function. Undescended testes must be treated with surgery. There are two types of undescended testes, ectopic and cryptorchid. Ectopic testes are outside the normal route of descent. Cryptorchid testes are in the proper route of descent, but descent has been stopped before the testes reached the scrotum. The treatment for undescended testes is a surgical operation called orchiopexy, in which an incision allows the surgeon to reach the testes and pull them down into the scrotum. This operation is best done between the ages of one and two; otherwise, the testes are unlikely to mature normally. If the patient has one normal testis and one poorly developed testis, the undeveloped testis is usually removed.

Testicular torsion

Testicular torsion is a developmental defect in the tissues of the scrotum that allows the testes to rotate within the scrotum. This results in the blood vessels around other tubes in the scrotum to become wrapped around each other, resulting in blood supply to the testes being cut off. Torsion disease is seen in young boys. **Pain**, nausea, and scrotal swelling are the main symptoms. When torsion is suspected, immediate surgery is recommended. An incision is made in the scrotum, and the blood vessels and other tissues are untangled. During surgery, the testes are examined to determine their condition. If they have received enough blood to remain viable, the testes are surgically attached to scrotal tissue to prevent twisting from recurring. If the testes do not regain a healthy pink color after the blood vessels have been untangled, then it is best to remove the testes. The lack of a pink color indicates that the testes have been without blood for too long a time period, and are dead tissue. Unless removed, they will turn necrotic and cause further harm to the body. Usually, testicular torsion

occurs in only one testis. However, because the other testicle has similar anatomy, it too is subject to torsion. During surgery, the other testicle is attached to scrotal tissue to prevent torsion from occurring.

Cancer

Carcinoma of the testes is cancer in the testicles. For males between ages 20–35, carcinoma of the testes is the second most common cancer. It accounts for 1–2% of all cancers in all males. There are many kinds of cancer that can affect the testes. A mass of tissue that is suspected to be cancer should be removed surgically. It is recommended that a biopsy not be performed, but that the physician proceed directly to surgery. Biopsies have not proven to be better at diagnosing cancer of the testicles than exploratory surgery. If the presence of cancer is confirmed during exploratory surgery, surgical excision of the cancer can be performed immediately.

The approach to the cancer during the operation depends on the location of the tissue mass. The two main approaches are through the scrotum and through the groin (inguinal region). The amount of tissue removed is variable and depends on the amount of cancerous tissue and the location. However, if a solid lesion is confirmed within a testis, a radical orchiectomy should be performed. A radical orchiectomy is a complete removal of one or both testes and associated lymphatic tissue. Other tumors allow partial removal of a testis. After surgery, the tumor is examined to determine the type of tumor for use as a guide in followup therapy.

Castration is the surgical removal of the testicles. Castration is performed as a cancer therapy, to reduce the amount of testosterone being produced, and as part of treatment for **prostate cancer**. In castration, an incision is made through one or both sides of the scrotum, depending on whether one or both testicles are being removed.

Intersex states

Intersex states are a group of developmental diseases in which the patient has parts of both male and female genitalia. In testicular feminization syndrome, the patient appears to be a female and will have female genitalia but has internal testes. The internal testes are undescended. Genetic studies show that the person was to be a male. This form of intersex is also called male pseudohermaphroditism. There are a number of different causes of this condition. These patients produce the male hormone testosterone. Treatment consists of surgical removal of the internal testes, and the administration of the hormone estrogen, which produces female characteristics. Failure to remove the testes is associated with a higher rate of cancer in these patients.

KEY TERMS

Biopsy—Removing tissue to test it for disease.

Lesion—An injury in the body tissue, such as a wound, sore, rash, or boil.

Orchiectomy—Surgical removal of one or both testes.

Orchiopexy—Surgical fixation of one or both testes.

Testes—The pair of male reproductive glands enclosed in the scrotum that produce the male sex hormone testosterone and the spermatozoa. The singular form is testis.

Testicles—The testes along with their enclosing structures.

Preparation

About one hour before receiving general anesthesia, the patient will get a shot that dries up internal fluids and makes him sleepy. Presurgical counseling is often recommended for patients whose reproductive abilities will be compromised by their surgeries.

Aftercare

A patient who has had a testicle removed should visit his physician once a month for the first year and every other month for the second year, with periodic followups thereafter.

Risks

Testicular surgery, like any major surgery, can have postoperative complications. These complications include internal bleeding and wound infection, as well as adverse reactions to anesthesia.

Normal results

Undescended testes are pulled down into their correct position and mature normally. In testicular torsion, the affected testis either regains its healthy pink color and is attached to the surrounding tissue with sutures, or it is removed along with any dead tissue surrounding it. (So long as only one testis is removed, sexual function and fertility will not be affected.) Successful surgery for cancer results in the removal of malignant tissue.

Resources

BOOKS

- Bentz, M. L. *Pediatric Plastic Surgery*. Stamford: Appleton & Lange, 1998.
- Hurst, J. Willis. *Medicine for the Practicing Physician*. Stamford: Appleton & Lange, 1988.
- Sabiston, D. C., and H. K. Lyerly. *Essentials of Surgery*. Philadelphia: W. B. Saunders Co., 1994.

Testicular torsion

Definition

Testicular torsion is the twisting of a testis (testicle) on its connection.

Description

The testes are suspended in the scrotum by a single bundle of tissues that also carries the blood supply to and from the testes. If the testicle rotates, the bundle kinks, and the blood supply is shut off. The resulting situation is an emergency because the testis will die within hours if the blood supply is not restored.

Causes and symptoms

Some testes hang in such a way that they twist more easily than others. Nearly all torsions happen to adolescent males—between the ages of 12 and 18—because their testes enlarge by a factor of five to six during **puberty**. A larger testis is more likely to twist. Torsion can also occur in a newborn.

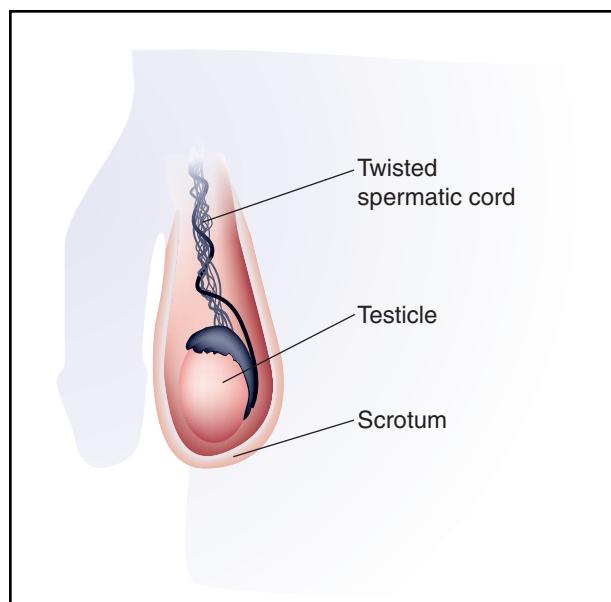
Symptoms of testicular torsion are sudden severe pain in the scrotum, swelling, **nausea and vomiting**.

Diagnosis

A nuclear scan of the scrotum may be performed. In this procedure, a tiny amount of radioactive fluid is injected into the blood and detected as it flows through the scrotum and testicles. Torsion is indicated if the radioactive fluid does not flow through the sore testis. Ultrasound scan accompanied by a contrast agent can also be used to diagnose testicular torsion.

Treatment

Surgery must be performed within 24 hours to ensure the health of the affected testis. During the procedure, the surgeon untwists the cord and secures the testis in place so that it cannot rotate again. The other testicle



A rare condition, testicular torsion occurs when the spermatic cord is twisted and cuts off the blood supply to the testicle. (Illustration by Argosy Inc.)

KEY TERMS

Orchiopexy—The surgical securing of the testis to prevent torsion.

Scrotum—The bag of skin below the penis that contains the testes.

should also be secured to deter future testicular torsion. This procedure is called orchiopexy.

Prognosis

If the torsion is relieved within 24 hours, the testis will recover normal blood flow and function.

Prevention

Torsion of the unaffected testis is prevented by securing it during the surgery to correct the twisted testis.

Resources

BOOKS

- Rajfer, Jacob. "Congenital Anomalies of the Testes and Scrotum." In *Campbell's Urology*, ed. Patrick C. Walsh, et al. Philadelphia: W. B. Saunders Co., 1998.

Rozauski, Thomas, et al. "Surgery of the Scrotum and Testis in Children." In *Campbell's Urology*. ed. Patrick C. Walsh, et al. Philadelphia: W. B. Saunders Co., 1998.

Walsh, Patrick C., et al., ed. *Campbell's Urology*. Philadelphia: W. B. Saunders Co., 1998.

J. Ricker Polsdorfer, MD

Testicular ultrasound see **Scrotal ultrasound**

Testicular x ray see **Scrotal nuclear medicine scan**

Testosterone test see **Sex hormones tests**

Tetanus

Definition

Tetanus is a rare but often fatal disease that affects the central nervous system by causing painful muscular contractions. It begins when tetanus bacteria enter the body, usually through a wound or cut exposed to contaminated soil. Tetanus is easily preventable through **vaccination**.

Description

Tetanus is rare in the United States, with nearly all cases occurring in adults who were not vaccinated as children. About 100 cases are reported each year; 63% of these occur in people over the age of 50. The number of tetanus cases in the United States has steadily decreased since the 1940s (500 to 600 cases per year); the number of reported cases has remained at approximately 50 to 100 cases per year since the mid-1970s. In 1999, however, the lowest number of annual cases to date was reported (33, or 0.02 per 100,000).

Tetanus causes convulsive muscle spasms and rigidity that can lead to respiratory **paralysis** and **death**. It is sometimes called "lockjaw" because one of the most common symptoms is a stiff jaw, unable to be opened. Sometimes, tetanus affects only the part of the body where the infection began, but in almost all of reported cases, it spreads to the entire body. The incubation period from the time of the injury until the first symptoms appear ranges from two to 50 days. Symptoms usually occur within five to 10 days. When symptoms occur early, the chance of death is increased. Tetanus is not contagious.

Causes and symptoms

Tetanus is caused by a bacteria called *Clostridium tetani*, whose spores (the dormant form) are found in soil,

street dust, and animal (or even human) feces. Tetanus spores germinate in the body, producing a highly poisonous neurotoxin in the blood, spreading to the nervous system. The infection is usually transmitted through deep puncture **wounds** or cuts or scratches that are not cleaned well. Between 1997 and 1999, approximately 64% of tetanus cases in the United States were associated with such wounds as punctures, lacerations, or abrasions. Many people associate tetanus with rusty nails and other dirty objects, but any wound can be a source. Less common ways of getting tetanus are animal scratches and bites, surgical wounds, dental work, and therapeutic abortion. About 18% of cases reported between 1997 and 1999 were a result of intravenous drug use. Cases have also been reported in people with no known wound or medical condition.

The first symptom of tetanus is often a stiff or "locked" jaw that prevents the patient from opening his/her mouth or swallowing. This is also called trismus and results in a facial expression called a sardonic smile (or risus sardonicus). Stiffness of the neck and other muscles throughout the body and uncontrollable spasms often follow. Sometimes these convulsions are severe enough to cause broken bones. The bacterial toxin (*tetanospasmin*) affects the nerve endings, causing a continuous stimulation of muscles. Other symptoms include irritability, restlessness, loss of appetite, and drooling. People with tetanus that is localized experience **pain** and tingling only at the wound site and spasms in nearby muscles.

In the underdeveloped world, neonatal tetanus accounts for about one-half of tetanus deaths and is related to infection of the umbilical stump in a baby born of an unimmunized mother. The Centers for Disease Control and Prevention (CDC) estimate that over 270,000 deaths occur annually worldwide as a result of neonatal tetanus. In contrast, only two cases of neonatal tetanus in the United States were reported to the CDC between 1989 and 1999. Mothers who have been adequately immunized against tetanus protect their newborns by passing the antibody through the placenta.

Diagnosis

Tetanus is diagnosed by the clinical symptoms and a medical history that shows no tetanus immunization. Early diagnosis and treatment is crucial to recovery from tetanus.

Treatment

Tetanus is a life-threatening disease that requires immediate hospitalization, usually in an intensive care unit (ICU). Treatment can take several weeks and includes **antibiotics** to kill the bacteria and shots of anti-

toxin to neutralize the toxin. It also includes muscle-relaxing drugs to control muscle spasms or **barbiturates** for **sedation**. In severe cases, patients are placed on an artificial respirator. Recovery can take six weeks or more. After recovery, since the levels of circulating toxin are too low to stimulate natural antibody production, the patient must still be immunized against this disease to prevent reinfection.

Prognosis

Up to 30% of tetanus victims in the United States die. Early diagnosis and treatment improves the prognosis. Neonatal tetanus has a mortality rate of more than 90%.

Prevention

Pre-exposure vaccination

Tetanus is easily preventable through vaccination. All children should have a series of five doses of DTaP, a combined vaccine that offers protection against **diphtheria**, tetanus, and pertussis, before the age of seven, according to the Centers for Disease Control and Prevention's national immunization guidelines, the Advisory Committee on Immunization Practices, the Committee on Infectious Diseases of the American Academy of Pediatrics, and the American Academy of Family Physicians. Children will not be admitted to school without proof of this and other immunizations.

The DTaP (diphtheria, tetanus, acellular pertussis) vaccine should be given at ages two months, four months, six months, 15 to 18 months, and four to six years. DTaP is the preferred vaccine for children up to the age of seven in the United States; it has fewer side effects than DTP and can be used to complete a vaccination schedule begun with DTP. DTaP was first approved by the Food and Drug Administration (FDA) in September 1996. In December 1996, it was approved for use in infants. Between the ages of 11 and 13, children should have a booster for diphtheria and tetanus, called Td.

Adults should have a Td booster every 10 years. Statistics from the Centers for Disease Control and Prevention (CDC) show that fewer than half of Americans 60 years of age and older have antibodies against tetanus. The CDC suggests adults may be revaccinated at mid-decade birthdays (for example, 45, 55). Adults who have never been vaccinated against tetanus should get a series of three injections of Td over six to 12 months and then follow the 10-year booster shot schedule.

Side effects of the tetanus vaccine are minor: soreness, redness, or swelling at the site of the injection that appear anytime from a few hours to two days after the



One characteristic of tetanus bacillus is the recurrent contracture of a muscle. Here, the patient's left hand is affected. (Custom Medical Stock Photo. Reproduced by permission.)

vaccination and go away in a day or two. Rare but serious side effects that require immediate treatment by a doctor are serious allergic reactions or deep, aching pain and muscle wasting in the upper arms. These symptoms could start from two days to four weeks after the shot and could continue for months.

In early 2001, a shortage of the tetanus vaccine became evident after the pharmaceutical company Wyeth-Ayerst Laboratories decided to stop production of the tetanus vaccine, leaving Aventis-Pasteur as the sole manufacturer of the vaccine. As a result, hospitals were provided with only a minimal amount of the drug on a weekly basis—enough to vaccinate patients with potentially infected wounds and other priority cases. Despite stepped-up production efforts on the part of the manufacturer, however, a spokesperson for Aventis-Pasteur predicted that the shortage would last until the end of 2001, as the vaccine takes 11 months to produce.

Post-exposure care

Keeping wounds and scratches clean is important in preventing infection. Since this organism grows only in the absence of oxygen, wounds must be adequately cleaned of dead tissue and foreign substances. Run cool water over the wound and wash it with a mild soap. Dry it with a clean cloth or sterile gauze. To help prevent infection, apply an antibiotic cream or ointment and cover the wound with a bandage. The longer a wound takes to heal, the greater the chance of infection. If the wound doesn't heal, or if it is red, warm, drains, or swells, consult a doctor.

Following a wound, to produce rapid levels of circulating antibody, a doctor may administer a specific antitoxin (human tetanus immune globulin, TIG) if the individual

KEY TERMS

Clostridium—A genus of deadly bacteria that are responsible for tetanus and other serious diseases, including botulism and gangrene from war wounds. Clostridia thrive without oxygen.

DTaP—Diphtheria and tetanus toxoids and acellular pertussis combination vaccine.

DTP—Diphtheria, tetanus, and whole-cell pertussis vaccine.

Td—Tetanus and diphtheria vaccine.

Toxin—A poisonous substance that flows through the body.

Wound—Any injury that breaks the skin, including cuts, scratches, and puncture wounds.

does not have an adequate history of immunization. The antitoxin is given at the same sitting as a dose of vaccine but at separate sites. Some individuals will report a history of significant allergy to “tetanus shots.” In most cases, this occurred in the remote past and was probably due to the previous use of antitoxin derived from horse serum.

Resources

PERIODICALS

“Have You Had Your Shots Yet?” *Tufts University Health & Nutrition Newsletter* (August 1997): 4.

Landers, Susan J. “Tetanus vaccine shortage leads to rationing.” *American Medical News*. <http://www.ama-assn.org/sci-pubs/amnews/pick_01/hlsb0319.htm>. (19 March 2001).

Zamalu, Evelyn. “Adults Need Tetanus Shots, Too.” *FDA Consumer* (July/August 1996): 14-18.

OTHER

“Childhood Infections: Tetanus.” The Nemours Foundation of the duPont Hospital for Children and the Nemours Children’s Clinic. <<http://www.KidsHealth.org>>. (10 December 1997).

“Shots for Safety.” National Institute on Aging Age Page. <<http://www.nih.gov/nia/health/pubpub/shots.htm>>. (7 December 1997).

“Taking Care of Cuts, Scrapes, and Minor Wounds: What Mom May Not Have Told You.” Mayo Health Oasis. <<http://www.mayo.edu>>. (9 December 1997).

“Tetanus.” Centers for Disease Control and Prevention. <<http://www.cdc.gov/nip/publications/pink/tetanus.pdf>>.

“Tetanus & Diphtheria (Td) Vaccine.” Centers for Disease Control and Prevention. <<http://www.healthtouch.com/level1/leaflets/cdc181.htm>>. (10 December 1997).

Lori De Milto

Tetracyclines

Definition

Tetracyclines are medicines that kill certain infection-causing microorganisms.

Purpose

Tetracyclines are called “broad-spectrum” **antibiotics**, because they can be used to treat a wide variety of infections. Physicians may prescribe these drugs to treat eye infections, **pneumonia**, **gonorrhea**, **Rocky Mountain spotted fever**, urinary tract infections, and other infections caused by bacteria. The medicine is also used to treat **acne**. The tetracyclines will *not* work for colds, flu, and other infections caused by viruses.

Description

Tetracyclines are available only with a physician’s prescription. They are sold in capsule, tablet, liquid, and injectable forms. Some commonly used medicines in this group are tetracycline (Achromycin V, Sumycin) and doxycycline (Doryx, Vibramycin).

Recommended dosage

The recommended dosage depends on the type of tetracycline, its strength, and the type and severity of infection for which it is being taken. Check with the physician who prescribed the drug or the pharmacist who filled the prescription for the correct dosage.

To make sure the infection clears up completely, take the medicine for as long as it has been prescribed. Do not stop taking the drug just because symptoms begin to improve.

Tetracyclines work best when they are at constant levels in the blood. To help keep levels constant, take the medicine in doses spaced evenly through the day and night. Do not miss any doses.

This medicine works best when taken on an empty stomach, with a full glass of water. The water will help prevent irritation of the stomach and esophagus (the tube-like structure that runs from the throat to the stomach). If the medicine still causes stomach upset, it may be necessary to take it with food. However, tetracyclines should *never* be taken with milk or milk products, as these may prevent the medicine from working properly. Do not drink or eat milk or dairy products within one to two hours of taking tetracyclines (except doxycycline and minocycline).

Precautions

Taking outdated tetracyclines can cause serious side effects. Do not take this medicine if:

- its color, appearance, or taste have changed
- it has been stored in a warm or damp area
- the expiration date on its label has passed flush any such medicine down the toilet, if there is any question about whether the medicine is still good, check with a physician or pharmacist

Do not take **antacids**, calcium supplements, salicylates such as Magan or Trilisate, magnesium-containing **laxatives**, or sodium bicarbonate (baking soda) within one to two hours of taking tetracyclines.

Do not take any medicines that contain iron (including multivitamin and mineral supplements) within two to three hours of taking tetracyclines.

Some people feel dizzy when taking these drugs. The medicine may also cause blurred vision. Because of these possible effects, anyone who takes these drugs should not drive, use machines or do anything else that might be dangerous until they have found out how the drugs affect them.

Birth control pills may not work properly while tetracyclines are being taken. To prevent **pregnancy**, use alternative methods of birth control while taking tetracyclines.

This medicine may increase sensitivity to sunlight. Even brief exposure to sun can cause a severe **sunburn** or a rash. While being treated with this medicine, avoid being in direct sunlight, especially between 10 A.M. and 3 P.M.; wear a hat and tightly woven clothing that covers the arms and legs; use a sunscreen with a skin protection factor (SPF) of at least 15; protect the lips with a sun block lipstick; and do not use tanning beds, tanning booths, or sunlamps. The sensitivity to sunlight and sunlamps may continue for two weeks to several months after stopping the medicine, so continue to be careful about sun exposure.

Tetracyclines may permanently discolor the teeth of people who took the medicine in childhood. The drugs may also slow down the growth of children's bones. Do not give tetracyclines to infants or children under 8 years of age unless directed to do so by the child's physician.

Special conditions

People with certain medical conditions or who are taking certain other medicines may have problems if they take tetracyclines. Before taking these drugs, be sure to let the physician know about any of these conditions:

ALLERGIES. Anyone who has had unusual reactions to tetracyclines in the past should let his or her physician know before taking the drugs again. The physician should also be told about any **allergies** to foods, dyes, preservatives, or other substances.

PREGNANCY. Pregnant women should not take tetracyclines during the last half of pregnancy. These drugs can prevent the baby's bones and teeth from developing properly and can cause the baby's adult teeth to be permanently discolored. The medicine can also cause liver problems in pregnant women.

BREASTFEEDING. Women who are breastfeeding should not take tetracyclines. The drugs pass into breast milk and can affect the nursing baby's teeth and bones. They may also make the baby more sensitive to sunlight and may increase its risk of fungal infections.

OTHER MEDICAL CONDITIONS. Before using tetracyclines, people with any of these medical problems should make sure their physicians are aware of their conditions:

- diabetes
- liver disease
- kidney disease

USE OF CERTAIN MEDICINES. Taking tetracyclines with certain other drugs may affect the way the drugs work or may increase the chance of side effects.

Side effects

The most common side effects are stomach cramps or a burning sensation in the stomach, mild **diarrhea**, nausea, or vomiting. These problems usually go away as the body adjusts to the drug and do not require medical treatment. Less common side effects, such as sore mouth or tongue and **itching** of the rectal or genital areas also may occur and do not need medical attention unless they do not go away or they are bothersome.

Other rare side effects may occur. Anyone who has unusual symptoms during or after treatment with tetracyclines should get in touch with his or her physician.

Interactions

Tetracyclines may interact with other medicines. When this happens, the effects of one or both of the drugs may change or the risk of side effects may be greater. Anyone who takes tetracyclines should let the physician know all other medicines he or she is taking. Among the drugs that may interact with tetracyclines are:

- antacids

KEY TERMS

Gonorrhea—A sexually transmitted disease (STD) that causes infection in the genital organs and may cause disease in other parts of the body.

Microorganism—An organism that is too small to be seen with the naked eye.

Rocky Mountain spotted fever—An infectious disease that is caused by a microorganism and spread by ticks. High fever, muscle pain, and spots on the skin are among the symptoms.

Salicylates—A group of drugs that includes aspirin and related compounds. Salicylates are used to relieve pain, reduce inflammation, and lower fever.

- calcium supplements
- medicines that contain iron (including multivitamin and mineral supplements)
- laxatives that contain magnesium
- cholesterol-lowering drugs such as cholestyramine (Questran) and colestipol (Colestid)
- salicylates such as Magan and Trilisate
- penicillins
- birth control pills

Nancy Ross-Flanigan

KEY TERMS

Aorta—Main arterial trunk that moves blood from the heart to the arteries, which transport the blood throughout the body.

Cyanosis—Blue-colored skin due to oxygen-deficient blood.

Endocarditis—Inflammation of the lining of the heart.

Infarct—Death of tissue due to shutting off the blood supply.

Septicemia—Blood poisoning.

Systemic circulation—Through the body, as opposed to “pulmonary”—through the lungs.

Ventricles—The muscular chambers of the heart that do the pumping.

- **ventricular septal defect** (Abnormal passageway between the right and left ventricles)
- displaced aorta
- narrowed pulmonary valve
- thickened right ventricle wall

Each defect acts in combination with the others to create a malfunction of the heart. The problem starts very early in the uterus with a narrowed pulmonary valve and a hole between the ventricles. This is not particularly a problem for a fetus because hardly any blood flows through the lungs until birth. It is only after birth that the defects pose a problem. The blood that is supposed to start flowing through the lungs cannot easily get there because of the narrowed valve; however, the hole between the ventricles remains open. Because of the opening between ventricles, much of the blood that comes back to the heart needing oxygen is sent out without being properly oxygenated. In addition, the right heart has to pump at the same pressure as the left side. Several changes follow. First, the baby turns blue (cyanotic) because of the deoxygenated blood that bypasses the lungs. Deoxygenated blood is darker and appears blue through the skin. Second, the right side of the heart (ventricle) hypertrophies (gets more muscular) from the extra **exercise** demanded of it. Next, the low oxygen causes the blood to get thicker and clot more easily. Clots in the veins can now pass through the hole in the heart and directly enter the aorta, where they can do much more damage than in the lungs—such as causing infarcts in the brain. In addition, these anomalies make the lining of the heart more suscep-

Tetralogy of Fallot

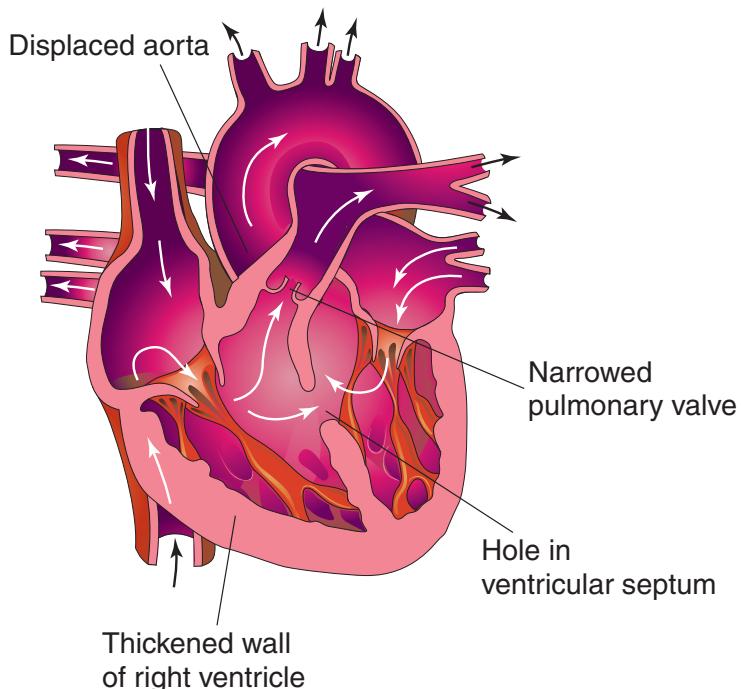
Definition

Tetralogy of Fallot is a common syndrome of congenital heart defects.

Description

The heart is two pumps in one. The ventricle on the left side pumps blood full of oxygen through the body; the ventricle on the right side pumps the same blood through the pulmonary artery to the lungs to take up oxygen. The left ventricle operates at pressures about four times as high as the right ventricle. Blood is supposed to flow through one side, then the other.

Tetralogy of Fallot is a condition that is characterized by several congenital heart defects occurring at once. They include:



Tetralogy of Fallot is a common syndrome of congenital heart defects. This condition, present *in utero*, is caused by the narrowing of the pulmonary artery and a hole between the ventricles. When the baby is born and begins to breathe on its own, the baby turns cyanotic, or blue, due to the deoxygenated blood that bypasses the lungs because of the narrowed pathway and because the hole between the ventricles has remained open. (Illustration by Electronic Illustrators Group.)

tible to infection—endocarditis—which can damage valves and lead to blood **poisoning** (septicemia).

Causes and symptoms

Tetralogy of Fallot is a congenital defect with unknown causes.

Babies with tetralogy of Fallot are blue at birth (**cyanosis**). Sometimes the blue color appears only when they cry. They also have detectable **heart murmurs**. Infants with mild forms can have surgery postponed until they are older. Infants with more severe symptoms often have attacks of worsened cyanosis. During attacks, they turn very blue, have **shortness of breath**, and can faint. This usually occurs during heightened activity, such as crying.

Diagnosis

A complete evaluation of the circulation is required, including testing the blood for its oxygen content, ultrasound and x rays of the heart accompanied by a contrast agent to determine the amount of blood flowing in the wrong direction. A search for other **birth defects** is also necessary, because they tend to happen together.

Treatment

Correction of the defects are done through surgery. Surgery must be carefully timed with attention to the progression of the disease process, the size of the infant, and the size of the various defects. There are temporary surgical procedures that can prolong the time before corrective surgery while the baby grows larger and stronger.

During surgery, the pulmonary valve is widened, the ventricular septal defect is closed, and any interim corrections removed.

Prognosis

Surgical correction has a high rate of success, returning the child to near-normal health.

Resources

BOOKS

- Friedman, William F., and John S. Child. "Congenital Heart Disease in the Adult." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Nelson Textbook of Pediatrics. Ed. Richard E. Behrman.
Philadelphia: W. B. Saunders Co., 1996.

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Thalassemia

Definition

Thalassemia describes a group of inherited disorders characterized by reduced or absent amounts of hemoglobin, the oxygen-carrying protein inside the red blood cells. There are two basic groups of thalassemia disorders: alpha thalassemia and beta thalassemia. These conditions cause varying degrees of anemia, which can range from insignificant to life threatening.

Description

All types of thalassemias are considered *quantitative* diseases of hemoglobin, because the quantity of hemoglobin produced is reduced or absent. Usual adult hemoglobin is made up of three components: alpha globin, beta globin, and heme. Thalassemias are classified according to the globin that is affected, hence the names *alpha* and *beta* thalassemia. Although both classes of thalassemia affect the same protein, the alpha and beta thalassemias are distinct diseases that affect the body in different ways.

Beta thalassemia

Beta thalassemia may be the best-known type of thalassemia and is also called Cooley's anemia. It is caused by a change in the gene for the beta globin component of hemoglobin. Beta thalassemia causes variable anemia that can range from moderate to severe, depending in part on the exact genetic change underlying the disease. Beta thalassemia can be classified based on clinical symptoms. *Beta thalassemia major* usually causes severe anemia that can occur within months after birth. If left untreated, severe anemia can result in insufficient growth and development, as well as other characteristic physical complications that can lead to a dramatically decreased life-expectancy. Fortunately, in developed countries beta thalassemia is usually identified by screening in the newborn period, before symptoms have developed. Children who are identified early can be started on ongoing blood **transfusion** therapy as needed. Although transfusion therapy prevents many of the complications of severe anemia, the body is unable to eliminate the excess iron contained in the transfused blood. Over time, this excess

iron deposits in tissues and organs, resulting in damage and organ failure. Another medication must be administered to help the body eliminate the excess iron and prevent iron-overload complications. *Beta thalassemia intermedia* describes the disease in individuals who have moderate anemia that only requires blood transfusions intermittently, if at all.

Alpha thalassemia

Alpha thalassemia is the result of changes in the genes for the alpha globin component of hemoglobin. There are two main types of alpha thalassemia disease: hemoglobin H disease and alpha thalassemia major. The two diseases are quite different from beta thalassemia as well as from one another. Individuals with hemoglobin H disease can experience events of hemolytic anemia—anemia caused by the rapid breakdown of the red blood cells. These events are thought to be triggered by various environmental causes, such as infection and/or exposure to certain chemicals. Hemoglobin H disease is in most cases milder than beta thalassemia. It does not generally require transfusion therapy. *Alpha thalassemia major* is a very serious disease that results in severe anemia that begins even before birth. Most affected babies do not survive to be born or die shortly after birth.

The thalassemias are among the most common genetic diseases worldwide. Both alpha and beta thalassemia have been described in individuals of almost every ancestry, but the conditions are more common among certain ethnic groups. Unaffected carriers of all types of thalassemia traits do not experience health problems. In fact, the thalassemia trait is protective against **malaria**, a disease caused by blood-borne parasites transmitted through mosquito bites. According to a widely accepted theory, most genetic changes—mutations—that cause thalassemia occurred multiple generations ago. Coincidentally, these mutations increased the likelihood that carriers would survive malaria infection. Survivors passed the mutation onto their offspring, and the trait became established throughout areas where malaria is common. As populations migrated, so did the thalassemia traits.

Beta thalassemia trait is seen most commonly in people with the following ancestry: Mediterranean (including North African, and particularly Italian and Greek), Middle Eastern, Indian, African, Chinese, and Southeast Asian (including Vietnamese, Laotian, Thai, Singaporean, Filipino, Cambodian, Malaysian, Burmese, and Indonesian). Alpha-thalassemia trait is seen with increased frequency in the same ethnic groups. However, there are different types of alpha thalassemia traits within these populations. The frequency of hemoglobin H disease and alpha thalassemia major depends on the type of

alpha thalassemia trait. The populations in which alpha thalassemia diseases are most common include Southeast Asians and Chinese (particularly Southern Chinese).

It is difficult to obtain accurate prevalence figures for various types of thalassemia within different populations. This difficulty arises due to testing limitations in determining exact genetic diagnoses, as well as the fact that many studies have focused on small, biased hospital populations.

Two studies reflect prevalence figures that can be helpful counseling families and determining who to screen for beta thalassemia. Between the years of 1990 and 1996, the State of California screened over 3.1 million infants born in this multiethnic state for beta thalassemia. Approximately one in 114,000 infants had beta thalassemia major, with prevalence rates being highest among Asian Indians (about one in 4,000), Southeast Asians (about one in 10,000), and Middle Easterners (about one in 7,000). Another type of beta thalassemia disease, E/beta thalassemia, was represented in approximately one in 110,000 births, all of which occurred in families of Southeast Asian ancestry. Among Southeast Asians, the prevalence of E/beta thalassemia was approximately one in 2,600 births. This is in keeping with the observation that hemoglobin E trait carrier rates are relatively high within the Southeast Asian population: 16% in a study of 768 immigrants to California, and up to 25% in some specific Southeast Asian populations such as Cambodians. While these California studies address some of the limitations of earlier population studies, the pattern observed in California is expected to be different in other areas of the United States and the world. For example, Italians are underrepresented in this population when compared to the population of the East Coast of the United States.

Determining prevalence figures for alpha thalassemia is even more difficult due to increased limitations in diagnostic testing. All types of alpha thalassemia disease are most common among people of Southeast Asian and Chinese descent, for reasons that become clearer with an understanding of the underlying genetics of alpha thalassemia. One study of 500 pregnant women in Northern Thailand estimated a frequency of one in 500 pregnancies affected by alpha thalassemia major, for example. Prevalence of alpha thalassemia disease is significantly lower in the United States owing primarily to immigration patterns; although at least one state, California, has observed growing hemoglobin H disease incidence rates that are high enough to justify universal newborn screening for the condition.

Causes

Genetics

Humans normally make several types of the oxygen-carrying protein hemoglobin. An individual's stage in

development determines whether he or she makes primarily embryonic, fetal, or adult hemoglobins. All types of hemoglobin are made of three components: heme, alpha (or alpha-like) globin, and beta (or beta-like) globin. All types of thalassemia are caused by changes in either the alpha- or beta-globin gene. These changes cause little or no globin to be produced. The thalassemias are, therefore, considered *quantitative* hemoglobin diseases. All types of thalassemias are recessively inherited, meaning that a genetic change must be inherited from both the mother and the father. The severity of the disease is influenced by the exact thalassemia mutations inherited, as well as other genetic and environmental factors. There are rare exceptions, notably with beta thalassemia, where globin gene mutations exhibit a dominant pattern of inheritance in which only one gene needs to be altered in order to see disease expression.

BETA-THALASSEMIA. Most individuals have two normal copies of the beta globin gene, which is located on chromosome 11 and makes the beta globin component of normal adult hemoglobin, hemoglobin A. There are approximately 100 genetic mutations that have been described that cause beta thalassemia, designated as either beta⁰ or beta⁺ mutations. No beta globin is produced with a beta⁰ mutation, and only a small fraction of the normal amount of beta globin is produced with a beta⁺ mutation.

When an individual has one normal beta globin gene and one with a beta thalassemia mutation, he or she is said to carry the beta thalassemia trait. Beta thalassemia trait, like other hemoglobin traits, is protective against malaria infection. Trait status is generally thought not to cause health problems, although some women with beta thalassemia trait may have an increased tendency toward anemia during pregnancy.

When two members of a couple carry the beta thalassemia trait, there is a 25% chance that each of their children will inherit beta thalassemia disease by inheriting two beta thalassemia mutations, one from each parent. The clinical severity of the beta thalassemia disease—whether an individual has beta thalassemia intermedia or beta thalassemia major—will depend largely on whether the mutations inherited are beta⁰ thalassemia or beta⁺ thalassemia mutations. Two beta⁰ mutations generally lead to beta thalassemia major, and two beta⁺ thalassemia mutations generally lead to beta thalassemia intermedia. Inheritance of one beta⁰ and one beta⁺ thalassemia mutation tends to be less predictable.

Although relatively uncommon, there are other thalassemia-like mutations that can affect the beta globin gene. Hemoglobin E is the result of a substitution of a single nucleotide. This change results in a structurally

altered hemoglobin that is produced in decreased amounts. Therefore, hemoglobin E is unique in that it is both a quantitative (i.e. thalassemia-like) and qualitative trait. When co-inherited with a beta thalassemia trait, it causes a disease that is almost indistinguishable from beta thalassemia disease. Large deletions around and including the beta globin gene can lead to delta/beta thalassemia or hereditary persistence of fetal hemoglobin (HPFH). Interestingly, delta/beta thalassemia trait behaves very similar to beta thalassemia trait in its clinical manifestations. However, HPFH trait does not tend to cause hemoglobin disease when co-inherited with a second thalassemia or other beta globin mutation.

ALPHA-THALASSEMIA. Most individuals have four normal copies of the alpha globin gene, two copies on each chromosome 16. These genes make the alpha globin component of normal adult hemoglobin, which is called hemoglobin A. Alpha globin is also a component of fetal hemoglobin and the other major adult hemoglobin called hemoglobin A2. Mutations of the alpha globin genes are usually deletions of the gene, resulting in absent production of alpha globin. Since there are four genes (instead of the usual two) to consider when looking at alpha globin gene inheritance, there are several alpha globin types that are possible.

Absence of one alpha globin gene leads to a condition known as silent alpha thalassemia trait. This condition causes no health problems and can be detected only by special **genetic testing**. Alpha thalassemia trait occurs when two alpha globin genes are missing. This can occur in two ways. The genes may be deleted from the same chromosome, causing the ‘*cis*’ type of alpha thalassemia trait. Alternately, they may be deleted from different chromosomes, causing the ‘*trans*’ type of alpha thalassemia trait. In both instances, there are no associated health problems, although the trait status may be detected by more routine blood screening.

Hemoglobin H disease results from the deletion of three alpha globin genes, such that there is only one functioning gene. Typically, this can occur when one parent carries the silent alpha thalassemia trait, and the other parent carries the ‘*cis*’ type of the alpha thalassemia trait. In this situation, there is a 25% chance for hemoglobin H disease in each of such a couple’s children.

Hemoglobin H disease-like symptoms can also be a part of a unique condition called *alpha thalassemia mental retardation syndrome*. Alpha thalassemia **mental retardation** syndrome can be caused by a deletion of a significant amount of chromosome 16, affecting the alpha globin genes. This is usually not inherited, but rather occurs sporadically in the affected individual. Affected individuals have mild hemoglobin H disease,

mild-to-moderate mental retardation, and characteristic facial features. This syndrome can also occur as a sex-linked form in which a mutation is inherited in a particular gene on the X-chromosome. This gene influences alpha globin production, as well as various other developmental processes. Individuals affected with this form of the syndrome tend to have more severe mental retardation, delayed development, nearly absent speech, characteristic facial features, and genital-urinary abnormalities. The remaining discussion will focus only on aspects of hemoglobin H disease.

Alpha thalassemia major results from the deletion of all four alpha globin genes, such that there are no functioning alpha globin genes. This can occur when both parents carry the ‘*cis*’ type of the alpha thalassemia trait. In this situation, there is a 25% chance for alpha thalassemia major in each of such a couple’s children.

Symptoms

Beta thalassemia

Beta thalassemia major is characterized by severe anemia that can begin months after birth. In the United States and other developed countries beta thalassemia is identified and treated early and effectively. Therefore, the following discussion of symptoms applies primarily to affected individuals in the past and unfortunately in some underdeveloped countries now. If untreated, beta thalassemia major can lead to severe lethargy, paleness, and growth and developmental delay. The body attempts to compensate by producing more blood, which is made inside the bones in the marrow. However, this is ineffective without the needed genetic instructions to make enough functioning hemoglobin. Instead, obvious bone expansion and changes occur that cause characteristic facial and other changes in appearance, as well as increased risk of **fractures**. Severe anemia taxes other organs in the body—such as the heart, spleen, and liver—which must work harder than usual. This can lead to **heart failure**, as well as enlargement and other problems of the liver and spleen. When untreated, beta thalassemia major generally results in childhood **death**, usually due to heart failure. Fortunately, in developed countries diagnosis is usually made early, often before symptoms have begun. This allows for treatment with blood transfusion therapy, which can prevent most of the complications of the severe anemia caused by beta thalassemia major. Individuals with beta thalassemia intermedia have a more moderate anemia that may only require treatment with transfusion intermittently, such as when infections occur and stress the body. As a person with beta thalassemia intermedia gets older, however, the need for blood transfusions may increase to the point that

KEY TERMS

Anemia—A blood condition in which the level of hemoglobin or the number of red blood cells falls below normal values. Common symptoms include paleness, fatigue, and shortness of breath.

Bilirubin—A yellow pigment that is the end result of hemoglobin breakdown. This pigment is metabolized in the liver and excreted from the body through the bile. Bloodstream levels are normally low; however, extensive red cell destruction leads to excessive bilirubin formation and jaundice.

Bone marrow—A spongy tissue located in the hollow centers of certain bones, such as the skull and hip bones. Bone marrow is the site of blood cell generation.

Bone marrow transplantation—A medical procedure used to treat some diseases that arise from defective blood cell formation in the bone marrow. Healthy bone marrow is extracted from a donor to replace the marrow in an ailing individual. Proteins on the surface of bone marrow cells must be identical or very closely matched between a donor and the recipient.

Desferoxamine—The primary drug used in iron chelation therapy. It aids in counteracting the life-threatening buildup of iron in the body associated with long-term blood transfusions.

Globin—One of the component protein molecules found in hemoglobin. Normal adult hemoglobin has a pair each of alpha-globin and beta-globin molecules.

Heme—The iron-containing molecule in hemoglobin that serves as the site for oxygen binding.

Hemoglobin—Protein-iron compound in the blood that carries oxygen to the cells and carries carbon dioxide away from the cells.

Hemoglobin A—Normal adult hemoglobin that contains a heme molecule, two alpha-globin molecules, and two beta-globin molecules.

Hemoglobin electrophoresis—A laboratory test that separates molecules based on their size, shape, or electrical charge.

Hepatomegaly—An abnormally large liver.

HLA type—Refers to the unique set of proteins called human leukocyte antigens. These proteins are present on each individual's cell and allow the immune system to recognize 'self' from 'foreign'. HLA type is particularly important in organ and tissue transplantation.

Hydroxyurea—A drug that has been shown to induce production of fetal hemoglobin. Fetal hemoglobin has a pair of gamma-globin molecules in place of the typical beta-globins of adult hemoglobin. Higher-than-normal levels of fetal hemoglobin can ameliorate some of the symptoms of thalassemia.

Iron overload—A side effect of frequent blood transfusions in which the body accumulates abnormally high levels of iron. Iron deposits can form in organs, particularly the heart, and cause life-threatening damage.

Jaundice—Yellowing of the skin or eyes due to excess of bilirubin in the blood.

Mutation—A permanent change in the genetic material that may alter a trait or characteristic of an individual, or manifest as disease, and can be transmitted to offspring.

Placenta—The organ responsible for oxygen and nutrition exchange between a pregnant mother and her developing baby.

Red blood cell—Hemoglobin-containing blood cells that transport oxygen from the lungs to tissues. In the tissues, the red blood cells exchange their oxygen for carbon dioxide, which is brought back to the lungs to be exhaled.

Screening—Process through which carriers of a trait may be identified within a population.

Splenomegaly—Enlargement of the spleen.

they are required on a regular basis. When this occurs their disease becomes more similar to beta thalassemia major. Other genetic and environmental factors can influence the course of the disease as well. For example, co-inheritance of one or two alpha thalassemia mutations can tend to ameliorate some of the symptoms of beta thalassemia disease, which result in part from an imbalance in the amount of alpha- and beta-globin present in the red blood cells.

Hemoglobin H disease

Absence of three alpha globin genes causes an imbalance of alpha and beta globin proteins in the red blood cells. The excess beta globin proteins tend to come together to form hemoglobin H, which is unable to release oxygen to the tissues. In addition, hemoglobin H tends to precipitate out in the cells, causing damage to the red blood cell membrane. When affected individuals are exposed to certain drugs and chemicals known to make the membrane more fragile, the cells are thought to become vulnerable to breakdown in large numbers, a complication called **hemolytic anemia**. Fever and infection are also considered to be triggers of hemolytic anemia in hemoglobin H disease. This can result in **fatigue**, paleness, and a yellow discoloration of the skin and whites of eyes called **jaundice**. Usually, the anemia is mild enough not to require treatment. Severe anemia events may require blood transfusion, however, and are usually accompanied by such other symptoms as dark feces or urine and abdominal or back **pain**. These events are uncommon in hemoglobin H disease, although they occur more frequently in a more serious type of hemoglobin H disease called hemoglobin H/Constant Spring disease. Individuals effected with this type of hemoglobin H disease are also more likely to have enlargement of and other problems with the spleen.

Alpha thalassemia major

Because alpha globin is a necessary component of all major hemoglobins and some minor hemoglobins, absence of all functioning alpha globin genes leads to serious medical consequences that begin even before birth. Affected fetuses develop severe anemia as early as the first trimester of pregnancy. The placenta, heart, liver, spleen, and adrenal glands may all become enlarged. Fluid can begin collecting throughout the body as early as the start of the second trimester, causing damage to developing tissues and organs. Growth retardation is also common. Affected fetuses usually miscarry or die shortly after birth. In addition, women carrying affected fetuses are at increased risk of developing complications of pregnancy and delivery. Up to 80% of such women develop toxemia, a disturbance of metabolism that can potentially lead to

convulsions and **coma**. Other maternal complications include premature delivery and increased rates of delivery by **cesarean section**, as well as hemorrhage after delivery.

Diagnosis

Thalassemia may be suspected if an individual shows signs that are suggestive of the disease. In all cases, however, laboratory diagnosis is essential to confirm the exact diagnosis and to allow for the provision of accurate **genetic counseling** about recurrence risks and testing options for parents and affected individuals. Screening is likewise recommended to determine trait status for individuals of high-risk ethnic groups.

The following tests are used to screen for thalassemia disease and/or trait:

- complete blood count
- **hemoglobin electrophoresis** with quantitative hemoglobin A2 and hemoglobin F
- free erythrocyte-protoporphyrin (or ferritin or other studies of serum iron levels)

A *complete blood count* will identify low levels of hemoglobin, small red blood cells, and other red blood cell abnormalities that are characteristic of a thalassemia diagnosis. Since thalassemia trait can sometimes be difficult to distinguish from iron deficiency, tests to evaluate iron levels are important. A *hemoglobin electrophoresis* is a test that can help identify the types and quantities of hemoglobin made by an individual. This test uses an electric field applied across a slab of gel-like material. Hemoglobins migrate through this gel at various rates and to specific locations, depending on their size, shape, and electrical charge. *Isoelectric focusing* and *high-performance liquid chromatography (HPLC)* use similar principles to separate hemoglobins and can be used instead of or in various combinations with hemoglobin electrophoresis to determine the types and quantities of hemoglobin present. Hemoglobin electrophoresis results are usually within the normal range for all types of alpha thalassemia. However, hemoglobin A2 levels and sometimes hemoglobin F levels are elevated when beta thalassemia disease or trait is present. Hemoglobin electrophoresis can also detect structurally abnormal hemoglobins that may be co-inherited with a thalassemia trait to cause thalassemia disease (i.e., hemoglobin E) or other types of hemoglobin disease (i.e., sickle hemoglobin). Sometimes DNA testing is needed in addition to the above screening tests. This can be performed to help confirm the diagnosis and establish the exact genetic type of thalassemia.

Diagnosis of thalassemia can occur under various circumstances and at various ages. Several states offer thalassemia screening as part of the usual battery of blood

tests done for newborns. This allows for early identification and treatment. Thalassemia can be identified before birth through the use of prenatal diagnosis. **Chorionic villus sampling** (CVS) can be offered as early as 10 weeks of pregnancy and involves removing a sample of the placenta made by the baby and testing the cells. CVS carries a risk of causing a **miscarriage** that is between 0.5%–1%. **Amniocentesis** is generally offered between 15 and 22 weeks of pregnancy, but can sometimes be offered earlier. Two to three tablespoons of the fluid surrounding the baby is removed. This fluid contains fetal cells that can be tested. The risk of miscarriage associated with amniocentesis ranges from 0.33–0.5%. Pregnant women and couples may choose prenatal testing in order to prepare for the birth of a baby that may have thalassemia. Alternately, knowing the diagnosis during pregnancy allows for the option of pregnancy termination. Preimplantation genetic diagnosis (PGD) is a relatively new technique that involves in-vitro fertilization followed by genetic testing of one cell from each developing embryo. Only the embryos unaffected by **sickle cell disease** are transferred back into the uterus. PGD is currently available on a research basis only and is relatively expensive.

Treatment

Beta Thalassemia

Individuals with beta thalassemia major receive regular blood transfusions, usually on a monthly basis. This helps prevent severe anemia and allow for more normal growth and development. Transfusion therapy does have limitations, however. Individuals can develop reactions to certain proteins in the blood—called a transfusion reaction. This can make locating appropriately matched donor blood more difficult. Although blood supplies in the United States are very safe, particularly relative to the past and to other areas of the world, there remains an increased risk of exposure to such blood-borne infections as hepatitis. Additionally, the body is not able to get rid of the excess iron that accompanies each transfusion. An additional medication called desferoxamine is administered, usually five nights per week over a period of several hours, using an automatic pump that can be used during sleep or taken anywhere the person goes. This medication is able to bind to the excess iron, which can then be eliminated through urine. If desferoxamine is not used regularly or is unavailable, iron overload can develop and cause tissue damage and organ damage and failure. The heart, liver, and endocrine organs are particularly vulnerable. Desferoxamine itself may rarely produce allergic or toxic side effects, including hearing damage. Signs of desferoxamine toxicity are screened for and generally develop in individuals who overuse the medication when body iron levels are sufficiently low. Overall, however,

transfusion and desferoxamine therapy have increased the life expectancy of individuals with the most severe types of beta thalassemia major to the 4th or 5th decade. This can be expected to improve with time and increased developments in treatment, as well as for those with more mild forms of the disease.

New treatments offer additional options for some individuals with beta thalassemia major. There are various medications that target the production of red blood cells (i.e. erythropoietin) or fetal hemoglobin (i.e. hydroxyurea and butyrate). Their effectiveness in ameliorating the severity of beta thalassemia is currently being investigated. Another promising new treatment is **bone marrow transplantation**, in which the bone marrow of an affected individual is replaced with the bone marrow of an unaffected donor. If successful, this treatment can provide a cure. However, there is an approximately 10-15% chance the procedure could be unsuccessful (i.e. the thalassemia returns); result in complications (i.e. graft-versus-host disease); or result in death. The risk for specific individuals depends on current health status, age, and other factors. Because of the risks involved and the fact that beta thalassemia is a treatable condition, transplant physicians require a brother or sister donor who has an identically matched tissue type, called HLA type. HLA type refers to the unique set of proteins present on each individual's cells, which allows the immune system to recognize "self" from "foreign." HLA type is genetically determined, so there is a 25% chance for two siblings to be a match. Transplant physicians and researchers are also investigating ways to improve the safety and effectiveness of bone marrow transplantation. Using newborn sibling umbilical cord blood—the blood from the placenta that is otherwise discarded after birth but contains cells that can go on to make bone marrow—seems to provide a safer and perhaps more effective source of donor cells. Donors and recipients may not have to be perfect HLA matches for a successful transplant using cord blood cells. Trials are also underway to determine the effectiveness of "partial transplants," in which a safer transplant procedure is used to replace only a percentage of the affected individual's bone marrow. Other possible treatments on the horizon may include **gene therapy** techniques aimed at increasing the amount of normal hemoglobin the body is able to make.

Hemoglobin H disease

Hemoglobin H disease is a relatively mild form of thalassemia that may go unrecognized. It is not generally considered a condition that will reduce one's life expectancy. Education is an important part of managing the health of an individual with hemoglobin H disease. It is important to be able to recognize the signs of severe

anemia that require medical attention. It is also important to be aware of the medications, chemicals, and other exposures to avoid due to the theoretical risk they pose of causing a severe anemia event. When severe anemia occurs, it is treated with blood transfusion therapy. For individuals with hemoglobin H disease, this is rarely required. For those with the hemoglobin H/Constant Spring form of the disease, the need for transfusions may be intermittent or ongoing, perhaps on a monthly basis and requiring desferoxamine treatment. Individuals with this more severe form of the disease may also have an increased chance of requiring removal of an enlarged and/or overactive spleen.

Alpha thalassemia major

Because alpha thalassemia major is most often a condition that is fatal in the prenatal or newborn period, treatment has previously been focused on identifying affected pregnancies in order to provide appropriate management to reduce potential maternal complications. Pregnancy termination provides one form of management. Increased prenatal surveillance and early treatment of maternal complications is an approach that is appropriate for mothers who wish to continue their pregnancy with the knowledge that the baby will most likely not survive. In recent years, there have been a handful of infants with this condition who have survived long-term. Most of these infants received experimental treatment including transfusions before birth, early delivery, and even bone marrow transplantation before birth, although the latter procedure has not yet been successful. For those infants that survive to delivery, there seems to be an increased risk of developmental problems and physical effects, particularly heart and genital malformations. Otherwise, their medical outlook is similar to a child with beta thalassemia major, with the important exception that ongoing, lifelong blood transfusions begin right at birth.

Prognosis

As discussed above, the prognosis for individuals with the most serious types of thalassemia has improved drastically in the last several years following recent medical advances in transfusion, chemo-, and transplantation therapy. Advances continue and promise to improve the life expectancy and quality of life further for affected individuals.

Resources

BOOKS

Cohen, A., et. al. *Cooley's Anemia: Progress in Biology and Medicine*. National Heart, Lung, and Blood Institute, 1995.

Stamatoyannopoulos, G., et. al., eds. *The Molecular Basis of Blood Diseases*. 2nd ed. Philadelphia: W.B. Saunders, 1994, pp. 176-177.

Weatherall, D.J. "The Thalassemias." In *Williams Hematology*, edited by Ernest Beutler, et al. 5th ed. New York: McGraw-Hill, 1995.

Weatherall, D.J., et al. "The Hemoglobinopathies." In *The Metabolic and Molecular Bases of Inherited Disease*, edited by Charles R. Scriver, et al. 7th ed. New York: McGraw-Hill, 1995.

PERIODICALS

- Collins, A.F., et. al. "Oral Sodium Phenylbutyrate Therapy in Homozygous Beta Thalassemia: A Clinical Trial." *Blood* 85, no.1 (1995): 43-49.
- Dumars, K.W., et. al. "Practical Guide to the Diagnosis of Thalassemia." *American Journal of Medical Genetics* 62 (1996): 29-37.
- Fucharoen, S., et. al. "Hydroxyurea Increases Hemoglobin F Levels and Improves the Effectiveness of Erythropoiesis in Beta-thalassemia/Hemoglobin E Disease." *Blood* 87, no. 3 (1996): 887-892.
- Giardini, Claudio. "Treatment of β-thalassemia." *Current Opinion in Hematology* 4 (1997): 79.
- Glader, B.E., and K.A. Look. "Hematologic Disorders in Children from Southeast Asia." *Pediatric Hematology* 43, no.3 (1996): 665-681.
- Lorey, F., et al. "Distribution of Hemoglobinopathy Variants by Ethnicity in a Multiethnic State." *Genetic Epidemiology* 13(1996): 501-512.
- Olivieri, N.F., and G.M. Brittenham. "Iron-Chelating Therapy and the Treatment of Thalassemia." *Blood* 89, no. 3 (1997): 739-761.
- Styles, L.A., et al. "Hemoglobin H-Constant Spring Disease: An Underrecognized, Severe Form of Alpha Thalassemia." *International Journal of Pediatric Hematology/Oncology* 4(1997): 69-74.
- Weatherall, D.J. "The Thalassemias." *British Medical Journal* 314 (June 7, 1997): 1675.
- Wilkie, A.O.M., et al. "Clinical Features and Molecular Analysis of the Alpha Thalassemia/Mental Retardation Syndromes: Cases Due to Deletions Involving Chromosome Band 16p13.3." *American Journal of Human Genetics* 46 (1990): 1112-1126.
- Wilkie, A.O.M., et al. "Clinical Features and Molecular Analysis of the Alpha Thalassemia/Mental Retardation Syndromes: Cases Without Detectable Abnormality of the Alpha Globin Complex." *American Journal of Human Genetics* 46 (1990): 1127-1140.
- Zeng, Y., et al. "Hydroxyurea Therapy in Beta-thalassemia Intermedia; Improvement in Haematological Parameters Due to Enhanced Beta-globin Synthesis." *British Journal of Haematology* 90 (1995): 557-563.

ORGANIZATIONS

Children's Blood Foundation. 333 East 38th St., Room 830, New York, NY 10016-2745. (212) 297-4336. <cfg@nyh.med.cornell.edu>.

- Cooley's Anemia Foundation, Inc. 129-09 26th Ave. #203, Flushing, NY 11354. (800) 522-7222 or (718) 321-2873. <<http://www.thalassemia.org>>.
- March of Dimes Birth Defects Foundation. 1275 Mamaroneck Ave., White Plains, NY 10605. (888) 663-4637. <resourcecenter@modimes.org>. <<http://www.modimes.org>>.
- National Heart, Lung, and Blood Institute. PO Box 30105, Bethesda, MD 20824-0105. (301) 592-8573. <nhlbiinfo@rover.nhlbi.nih.gov>. <<http://www.nhlbi.nih.gov>>.
- National Organization for Rare Disorders (NORD). PO Box 8923, New Fairfield, CT 06812-8923. (203) 746-6518 or (800) 999-6673. Fax: (203) 746-6481. <<http://www.rarediseases.org>>.

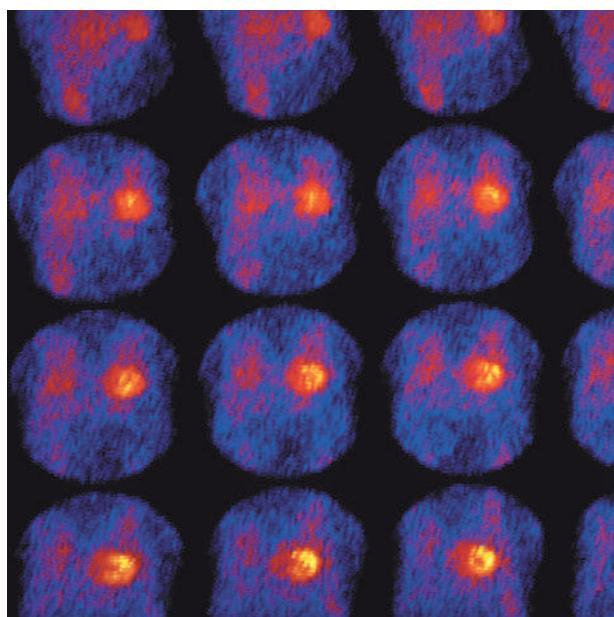
OTHER

- "Alpha-thalassemia Mental Retardation Syndrome, Nondeletion Type." *Online Mendelian Inheritance of Man*. <<http://www.ncbi.nlm.nih.gov/entrez/dispmim.cgi?id=301040>>. (1998).
- Children's Hospital Oakland, Northern California Comprehensive Thalassemia Center website. <<http://www.thalassemia.com>>.
- Cooley's Anemia Foundation, Inc. website. <<http://www.thalassemia.org/gohome.html>>.
- Joint Center for Sickle Cell and Thalassemic Disorders website. <<http://cancer.mgh.harvard.edu/medOnc/sickle.htm>>.

OTHER

- Bojanowski J. "Alpha Thalassemia Major: The Possibility of Long-Term Survival." Pamphlet from the Northern California Comprehensive Thalassemia Center. (1999).

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A thallium scan showing many images of a human heart with cold spots. (*Custom Medical Stock Photo. Reproduced by permission.*)

provides. In other words, the test may be better able to detect a problem and to differentiate one condition from another. A thallium heart scan may more accurately detect ischemic heart disease. This type of scan is most likely to be helpful in cases in which the exercise test is inconclusive, the patient cannot exercise adequately, or a quantitative evaluation of blood flow is required. In addition to evaluating coronary artery disease, thallium scanning can help to evaluate blood flow following treatment of clogged arteries with **coronary artery bypass graft surgery** or **angioplasty**.

Precautions

Radioisotopes such as thallium 201 should not be administered during **pregnancy** because they may be harmful to the fetus.

Description

The thallium scan is performed in conjunction with an exercise **stress test**. At the end of the **stress test** (once the patient has reached the highest level of exercise he or she can comfortably achieve), a small amount of the harmless radioisotope thallium 201 is injected into the patient's bloodstream through an intravenous (IV) line. The patient then lies down under a special camera called a gamma scintillation camera, which makes photographs from the gamma rays emitted by the thallium.

Purpose

A thallium heart scan is used to evaluate the blood supply to the heart muscle. It can identify areas of the heart that may have a poor blood supply as a result of damage from a previous **heart attack** or blocked coronary arteries. While **exercise** testing has long been a standard examination in the diagnosis of **coronary artery disease**, in some cases, the thallium scan may be more sensitive and more specific in the information it

The thallium attaches itself to the red blood cells and is carried throughout the body in the bloodstream. It enters the heart muscle by way of the coronary arteries and collects in the cells of the heart muscle that come into contact with the blood. Since the thallium can reach only those areas of the heart with an adequate blood supply, no thallium will show up in poorly perfused areas of the heart (perfusion defects). These areas show up as "cold spots" on the thallium scan. The patient may then be given a second injection of thallium. Several hours later, the gamma scintillation camera takes more pictures in order to get an image of the heart when the patient is at rest.

Cold spots that appear at rest as well as during exercise often indicate areas where the heart tissue has been damaged (for example, as a result of a prior heart attack). Sometimes perfusion is adequate during rest but cold spots appear during exercise, when the heart has to work harder and has a greater demand for blood. This can indicate some blockage in the coronary arteries, producing a condition called **ischemia**. In ischemia, the heart temporarily does not get enough blood flow. People with perfusion defects, especially perfusion defects that appear only during exercise, have the greatest risk of such future cardiac events as heart attacks.

In recent years, there have been improvements in heart scanning. Many centers now use a single photon emission computed tomographic (SPECT) camera, which provides a clearer image. Some centers also use a type of radioactive chemical called sestamibi. Sestamibi is used along with a radioactive compound called technetium. While thallium may still be better for some uses, such as providing a better image of the heart muscle itself, sestamibi may produce clearer images in overweight patients and is more useful in assessing how well the heart pumps blood.

If the patient is unable to exercise because of another medical condition, such as arthritis, he or she may be given a drug to mimic the effects of exercise on the heart. Some of these drugs include dipyridamole (Persantine), which dilates the coronary arteries; and dobutamine, which increases blood flow through the heart muscle.

Preparation

Patients should not drink alcoholic or caffeinated beverages, smoke tobacco, or ingest other nicotine products for 24 hours before the test. These substances can affect test results. Patients should also not eat anything for at least three hours before the test. They may also be instructed to stop taking certain medications during the test that may interfere with test results.

KEY TERMS

Angioplasty—The reconstruction of damaged blood vessels.

Coronary bypass surgery—Surgery in which a section of blood vessel is used to bypass a blocked coronary artery and restore an adequate blood supply to the heart muscle.

Perfusion—The passage of fluid (such as blood) through a specific organ or area of the body (such as the heart).

Radioisotope—A radioactive form of a chemical element, which is used in medicine for therapeutic or diagnostic purposes.

Aftercare

In some cases, another set of scans may be needed, and the patient may be given special instructions regarding eating and test preparation. Otherwise, the patient is free to return to his or her normal daily activities.

Risks

Radioisotopes such as thallium 201 should not be administered during pregnancy because they may be harmful to the fetus.

Normal results

A normal thallium scan shows healthy blood flow through the coronary arteries and normal perfusion of the heart muscle, without cold spots, both at rest and during exercise.

Abnormal results

Cold spots on the scan, where no thallium shows up, indicate areas of the heart that are not getting an adequate supply of blood. Cold spots appearing both at rest and during exercise may indicate areas where the heart tissue has been damaged. However, "reversible" cold spots appearing only during exercise usually indicate some blockage of the coronary arteries.

Resources

BOOKS

"Myocardial Perfusion Scan." In *The Patient's Guide to Medical Tests*, ed. Barry L. Zaret, et al. Boston: Houghton Mifflin, 1997.

PERIODICALS

- Christian, T. F., et al. "Exercise Tomographic Thallium-201 Imaging in Patients with Severe Coronary Artery Disease and Normal Electrocardiograms." *Annals of Internal Medicine* 121 (1 Dec. 1994): 825-832.
- Rivitz, S. Mitchell, and Salvatore A. DeLuca. "Perfusion Imaging in Ischemic Heart Disease." *American Family Physician* 48 (1 Nov. 1993): 1071- 1078.
- Simon, Harvey B., ed. "Cardiac Stress Testing: New Variations on an Old Theme." *Harvard Men's Health Watch* 1, no. 8 (Mar. 1997): 1-4.
- Wiley Jr., John P. "Phenomena, Comment and Notes." *Smithsonian* (Oct. 1995): 28-31.
- Zabel, M. K., and R. M. Califf. "The Value of Exercise Thallium Imaging." *Annals of Internal Medicine* 121 (1994): 891-893.

ORGANIZATIONS

- American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.
- National Heart, Lung and Blood Institute. P.O. Box 30105, Bethesda, MD 20824-0105. (301) 251-1222. <<http://www.nhlbi.nih.gov>>.

Robert Scott Dinsmoor

KEY TERMS

Apperception—The process of understanding through linkage with previous experience.

Human potential movement—A movement in psychotherapy that began in the 1960s and emphasized maximizing the potential of each participant through such techniques as group therapy and sensitivity training.

Projective test—A type of psychological test that assesses a person's thinking patterns, observational ability, feelings, and attitudes on the basis of responses to ambiguous test materials. It is not intended to diagnose psychiatric disorders.

II, however, the TAT was used by psychoanalysts and clinicians from other schools of thought to evaluate emotionally disturbed patients. Another shift took place in the 1970s, when the influence of the human potential movement led many psychologists to emphasize the usefulness of the TAT in assessment services—that is, using the test to help clients understand themselves better and stimulate their personal growth.

The TAT is widely used to research certain topics in psychology, such as dreams and fantasies, mate selection, the factors that motivate people's choice of occupations, and similar subjects. It is sometimes used in psychiatric evaluations to assess disordered thinking and in forensic examinations to evaluate crime suspects, even though it is not a diagnostic test. As mentioned earlier, the TAT can be used to help people understand their own personality in greater depth and build on that knowledge in making important life decisions. Lastly, it is sometimes used as a screener in psychological evaluations of candidates for high-stress occupations (law enforcement, the military, religious ministry, etc.).

Precautions

The TAT has been criticized for its lack of a standardized method of administration as well as the lack of standard norms for interpretation. Studies of the interactions between examiners and test subjects have found that the race, sex, and social class of both participants influence both the stories that are told and the way the stories are interpreted by the examiner. Attempts have been made to design sets of TAT cards for African American and for elderly test subjects, but the results have not been encouraging. In addition, the 31 standard pictures have been criticized for being too gloomy or depressing,

Thematic apperception test

Definition

The thematic apperception test (TAT) is a projective personality test that was designed at Harvard in the 1930s by Christiana D. Morgan and Henry A. Murray. Along with the MMPI and the Rorschach, the TAT is one of the most widely used **psychological tests**. A projective test is one in which a person's patterns of thought, attitudes, observational capacity, and emotional responses are evaluated on the basis of responses to ambiguous test materials. The TAT consists of 31 pictures that depict a variety of social and interpersonal situations. The subject is asked to tell a story about each picture to the examiner. Of the 31 pictures, 10 are gender-specific while 21 others can be used with adults of either sex and with children. As of 2001, the TAT is distributed by Harcourt Brace Educational Measurement.

Purpose

The original purpose of the TAT was to reveal the underlying dynamics of the subject's personality, such as internal conflicts, dominant drives and interests, motives, etc. The specific motives that the TAT assesses include the need for achievement, need for power, the need for intimacy, and problem-solving abilities. After World War

and therefore limiting the range of personality characteristics that the test can assess.

Description

There is no standardized procedure or set of cards for administering the TAT, except that it is a one-on-one test. It cannot be administered to groups. In one common method of administration, the examiner shows the subject only 10 of the 31 cards at each of two sessions. The sessions are not timed, but average about an hour in length.

Preparation

There is no specific preparation necessary before taking the TAT, although most examiners prefer to schedule sessions (if there is more than one) over two days.

Risks

The chief risks involved in taking the TAT are a bad "fit" between the examiner and the test subject, and misuse of the results.

Normal results

Since the TAT is used primarily for personality assessment rather than diagnosis of mental disorders, it does not yield a "score" in the usual sense.

Resources

BOOKS

- Arbisi, Paul A. "The Senior Apperception Technique." In *The Thirteenth Mental Measurements Yearbook*, ed. J. C. Impara and B. S. Plake (Lincoln, NE: The Buros Institute of Mental Measurements, The University of Nebraska-Lincoln, 1998).
- Dana, Richard H. "Thematic Apperception Test." In *International Encyclopedia of Psychiatry, Psychology, Psychoanalysis, & Neurology*, vol. 11, ed. Benjamin B. Wolman. New York: Aesculapius Publishers, Inc., 1977.
- Geiser, Lon, and Morris I. Stein. *Evocative Images: The Thematic Apperception Test and the Art of Projection*. Washington, DC: American Psychological Association, 1999.
- Sweetland, R. C., PhD, and D. J. Keyser, PhD, eds. *Tests: A Comprehensive Reference for Assessments in Psychology, Education, and Business*, 2nd edition. Kansas City, KS: Test Corporation of America, 1986.

ORGANIZATION

American Psychological Association. 750 First Street, NE, Washington, DC 20002. (800) 374-2721. <<http://www.apa.org>>.

Rebecca J. Frey, PhD

Therapeutic abortion see **Abortion, therapeutic**

Therapeutic baths

Definition

Bathing the skin in a variety of preparations in order to remove crusts, scales, and old medications or to relieve inflammation and itching is called a therapeutic bath.

Purpose

Baths or soaks (balneotherapy) are an easy way to treat a variety of skin disorders involving large areas of the skin. They relieve general aches and pains and can ease dry or oily, inflamed or itchy skin. Hot baths are relaxing and stimulating; cool baths can reduce inflammation.

Therapeutic baths are useful for itchy skin, hives, sunburn, chafing, poison ivy and oak, eczema, skin irritation, and dry skin.

Precautions

The temperature of the water should be comfortable. The bath should not last longer than 20–30 minutes because of the tendency of these soaks to soften and wear away the skin.

A bath mat should be used, since medications may cause the floor of the tub to be slippery.

Eczema and other skin diseases can be treated with an ointment that contains a derivative of coal tar. Parts of the coal tar are volatile, so the bathroom should be well ventilated.

Description

The tub should be filled half-full with water at a comfortable temperature. The water should not be allowed to cool too much. If an emollient action is needed, the patient should apply a lubricating agent to the skin after the bath, since this increases hydration.

Different types of therapeutic baths are used for different conditions:

Types Of Therapeutic Baths

Bath Solution	Uses/benefits
Aveeno/Oatmeal	Soothes irritated skin; lubricates and softens dry skin
Corn starch	Soothes irritated skin
Potassium permanganate	Treats infected skin areas; cleans and disinfects
Saline	Cools and cleanses skin; decreases skin irritation
Sodium bicarbonate	Cools skin; relieves skin irritation

KEY TERMS

Eczema—An inflammation of the skin that usually itches and sometimes forms scales or blisters.

- colloidal oatmeal (oatmeal that has been ground into a fine powder, e.g. Aveeno) coats, soothes, stops itch and doesn't dry out the skin
- potassium permanganate—a dark purple salt—makes a good disinfectant
- bath oils are used to ease itchy skin and eczema as an emollient
- cornstarch is a soothing, drying bath for itchy skin
- sodium bicarbonate can be cooling for hot, dry skin conditions
- saline (salt) water baths are used to treat lesions scattered over the body

Preparation

Keep the room warm to minimize temperature fluctuations.

Aftercare

After the bath, the skin should be blotted (not rubbed) carefully with a towel. The patient should wear loose, light clothing after the bath.

Resources

BOOKS

Boyle, Wade, and Andre Saine. *Lectures in Naturopathic Hydrotherapy*. East Palestine, OH: Buckeye Naturopathic Press, 1988.

Carol A. Turkington

Therapeutic drug monitoring see **Drug therapy monitoring**

Therapeutic massage see **Massage**

Therapeutic touch

Definition

Therapeutic touch, or TT, is a noninvasive method of healing that was derived from an ancient laying-on of

hands technique. In TT, the practitioner alters the patient's energy field through an energy transfer that moves from the hands of the practitioner to the patient.

Origins

Therapeutic touch was developed in 1972 by Dora Kunz, a psychic healer, and Dolores Krieger, Ph.D., R.N., a nurse and professor of nursing at New York University. The year before, in 1971, when Krieger was working as a registered nurse in a hospital, she became very frustrated when one of her patients, a 30-year-old female, lay dying from a gallbladder condition. In desperation, she tried what she was learning from Kunz. Within one treatment, the patient's condition began to shift and she lived, surprising the other hospital staff. Krieger and Kunz met during the study of Oskar Estebany, a world-renowned healer. They had invited Estebany to form a study for three years, observing his work with patients. In this study, Estebany practiced laying-on of hands healing on various patients. Using her psychic and intuitive abilities, Kunz would observe and assist in the healing, while Krieger recorded the activities of the healing session and created profiles of the patients.

As the study progressed, Kunz began teaching Krieger how to heal, based on her perceptions of Estebany's healing techniques. During her research of ancient healing methods, Krieger concluded that the energy transfer between the healer and the healee that takes place in a TT session is *prana*, an Eastern Indian concept representing energy, vitality, and vigor. Krieger then combined her research with Kunz's techniques to create TT.

TT was initially developed for persons in the health professions, but is currently taught worldwide to anyone who is interested in learning the technique. As of 1998, an estimated 100,000 people around the world have been trained in TT; 43,000 of those persons are health care professionals, many of whom use TT in conjunction with traditional medicine, as well as osteopathic, **chiropractic**, naturopathic, and homeopathic therapies. TT is taught in over 100 colleges, universities, and medical schools.

Benefits

The major effects of TT are relaxation, **pain** reduction, accelerated healing, and alleviation of psychosomatic symptoms. Studies have shown that TT has a beneficial effect on the blood as it has the ability to raise hemoglobin values. It also affects brain waves to induce a relaxed state. TT can induce the relaxation response often within five minutes.

Krieger has said that it is not individual illnesses that validate the effectiveness of TT, but rather, it is ques-

tioned which systems are most sensitive to TT. She and others have found that the most sensitive is the autonomic nervous system (ANS), which, for example, controls urination. The ANS is followed by dysfunctions of lymphatic and circulatory systems, and then finally musculoskeletal systems. In addition, the female endocrine system is more sensitive to TT than the corresponding male system. Thus, TT helps with **dysmenorrhea**, **amenorrhea**, problems with **contraception**, and the course of **pregnancy**.

TT is reported to have a positive effect on the immune system and thus accelerates the healing of **wounds**. Nurses use therapeutic touch in operating rooms to relax patients before surgery and in recovery rooms on postoperative patients to help speed the healing process. TT is used in the treatment of terminally ill patients, such as those with **cancer** and autoimmune deficiency syndrome (**AIDS**), to relieve **anxiety** and **stress**, create peace of mind, and reduce pain.

Many nurses use TT in the nursery. The conditions of many premature babies who received TT reportedly improved rapidly. TT has been used to calm colicky infants, assist women in **childbirth**, and increase milk let-down in breast-feeding mothers.

Other claims of TT include relief of acute pain, nausea, **diarrhea**, tension and migraine headaches, **fever**, and joint and tissue swelling. TT has been used to treat thyroid imbalances, ulcers, psychosomatic illnesses, **pre-menstrual syndrome**, **Alzheimer's disease**, **stroke** and **coma**, **multiple sclerosis**, **measles**, infections, **asthma**, and bone and muscle injuries.

Therapeutic touch is performed in many different locations, including healing centers, delivery rooms, hospitals, hospice settings, accident scenes, homes, and schools.

Description

Therapeutic touch treats the whole person: relaxes the mind, heals the body, and soothes the spirit. The principle behind it is that it does not stop at the skin. The human body extends an energy field, or aura, several inches to several feet from the body. When illness occurs, it creates a disturbance or blockage in the vital energy field. The TT practitioner uses her/his hands to sense the blockage or disturbance. In a series of gentle strokes, the healer removes the disturbance and rebalances the energy to restore health.

The TT session generally lasts about 20–30 minutes. Although the name is therapeutic touch, there is generally no touching of the physical body, only the energetic body or field. It is usually performed on fully clothed patients who are either lying down on a flat surface or sitting up in a chair.

Each session consists of five steps. Before the session begins, the practitioner enters a state of quiet **meditation** in which he/she becomes centered and grounded in order to establish intent for the healing session and to garner the compassion necessary to heal.

The second step involves the assessment of the person's vital energy field. During this step, the practitioner places the palms of his/her hands 2–3 in (5–8 cm) from the patient's body and sweeps them over the energy field in slow, gentle strokes beginning at the head and moving toward the feet. The practitioner might feel heat, coolness, heaviness, pressure, or a prickly or tingling sensation. These cues, as they are called, each signal a blockage or disturbance in the field.

To remove these blockages and restore balance to the body, the practitioner then performs a series of downward sweeping movements to clear away any energy congestion and smooth the energy field. This is known as the unruffling process and is generally performed from head to feet. To prevent any energy from clinging to him/her, the practitioner shakes his/her hands after each stroke.

During the next phase, the practitioner acts as a conduit to transfer energy to the patient. The energy used is not solely the energy of the practitioner. The practitioner relies on a universal source of energy so as not to deplete his/her own supply. In short, the healer acts as an energy support system until the patient's immune system is able to take over.

The practitioner then smoothes the field to balance the energy and create a symmetrical flow. When the session is over, it is recommended that the patient relax for 10–15 minutes in order for the energies to stabilize.

Side effects

The side effects reported occur when an excess of energy enters the body for an extended period of time creating restlessness, irritability, and hostility, or increasing anxiety and pain. **Burns** are sensitive to therapeutic touch, and it is recommended that TT be performed on burned tissue for short periods, generally two to three minutes at a time.

Research and general acceptance

Therapeutic touch is not generally accepted by Western medical professionals. Basic and anecdotal research has been performed on TT since its development in 1972, although little quantitative research has been carried out. It is based on a theory derived from formal research. It began as the basis of Dolores Krieger's postdoctoral research.

DOLORES KRIEGER (1935–)

Dolores Krieger, a prominent professor of nursing at the New York University Division of Nursing, conceived of therapeutic touch as a healing technique in the early 1970s and introduced the therapy in 1972. Therapeutic touch rarely consists of physical contact with the patient. The practitioner focuses positive energy through the hands, which are held or waved two to three inches away from the patient, and directs it towards the patient's energy field. Krieger developed the technique along with a colleague, Dora Van Gelder Kunz, who is believed to be clairvoyant. They initially taught the system to graduate students at the nursing school, and it evolved from that basis. Since the introduction of therapeutic touch, Krieger traveled the world in teaching the technique before she retired as professor emerita at the university. An estimated 70,000 nurses were trained by Krieger and Kunz.

In 1981 Dr. Krieger published *Foundations for Holistic Health Nursing Practices*. She later published a manual, *The Therapeutic Touch: How to Use Your Hands to Help or to Heal*, in 1992.

Dolores Krieger has performed extensive research on TT, including with pregnant women, and has noted that the following changes occur in a patient after short, consistent treatment: relaxation within the first five minutes of a session, a reduction of pain, and the acceleration of the healing process.

One study was created to determine the effect TT would have on wounds that resulted from a biopsy of the upper arm. Forty-four patients placed their injured arms through a hole in a door. Twenty-two of them received TT on their arms. The other half received no treatment. The wounds treated with TT healed more quickly than the wounds that received no treatment.

In 1998, a study was performed on 27 patients with **osteoarthritis** in at least one knee. For six weeks, the patients were treated with therapeutic touch, mock therapeutic touch, or standard care. According to *The Journal of Family Practice*, the journal who published the study, the results showed that the group who had received TT had "significantly decreased pain and improved function as compared with both the placebo and control groups."

Therapeutic touch can be combined with a number of different therapies, including **acupressure**, massage, mental imagery, physical therapy, and **yoga**. When combined with massage and physiotherapy, TT may reduce tension headaches, back pain, stress-related problems, circulatory problems, and **constipation**. **Shiatsu** and TT may help **sinusitis**, digestive disorders, muscle cramps,

Krieger became embroiled in controversy over the potential benefits of therapeutic touch technique between 1996–98, when nine-year-old schoolgirl Emily Rosa challenged the validity of the therapy with a simple experiment. She gathered 21 practitioners and through a covered box held her hand over one of the practitioner's own to test whether they could sense her energy field. Only 44% of the time were the practitioners able to determine which of their hands that Rosa's was hovering over. Although Rosa contacted Krieger in 1997, Krieger refused to meet with her, refused to participate in Rosa's experiment, and disputed the relevancy of an elementary school student's observations. Krieger holds both an R.N. and a Ph.D. degree and dismissed the validity of the experiment due to the student's and practitioners' lack of experience.

Krieger continues to promote her technique; her latest book, *Living the Therapeutic Touch*, was published by in 1999.

menstrual difficulties, and **insomnia**. Yoga and TT may be beneficial in the treatment of **bronchitis**, asthma, blood pressure, **fatigue**, and anxiety.

TT is practiced in over 70 countries worldwide: by Egyptians and Israelis during fighting in the Gaza Strip; in South Africa to reduce racial strife; and in Poland, Thailand, and the former Soviet Union.

Training and certification

Therapeutic touch is taught at over 100 universities and nursing and medical schools around the United States and Canada. Although it was developed primarily for nurses, anyone can learn TT.

State laws vary regarding the practice of TT. In general, laypersons are allowed to practice TT within their families. Therapeutic touch is considered an extension of health care skills, so most health care professionals are covered under the state medical practice act.

Many hospitals have established policies allowing nurses and staff to perform TT on patients at no extra charge. The American Nurse's Association often holds workshops on TT at national conventions. Therapeutic touch classes are often held for the general public through community education, healing clinics, and holistic schools.

Resources

BOOKS

- Krieger, Dolores, Ph.D., R.N. *Accepting Your Power to Heal. The Personal Practice of Therapeutic Touch.* Bear & Company, 1993.
- Krieger, Dolores, Ph.D., R.N. *The Therapeutic Touch. How to Use Your Hands to Help or to Heal.* New York: Prentice Hall Press, 1979.
- Macrae, Janet, Ph.D., R.N. *Therapeutic Touch: A Practical Guide.* New York: Knopf, 1998.

PERIODICALS

- Rosa, Linda, Emily Rosa, Larry Sarner, and Stephen Barrett. "A Close Look At Therapeutic Touch." *JAMA, The Journal of the American Medical Association* (April 1, 1998): 1005–11.

OTHER

- The Nurse Healers Professional Associates International (NH-PAI), the Official Organization of Therapeutic Touch. 3760 S. Highland Dr. Salt Lake City, UT 84106. (801) 273–3399. nhpai@therapeutic-touch.org. <<http://www.therapeutic-touch.org>>

Jennifer Wurges

Thiabendazole see **Antihelminthic drugs**

Thiamine deficiency see **Beriberi**

Thoracentesis

Definition

Also known as pleural fluid analysis, thoracentesis is a procedure that removes fluid or air from the chest through a needle or tube.

Purpose

The lungs are lined on the outside with two thin layers of tissue called pleura. The space between these two layers is called the pleural space. Normally, there is only a small amount of lubricating fluid in this space. Liquid and/or air accumulates in this space between the lungs and the ribs from many conditions. The liquid is called a **pleural effusion**; the air is called a **pneumothorax**. Most pleural effusions are complications emanating from metastatic malignancy (movement of **cancer** cells from one part of the body to another). Most malignant pleural effusions are detected and controlled by thoracentesis. Thoracentesis is also performed as a diagnostic measure. In these cases, only small amounts of material need to be withdrawn.

Symptoms of a pleural effusion include breathing difficulty, chest **pain**, **fever**, weight loss, **cough**, and **edema**. Removal of air is often an emergency procedure to prevent suffocation from pressure on the lungs. Negative air pressure within the chest cavity allows normal respiration. The accumulation of air or fluid within the pleural space can eliminate these normal conditions and disrupt breathing and the movement of air within the chest cavity. Fluid removal is performed to reduce the pressure in the pleural space and to analyze the liquid. In addition, thoracentesis was traditionally used to remove blood from the chest cavity. This is rare now that the placement of a thoracostomy tube has proven to be a more effective and safer method.

Thoracentesis often provides immediate abatement of symptoms. However, fluid often begins to reaccumulate. A majority of patients will ultimately require additional therapy beyond a simple thoracentesis.

There are two types of liquid in the pleural space, one having more protein in it than the other. More watery liquids are called transudates; thicker fluids are called exudates. On the basis of this difference, the cause of the effusion can more easily be determined.

Transudates

Thin, watery fluid oozes into the chest either because back pressure from circulation squeezes it out or because the blood has lost some of its osmotic pressure.

- Heart failure creates back pressure in the veins as blood must wait to be pumped through the heart.
- **A pulmonary embolism** is a blood clot in the lung. It will create back pressure in the blood flow and also damage a part of the lung so that it leaks fluid.
- Cirrhosis is a sick, scarred liver that both fails to make enough protein for the blood and also restricts the flow of blood through it.
- Nephrosis is a collection of kidney disorders that change the osmotic pressure of blood and allow liquid to seep into body cavities.
- Myxedema is a disease caused by too little thyroid hormone.

Exudates

Thicker, more viscous fluid is usually due to greater damage to tissues, allowing blood proteins as well as water to seep out.

- Pneumonia, caused by viruses and by bacteria, damages lung tissue and can open the way for exudates to enter the pleural space.
- Tuberculosis can infect the pleura as well as the lungs and cause them to leak liquid.

- Cancers of many types settle in the lungs or the pleura and leak liquids from their surface.
- Depending upon its size and the amount of damage it has done, a pulmonary **embolism** can also produce an exudate.
- Several drugs can damage the lung linings as an unexpected side effect. None of these drugs is commonly used.
- An esophagus perforated by cancer, trauma, or other conditions can spill liquids and even food into the chest. The irritation creates an exudate in the pleural space.
- Pancreatic disease can cause massive fluid in the abdomen, which can then find its way into the chest.
- Pericarditis is an inflammation of the sac that contains the heart. It can ooze fluid from both sides—into the heart's space and into the chest.
- Radiation to treat cancer or from accidents with radioactive materials can damage the pleura and lead to exudates.
- A wide variety of autoimmune diseases attacks the pleura. Among these are **rheumatoid arthritis** and **systemic lupus erythematosus** (SLE).
- Many other rare conditions can also lead to exudates.

Blood

Blood in the chest (hemothorax) is infrequently seen outside of two conditions:

- major trauma can sever blood vessels in the chest, causing them to bleed into the pleural space
- cancers can ooze blood as well as fluid. They do not usually bleed massively

Chyle

Occasionally, the liquid that comes out of the chest is neither transparent nor bloody, but milky. This is due to a tear of the large lymphatic channel—the thoracic duct carrying lymph fluid from the intestines to the heart. It is milky because it is transporting fats absorbed in the process of digestion. The major causes of chylothorax are:

- injury from major trauma, such as an automobile accident
- cancers eroding into the thoracic duct

Air

Air in the pleural space is called pneumothorax. Air can enter the pleural space either directly through a hole between the ribs or from a hole in the lungs. Holes in the lungs are sometimes spontaneous, sometimes traumatic, and sometimes the result of disease opening a communication to the air in the lung.

Precautions

Care must be taken not to puncture the lung when inserting the needle. Thoracentesis should never be performed by inserting the needle through an area with an infection. An alternative site needs to be found in these cases. Patients who are on anticoagulant drugs should be carefully considered for the procedure.

Description

The usual place to tap the chest is below the armpit (axilla). Under sterile conditions and local anesthesia, a needle, a through-the-needle-catheter, or an over-the-needle catheter may be used to perform the procedure. Overall, the catheter techniques may be safer. Fluid or air is withdrawn. Fluid is sent to the laboratory for analysis. If the air or fluid continue to accumulate, a tube is left in place and attached to a one-way system so that it can drain without sucking air into the chest.

Preparation

The location of the fluid is pinpointed through x ray or ultrasound. Ultrasound is a more accurate method when the effusion is small. A sedative may be administered in some cases but is generally not recommended. Oxygen should be given to the patient.

Aftercare

As long as the tube is in the chest, the patient must lie still. After it is removed, x rays will determine if the effusion or air is reaccumulating—though some researchers and clinicians believe chest x rays do not need to be performed after routine thoracentesis.

Risks

Reaccumulation of fluid or air is a possible complications, as are hypovolemic **shock** (shock caused by a lack of circulating blood) and infection. Patients are at increased risk for poor outcomes if they have a recent history of anticoagulant use, have very small effusions, have significant amounts of fluid, have poor health leading into this condition, have positive airway pressure, and have adhesions in the pleural space. A pneumothorax can sometimes be caused by the thoracentesis procedure. The use of ultrasound to guide the procedure can reduce the risk of pneumothorax.

Thoracentesis can also result in hemothorax, or bleeding within the thorax. In addition, such internal structures, as the diaphragm, spleen, or liver, can be damaged by needle insertion. Repeat thoracenteses can increase the risk of developing hypoproteinemia (a decrease in the amount of protein in the blood).

KEY TERMS

Axilla—Armpit.

Catheter—A tube that is moved through the body for removing or injecting fluids into body cavities.

Hypovolemic shock—Shock caused by a lack of circulating blood.

Osmotic pressure—The pressure in a liquid exerted by chemicals dissolved in it. It forces a balancing of water in proportion to the amount of dissolved chemicals in two compartments separated by a semi-permeable membrane.

Pleura—Two thin layers lining the lungs on the outside.

Resources

BOOKS

Celli, R. Bartolome. "Diseases of the Diaphragm, Chest Wall, Pleura and Mediastinum." In *Cecil Textbook of Medicine*, edited by J. Claude Bennett. Philadelphia: W. B. Saunders, 2000.

Clinical Oncology edited by Martin D. Abeloff, et al. New York: Churchill Livingstone, 2000.

Miller, Don R. "Pleural Effusion and Empyema Thoracis." In *Conn's Current Therapy*, edited by Robert E. Rakel, et al. Philadelphia: W.B. Saunders, 1998.

Ross, David S. "Thoracentesis." In *Clinical Procedures in Medicine*, edited by James R. Roberts, et al. Philadelphia: W.B. Saunders, 1998.

PERIODICALS

Colt, Henri G. "Factors Contributing to Pneumothorax After Thoracentesis." *Chest* 117 (February 2000).

Petersen, W.G. "Limited Utility of Chest Radiograph After Thoracentesis." *Chest* 117 (April 2000): 1038-1042.

Mark A. Mitchell

Thoracic aortic aneurysm see **Aortic aneurysm**

Thoracic empyema see **Empyema**

Thoracic outlet syndrome

Definition

Thoracic outlet syndromes are a group of disorders that cause **pain** and abnormal nerve sensations in the neck, shoulder, arm, and/or hand.

Description

The thoracic outlet is an area at the top of the rib cage, between the neck and the chest. Several anatomical structures pass through this area, including the esophagus, trachea, and nerves and blood vessels that lead to the arm and neck region. The area contains the first rib; collar bone (clavicle); the arteries beneath the collar bone (subclavian artery), which supply blood to the arms, a network of nerves leading to the arms (brachial plexus); and the top of the lungs.

Pain and other symptoms occur when the nerves or blood vessels in this area are compressed. The likelihood of blood vessels or nerves in the thoracic outlet being compressed increases with increased size of body tissues in this area or with decreased size of the thoracic outlet. The pain of thoracic outlet syndrome is sometimes confused with the pain of **angina** that indicates heart problems. The two conditions can be distinguished from each other because the pain of thoracic outlet syndrome does not appear or increase when walking, while the pain of angina does. Also, the pain of thoracic outlet syndrome usually increases if the affected arm is raised, which does not happen in cases of angina.

There are three types of thoracic outlet syndromes:

- True neurogenic thoracic outlet syndrome is caused by a compression of the nerves in the brachial plexus. Abnormal muscle or other tissue causes the problem.
- Arterial thoracic outlet syndrome is caused by compression of the major artery leading to the arm, usually by a rib.
- Disputed thoracic outlet syndrome describes patients who have chronic pain in the shoulders and arms and have no other disease or syndrome, but the underlying cause cannot be accurately determined.

Thoracic outlet syndrome is most common in women who are 35–55 years of age.

Causes and symptoms

Compression of blood vessels or nerves in the thoracic outlet causes pain and/or abnormal nerve sensations. Compression usually occurs at the location where the blood vessels and nerves pass out of the thoracic outlet into the arm.

There are several factors that contribute to a person developing thoracic outlet syndrome. Poor posture is a major cause and is easy to treat. A person's physical makeup also can cause thoracic outlet syndrome. For example, abnormalities of certain anatomical structures can put pressure on blood vessels or nerves. Typical abnormalities that can cause problems are malformed

ribs and too narrow an opening between the collar bone and the first rib.

The main symptom is pain in the affected area. The patient can also develop weakness in the arm and hands, tingling nerve sensations, and a condition called Raynaud's syndrome. In Raynaud's syndrome, exposure to cold causes small arteries in the fingers to contract, cutting off blood flow. This causes the fingers to turn pale. In very severe cases of blood vessel compression, **gangrene** can result. Gangrene is the **death** of tissue caused by the blood supply being completely cut off.

In the case of arterial thoracic outlet syndrome, the artery beneath the collar bone leading to the arm is compressed, causing the artery to increase in size. Blood clots (thrombi) may form in the blood vessel. When blood vessels are compressed, the hands, arms, and shoulders do not receive proper blood supply. They can swell and turn blue from a lack of blood.

In the case of true neurogenic thoracic outlet syndrome, the nerves most affected are those of the network of nerves supplying the chest, shoulder, arm, forearm, and hand (brachial plexus). When a nerve is affected in thoracic outlet syndrome it produces a tingling sensation (paresthesia). It can also cause weakness in the hand and reduced sensation in the palm and fingers.

Diagnosis

There are no specific diagnostic tests for thoracic outlet syndromes. The diagnosis is made by ruling out other diseases and by observing the patient. Two nonspecific tests that can suggest the presence of thoracic outlet syndrome are the Adson test and the Allen test. In the Adson test, the patient takes a deep breath and tilts his or her head back and turns it to one side. The physician tests to see if the strength of the patient's pulse is reduced in the wrist on the arm on the opposite side of the head turn. In the Allen test, the arm in which the patient is experiencing symptoms is raised and rotated while the head is turned to the opposite side. The physician tests to see if the pulse strength at the wrist is reduced. If the strength of the pulse is reduced in either of these two tests it indicates compression of the subclavian artery.

Occasionally, examination with a stethoscope may reveal abnormal sounds in affected blood vessels. X rays can reveal constrictions in blood vessels if a special dye is injected into the blood stream to make the blood vessels visible (**angiography**).

Certain tests are available to help with the diagnosis of nerve compression. These include the nerve conduction velocity test and somatosensory evoked potential test. In the nerve conduction velocity test, electrodes are placed at

various locations on the skin along a nerve that is being tested. A mild electrical impulse is delivered through an electrode at one end of the nerve and the electrical activity is recorded by the other electrodes. The time it takes for the electrical impulse to travel down the nerve from the stimulating electrodes to the recording electrodes is used to calculate the nerve conduction velocity. This can be used to determine if any nerve damage exists.

In a somatosensory evoked potential test, electrodes are placed on the skin at the scalp, neck, shoulder, and wrist. A mild electrical impulse is delivered at the wrist, and a recording is made of the response by the brain and spinal cord. This test also can determine the presence of nerve damage.

Treatment

The main treatment for thoracic outlet syndrome is physical therapy. Exercises aimed at improving the posture of the affected person are also useful. In some cases, surgery can be performed to remove the cervical rib if this is causing the problem and physical therapy has failed to work. However, surgery is generally not used to treat thoracic outlet syndrome.

Prognosis

Treatment of true neurogenic and arterial thoracic outlet syndromes is usually successful. Treatment of disputed thoracic outlet syndrome is often unsuccessful. This may relate to the uncertainty of the underlying cause of the pain.

Resources

BOOKS

- Berkow, Robert, ed. *Merck Manual of Medical Information*. Whitehouse Station, NJ: Merck Research Laboratories, 1997.
- Braunwald, E. *Heart Disease*. Philadelphia: W. B. Saunders Co., 1997.
- Harrison's Principles of Internal Medicine*. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

John T. Lohr, PhD

Thoracic surgery

Definition

Thoracic surgery is the repair of organs located in the thorax, or chest. The thoracic cavity lies between the

KEY TERMS

Angina—A severe constricting pain in the chest, usually caused by a lack of oxygen to the heart.

Neurogenic—Caused by nerves; originating in the nerves.

Subclavian—Located beneath the collarbone (clavicle).

neck and the diaphragm, and contains the heart and lungs (cardiopulmonary system), the esophagus, trachea, pleura, mediastinum, chest wall, and diaphragm.

Purpose

Thoracic surgery repairs diseased or injured organs and tissues in the thoracic cavity. General thoracic surgery deals specifically with disorders of the lungs and esophagus. Cardiothoracic surgery also encompasses disorders of the heart and pericardium. Blunt chest trauma, reflux esophagitis, **esophageal cancer**, **lung transplantation**, **lung cancer**, and **emphysema** are just a few of the many clinical indications for thoracic surgery.

Precautions

Patients who have blood-clotting problems (coagulopathies), and who have had previous standard thoracic surgery may not be good candidates for video-assisted thoracic surgery (VATS). Because VATS requires the collapse of one lung, potential patients should have adequate respiratory function to maintain oxygenation during the procedure.

Description

Thoracic surgery is usually performed by a surgeon who specializes in either general thoracic surgery or cardiothoracic surgery. The patient is placed under general anesthesia and endotracheally intubated for the procedure. The procedure followed varies according to the purpose of the surgery. An incision that opens the chest (thoracotomy) is frequently performed to give the surgeon access to the thoracic cavity. Commonly, the incision is made beginning on the back under the shoulder blade and extends in a curved arc under the arm to the front of the chest. The muscles are cut, and the ribs are spread with a retractor. The surgeon may also choose to open the chest through an incision down the breastbone, or sternum (sternotomy). Once the repair, replacement, or removal of the organ being oper-

ated on is complete, a chest tube is inserted between the ribs to drain the wound and re-expand the lung.

Video-assisted thoracic surgery (VATS) is a minimally invasive surgical technique that uses a thoracic endoscope (thoracoscope) to allow the surgeon to view the chest cavity. A lung is collapsed and 3–4 small incisions, or access ports, are made to facilitate insertion of the thoracoscope and the surgical instruments. During the procedure, the surgeon views the inside of the pleural space on a video monitor. The thoracoscope may be extracted and inserted through a different incision site as needed. When the surgical procedure is complete, the surgeon expands the lung and inserts a chest tube in one of the incision sites. The remaining incisions are sealed with adhesive.

The thoracic surgeon may also use a mediastinoscope or a bronchoscope to explore the thoracic cavity. **Mediastinoscopy** allows visualization of the mediastinum, the cavity located between the lungs. The bronchoscope enables the surgeon to view the larynx, trachea, and bronchi. These instruments may be used in a separate diagnostic procedure prior to thoracic surgery, or during the surgery itself.

Preparation

Except in the case of emergency procedures, candidates for general thoracic surgery should undergo a complete medical history and thorough **physical examination** prior to surgery. Particular attention is given to the respiratory system. The patient's **smoking** history will be questioned. If the patient is an active smoker, encouragement is always given for the patient to quit smoking prior to the surgery to facilitate recovery and reduce chances of complications.

Diagnostic tests used to evaluate the patient preoperatively may include, but are not limited to, X-rays, MRI, CT scans, **blood gas analysis**, pulmonary function tests, **electrocardiography**, endoscopy, pulmonary **angiography**, and **sputum culture**.

Candidates for thoracic surgery should be fully educated by their physician or surgeon on what their surgery will involve, the possible risks and complications, and requirements for postoperative care.

Patients are instructed not to eat 10 to 12 hours prior to a thoracic surgery procedure. A sedative may be provided to relax the patient prior to surgery. An intravenous line (IV) is inserted into the patient's arm or neck to administer fluids and/or medication.

Aftercare

After surgery, the patient is taken to the recovery room, where vital signs are monitored; depending on

KEY TERMS

Blood gas analysis—A blood test that measures the level of oxygen, carbon dioxide, and pH in arterial blood. A blood gas analysis can help a physician assess how well the lungs are functioning.

Electrocardiography—A cardiac test that measures the electrical activity of the heart.

Embolism—A blood clot, air bubble, or clot of foreign material that blocks the flow of blood in an artery. When blood supply to a tissue or organ is blocked by an embolism, infarction, or death of the tissue that the artery feeds, occurs. Without immediate and appropriate treatment, an embolism can be fatal.

Emphysema—A lung disease characterized by shortness of breath and a chronic cough. Emphysema is caused by the progressive stretching and rupture of alveoli, the air sacs in the lung that oxygenate the blood.

Endoscopy—The examination of organs and body cavities using a long, tubular optical instrument called an endoscope.

Intubation—Insertion of an endotracheal tube down the throat to facilitate airflow to the lung(s) during thoracic surgery.

Pericardium—The sac around the heart.

Pleural space—The space between the pleural membranes that surround the lungs and the chest cavity.

Pulmonary angiography—An x-ray study of the lungs, performed by insertion of a catheter into a vein, through the heart, and into the pulmonary artery. Pulmonary angiography is performed to evaluate blood circulation to the lungs. It is also considered the most accurate diagnostic test for detecting a pulmonary embolism.

Sputum culture—A laboratory analysis of the fluid produced from the lungs during coughing. A sputum culture can confirm the presence of pathogens in the respiratory system, and help to diagnose certain respiratory infections, including bronchitis, tuberculosis, and pneumonia.

the procedure performed, the breathing tube may be removed. The patient typically experiences moderate to severe **pain** following surgery. **Analgesics** or other pain medication are administered to keep the patient comfortable. Chest tubes are monitored closely for signs of fluid or air accumulation in the lungs that can lead to lung collapse. A urinary catheter will remain in the patient for 24 to 48 hours to drain urine from the bladder.

The hospital stay for thoracic surgery depends on the specific procedure performed. Patients who undergo a thoracotomy may be hospitalized a week or longer, while patients undergoing VATS typically have a shorter hospital stay of 2-3 days. During the recovery period, respiratory therapists and nurses work with the patient on deep breathing and coughing exercises to improve lung function.

Risks

Respiratory failure, hemorrhage, nerve injury, **heart attack**, **stroke**, **embolism**, and infection are all possible complications of general thoracic surgery. The chest tubes used for drainage after thoracic surgery may cause a build-up of fluid or the accumulation of air in the pleural space. Both of these conditions can lead to total

lung collapse. Other specific complications may occur, depending on the procedure performed.

Normal results

Normal results of thoracic surgery are dependent on the type of procedure performed and the clinical purpose of the surgery.

Resources

ORGANIZATIONS

American Thoracic Society. 1740 Broadway, New York, NY 10019. (212) 315-8700. <<http://www.thoracic.org>>.

Paula Anne Ford-Martin

Thoracoscopy

Definition

Thoracoscopy is the insertion of an endoscope, a narrow-diameter tube with a viewing mirror or camera attachment, through a very small incision (cut) in the chest wall.

Purpose

Thoracoscopy makes it possible for a physician to examine the lungs or other structures in the chest cavity, without making a large incision. It is an alternative to thoracotomy (opening the chest cavity with a large incision). Many surgical procedures, especially taking tissue samples (biopsies), can also be accomplished with thoracoscopy. The procedure is done to:

- assess lung **cancer**
- take a biopsy for study
- determine the cause of fluid in the chest cavity
- introduce medications or other treatments directly into the lungs
- treat accumulated fluid, pus (**empyema**), or blood in the space around the lungs

For many patients, thoracoscopy replaces thoracotomy. It avoids many of the complications of open chest surgery and reduces **pain**, hospital stay, and recovery time.

Precautions

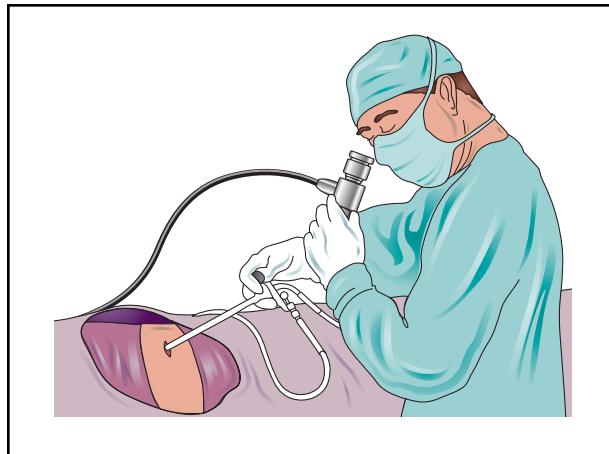
Because one lung is partially deflated during thoracoscopy, the procedure cannot be done on patients whose lung function is so poor that they do not receive enough oxygen with only one lung. Patients who have had previous surgery that involved the chest cavity, or who have bloodclotting problems, are not good candidates for this procedure.

Thoracoscopy gives physicians a good but limited view of the organs, such as lungs, in the chest cavity. Endoscope technology is being refined every day, as is what physicians can accomplish by inserting scopes and instruments through several small incisions instead of making one large cut.

Description

Thoracoscopy is most commonly performed in a hospital, and general anesthesia is used. Some of the procedures are moving toward outpatient services and local anesthesia. More specific names are sometimes applied to the procedure, depending on what the target site of the effort is. For example, if a physician intends to examine the lungs, the procedure is often called pleuroscopy. The procedure takes two to four hours.

The surgeon makes two or three small incisions in the chest wall, often between the ribs. By making the incisions between the ribs, the surgeon minimizes damage to muscle and nerves and the ribs themselves. A tube is inserted in the trachea and connected to a ventilator, which is a mechanical device that assists the patient with inhaling and exhaling.



Thoracoscopy is a procedure in which a physician can view the chest cavity and the lungs by inserting an endoscope through the chest wall. Thoracoscopy is less invasive than surgical lung biopsy. (Illustration by Electronic Illustrators Group.)

The most common reason for a thoracoscopy is to examine a lung that has a tumor or a metastatic growth of cancer. The lung to be examined is deflated to create a space between the chest wall and the lung. The patient breathes with the other lung with the assistance of the ventilator.

A specialized endoscope, or narrow-diameter tube, with a video camera or mirrored attachment, is inserted through the chest wall. Instruments for taking necessary tissue samples are inserted through other small incisions. After tissue samples are taken, the lung is reinflated. All incisions except one are closed. The remaining open incision is used to insert a drainage tube. The tissue samples are sent to a laboratory for evaluation.

Preparation

Prior to thoracoscopy, the patient will have several routine tests, such as blood, urine and **chest x ray**. Older patients must have an electrocardiogram (a trace record of the heart activity) because the anesthesia and the lung deflation put a big load on the heart muscle. The patient should not eat or drink from midnight the night before the thoracoscopy. The anesthesia used can cause vomiting, and, because anesthesia also causes the loss of the gag reflex, a person who vomits is in danger of moving food into the lungs, which can cause serious complications and **death**.

Aftercare

After the procedure, a chest tube will remain in one of the incisions for several days to drain fluid and release residual air from the chest cavity. Hospital stays range from two to five days. Medications for pain are given as

KEY TERMS

Endoscope—Instrument designed to allow direct visual inspection of body cavities, a sort of microscope in a long access tube.

Thoracotomy—Open chest surgery.

Trachea—Tube of cartilage that carries air into and out of the lungs.

needed. After returning home, patients should do only light lifting for several weeks.

Risks

The main risks of thoracoscopy are those associated with the administration of general anesthesia. Sometimes excessive bleeding, or hemorrhage, occurs, necessitating a thoracotomy to stop it. Another risk comes when the drainage tube is removed, and the patient is vulnerable to lung collapse (**pneumothorax**).

Resources

BOOKS

- Atkinson, Lucy Jo, and Nancymarie Fortunato. *Berry & Kohn's Operating Room Technique*. St. Louis: Mosby, 1996.
 Manncke, Klaus, and R. David Rosin. *Minimal Access Thoracic Surgery*. London: Chapman & Hall, 1998.
 "Thoracoscopy." In *Everything You Need to Know About Medical Treatments*. Springhouse, PA: Springhouse Corp., 1996.

PERIODICALS

- Dardes, N., E.P. Graziani, I. Fleishman, and M. Papale. "Medical Thoracoscopy in Management of Pleural Effusions." *Chest* 118, no. 4 (October 2000): 129s.
 Shawgo, T., T.M. Boley, and S. Hazelrigg. "The Utility of Thoracoscopic Lung Biopsy for Diagnosis and Treatment." *Chest* 118, no. 4 (October 2000): 114s.

Tish Davidson, A.M.

Thoracotomy see **Lung surgery; Thoracic surgery**

Threadworm see **Enterobiasis**

asitic roundworm (helminth). In untreated patients, the disease has a high rate of reinfection caused by worms already present in the body. This type of disease recurrence is called autoinfection. Because of autoinfection, threadworms can remain inside humans for as long as 45 years after the initial infestation.

Description

Threadworm infection, which is also called strongyloidiasis, occurs in most countries of the world but is natural to (endemic in) tropical and subtropical climates. Strongyloidiasis is less common than other parasitic infections but may affect as much as 25% of the population in some developing countries. In the United States, threadworm infection is most likely to be found among immigrants; returning travelers or military personnel; people who live in parts of Appalachia and the southeastern states; and persons in homes for the retarded and similar institutions.

Human beings are universally susceptible to threadworm infection, although adults and older children are at greater risk of infection than younger children. The disease does not confer immunity. In addition to humans, threadworms can infect dogs, cats, horses, pigs, rats, and monkeys.

Causes and symptoms

Threadworm infection is caused by *Strongyloides stercoralis*, a roundworm that lives in soil and can survive there for several generations. Mature threadworms may grow as long as 1–2 in (2.5–5 cm). The larvae have two stages in their life cycle: a rod-shaped (rhabdoid) first stage, which is not infective; and a threadlike (filariform) stage, in which the larvae can penetrate intact human skin and internal tissues.

The infection is most commonly transmitted when a person comes into contact—usually by walking barefoot—with soil containing *S. stercoralis* larvae in their filariform stage. The threadlike larvae penetrate the skin, enter the lymphatic system, and are carried by the blood to the lungs. Once in the lungs, the larvae burst out of the capillaries into the patient's main respiratory system. They migrate upwards—usually without symptoms—to the patient's throat, where they are swallowed and carried down into the digestive tract. The filariform larvae settle in the small intestine. They mature into adults that deposit eggs that hatch—usually in the intestines—into noninfectious rhabdoid larvae. The rhabdoid larvae then migrate into the patient's large intestine and are excreted in the feces. The time from initial penetration of the skin to excretion is 17–28 days. The rhabdoid larvae metamorphose into the infective filariform stage in the soil.

Threadworm infection

Definition

Threadworm infection is an intestinal disease, which occasionally spreads to the skin, caused by a type of par-

Threadworms are unique among human parasites in having both free-living and parasitic forms. In the free-living life cycle, some rhabdoid larvae develop into adult worms that live in contaminated soil and produce eggs that hatch into new rhabdoid larvae. The adult worms may live as long as five years.

The signs and symptoms of threadworm infection vary according to the stage of the disease as the larvae migrate throughout the body. Patients who suffer from autoinfection may have chronic or intermittent symptoms for years after they are first infected.

Skin

The filariform larvae usually enter the body through the skin of the feet. There may be swelling, **itching**, and **hives** at the point of entry that may be confused with insect bites. Patients with chronic threadworm infection may also develop an itchy rash on their buttocks, thighs, or abdomen.

Digestive tract

Although some patients may notice only mild **diarrhea** and cramps, others may have **fever**, nausea, vomiting, general weakness, and blood or mucus in their stools. The **pain** may mimic a stomach ulcer.

Throat and lungs

When the larvae migrate to the lungs and air passages, the patient may have symptoms ranging from a simple dry **cough** to fever, difficulty breathing, and coughing up blood or pus.

Hyperinfection syndrome

Hyperinfection syndrome is a potentially fatal set of complications resulting from the spread of filariform larvae to the lungs and other organ systems. It can include inflammation of the heart tissue, stomach ulcers, perforation of the intestines, blood **poisoning**, **meningitis**, **shock**, and eventual **death**. Hyperinfection syndrome is most likely to occur in patients with immune disorders or **malnutrition**, or in those taking anti-inflammatory corticosteroid (anti-inflammatory) medications. It has been reported in only a few **AIDS** patients.

Autoinfection

Threadworm autoinfection in humans follows two patterns. In internal autoinfection, some rhabdoid larvae in the lower bowel develop into filariform larvae that enter the bloodstream from the intestines and migrate to the lungs. In external autoinfection, the skin around the patient's anus is infected by larvae in the feces.

Diagnosis

The doctor is likely to consider a diagnosis of threadworm infection when a patient has the symptoms described earlier and a history of travel or military service in areas where the disease is endemic. A definite diagnosis is made by finding rhabdoid or filariform larvae in the patient's body fluids. The larvae may be found in fresh stool specimens or in mucus coughed up when the infection has reached the lungs. Because the larvae cannot be detected in the stools of 25% of infected patients, the string test is often performed to confirm the diagnosis. In this test, the patient swallows a weighted string which is withdrawn after four hours. The digestive juices absorbed by the string are then examined for the presence of threadworm larvae.

Doctors can also use blood tests and diagnostic imaging to support the diagnosis. Between 85% and 95% of patients with threadworm infections will have a measurable level of antibodies in their blood, even though these antibodies do not prevent the disease from spreading. In addition, patients with severe infections often have unusually high levels of white cells in their blood. X rays of the intestines or the chest often help in locating specific areas of inflamed or ulcerated tissue.

Treatment

Threadworm infections are treated with medications. The drugs most often given are ivermectin, thiabendazole (Mintezol), and albendazole. Ivermectin is generally preferred because it has fewer side effects than thiabendazole. These drugs, which are taken by mouth over a period of two to seven days, work by preventing the development of eggs and new larvae. Patients with severe infections should be given protein replacement, blood transfusions, and fluids to replace losses from nausea, vomiting, and diarrhea.

Patients who are taking **corticosteroids** should be carefully evaluated if they have symptoms of threadworm infection, because these medications encourage the development of hyperinfection syndrome.

Prognosis

The prognosis for complete recovery is good for most patients, except those with hyperinfection syndrome or severe protein loss.

Prevention

There is no effective immunization against threadworm infection. Prevention of the disease requires careful attention to personal and institutional hygiene in

KEY TERMS

Antibody—A protein molecule produced by the immune system that is specific to a disease agent, such as threadworm larvae. The severity of a patient's infection can be measured from the level of antibody in the blood.

Autoinfection—An infection caused by a disease agent that is already present in the body.

Corticosteroid—A class of drugs based on hormones formed in the adrenal gland, used to reduce inflammation. They increase the likelihood of hyperinfection syndrome in patients with threadworm infection.

Endemic—Natural to or characteristic of a particular place, population, or climate. Threadworm infections are endemic in the tropics.

Filariform—Threadlike in appearance, like the infectious stage of the threadworm larva.

Helminth—A type of parasitic worm. Threadworms belong to a subcategory of helminths called nematodes, or roundworms.

Hyperinfection syndrome—A condition of massive infection in which threadworm larvae multiply rapidly and spread throughout the body. It is usually associated with damage to the immune system, the use of steroid medications, or malnutrition.

Rhabdoid—Rod- or wand-shaped, like the first stage of the threadworm larva.

String test—A test performed to diagnose threadworm infection. The patient is asked to swallow a weighted string that absorbs stomach juices, which can be analyzed for the presence of threadworm larvae.

endemic areas, including handwashing after defecating and before handling food. Other precautions include wearing shoes when visiting countries with high rates of threadworm infection, and monitoring close contacts of patients for signs of infection.

Resources

BOOKS

Genta, Robert M. "Strongyloidiasis." In *Encyclopedia of Immunology*. Vol. 3. Ed. Ivan M. Roitt and Peter J. Delves. London, UK: Academic Press, 1992.

Goldsmith, Robert S. "Infectious Diseases: Protozoal & Helminthic." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

"Infectious Disease: Parasitic Infections." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

McCarthy, James S., and Thomas B. Nutman. "Parasitic Diseases of the Skin." In *Conn's Current Therapy*, 1996, ed. Robert E. Rakel. Philadelphia: W. B. Saunders Co., 1996.

Phillips, Elizabeth, and Jay S. Keystone. "Intestinal Parasites." In *Conn's Current Therapy*, 1996, ed. Robert E. Rakel. Philadelphia: W. B. Saunders Co., 1996.

Weinberg, Adriana, and Myron J. Levin. "Infections: Parasitic & Mycotic." In *Current Pediatric Diagnosis & Treatment*, ed. William W. Hay Jr., et al. Stamford: Appleton & Lange, 1997.

Rebecca J. Frey, PhD

Throat culture

Definition

A throat culture is a technique for identifying disease bacteria in material taken from the throat. Most throat cultures are done to rule out infections caused by beta-hemolytic streptococci, which cause **strep throat**. Hemolytic means that these streptococci destroy red blood cells.

Purpose

The primary purpose of a throat culture is identification of the specific organisms that cause strep throat. These organisms are Group A streptococci, specifically *Streptococcus pyogenes*. Since most sore throats are caused by viral infections rather than by *S. pyogenes*, a correct diagnosis is important to prevent unnecessary use of **antibiotics** and to begin treatment of strep infections as soon as possible. Group A **streptococcal infections** are potentially life-threatening, often involving other parts of the body in addition to the throat. Besides causing **sore throat** (pharyngitis), streptococci can also cause **scarlet fever**, **rheumatic fever**, kidney disease, or abscesses around the tonsils.

Throat cultures can also be used to identify other disease organisms that are present in the patient's throat; and to identify people who are carriers of the organisms that cause **meningitis** and **whooping cough**.

Besides their use in diagnosis, throat cultures are sometimes used to test antibiotics for their effectiveness in treating different infections.



This nurse is taking a throat culture from a patient for laboratory analysis. (Photograph by David Weinstein & Associates, Custom Medical Stock Photo. Reproduced by permission.)

Precautions

Throat cultures should be taken before the patient is given any antibiotic medications. In addition, the patient's immunization history should be checked to evaluate the possibility that diseases other than strep are causing the sore throat. The care provider should wash the hands carefully after taking the specimen to prevent the spread of any infectious organisms.

Description

A throat culture test should be done on anyone who has symptoms of a strep throat. These symptoms include a sore throat that may be accompanied by a **fever**, body aches, and loss of appetite. Age is a consideration, in that strep throat is more common in children than in adults. The tonsils and the back of the throat often appear red, swollen, and streaked with pus. These symptoms usually appear one to three days after being exposed to group A strep. Because strep is highly contagious, family members and close contacts of patients diagnosed with strep throat should also have throat cultures performed if they show signs of the disease.

The specimen for throat culture is obtained by wiping the patient's throat with a cotton swab. The patient is asked to tilt the head back and open the mouth wide. With the tongue depressed and the patient saying "ah," the care provider wipes the back of the throat and the tonsils with a sterile swab. The swab is applied to any

area that appears either very red or discharging pus. The swab is removed gently without touching the teeth, gums, or tongue. It is then placed in a sterile tube for immediate delivery to a laboratory. Obtaining the specimen takes less than 30 seconds. Laboratory results are usually available in two to three days. The swabbing procedure may cause gagging but is not painful. The doctor makes a note for the laboratory to indicate if any disease organisms other than strep are suspected, because some require special growth conditions in the laboratory.

S. pyogenes is cultured on a growth medium called blood agar. Agar is a gel that is made from the cell walls of red algae. Blood agar is made from agar gel and sheep's blood. When the throat swab reaches the laboratory, it is wiped across a blood agar plate. The plate is allowed to incubate for 24–48 hours to allow the growth of bacteria. If the organism is a Group A hemolytic streptococcus, the area immediately around the bacterial colony will be cleared of red blood cells. Hemolytic streptococci dissolve (lyse) red blood cells, leaving a clear zone surrounding the colony.

Alternative procedures

So-called instant strep tests are now available to help diagnose strep throat. They can be used in the doctor's office and take about 10–30 minutes to perform. Instant tests detect an antigen associated with the streptococcus. These tests are relatively new and not available at all clinics. Their reliability has improved since they were first introduced. If an instant throat test is negative, however, a standard throat culture can be performed to verify the results.

Preparation

The patient does not need to avoid food or fluids before the test. Recent gargling or treatment with antibiotics, however, will affect the culture results. The laboratory should be notified if the patient has been recently taking antibiotic medications.

Aftercare

No specific aftercare is needed.

Risks

There is a minor risk for the health professional of exposure to the patient's illness.

Normal results

Normal results would include finding organisms that grow in healthy throat tissues. These organisms include

KEY TERMS

Agar—A gel made from red algae that is used to culture certain disease agents in the laboratory.

Antibiotic—A drug given to stop the growth of bacteria. Antibiotics are ineffective against viruses.

Antigen—A substance that interacts with an antibody and causes an immune reaction.

Carrier—A person harboring an infectious disease who may be immune to it but who can give it to others.

Diphtheria—A serious disease caused by a bacterium, *Corynebacterium diphtheriae*.

Hemolytic—Able to dissolve red blood cells. The bacteria that cause strep throat are hemolytic organisms.

Streptococcus—A category (genus) of sphere-shaped bacteria that occur in pairs or chains.

Thrush—A disease occurring in the mouth or throat that is caused by a yeast, *Candida albicans*.

Whooping cough—An infectious disease of the respiratory tract caused by a bacterium, *Bordetella pertussis*.

non-hemolytic and alpha-hemolytic streptococci, some *Neisseria* species, staphylococci, **diphtheria** and hemophilus organisms, pneumococci, yeasts, and Gram-negative rods.

Abnormal results

In addition to *S. pyogenes*, other disease agents may be identified in the throat culture. Infectious agents that can be identified include *Candida albicans*, which can cause thrush; *Corynebacterium diphtheriae*, which can cause diphtheria; and *Bordetella pertussis*, which can cause whooping **cough**. In addition, the appearance of a normal organism in very high numbers may also be regarded as an abnormal result.

Resources

BOOKS

“Throat Culture.” In *Illustrated Guide to Diagnostic Tests*, ed. J. A. Lewis. Springhouse, PA: Springhouse Corp. 1994.

PERIODICALS

Perkins, A. “An Approach to Diagnosing the Acute Sore Throat.” *American Family Physician* 55 (Jan. 1997): 131-137.

ORGANIZATIONS

American Medical Association. 515 N. State St., Chicago, IL 60612. (312) 464-5000. <<http://www.ama-assn.org>>.

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Cindy L. A. Jones, PhD

Thromboangiitis obliterans see **Buerger's disease**

Thrombocyte count see **Platelet count**

Thrombocytopenia

Definition

Thrombocytopenia is an abnormal drop in the number of blood cells involved in forming blood clots. These cells are called platelets.

Description

Thrombocytopenia is a blood disease characterized by an abnormally low number of platelets in the bloodstream. The normal amount of platelets is usually between 150,000 and 450,000 cells per microliter of blood. A microliter is an amount equal to one one-millionth of a liter (a liter is almost equal to a quart). Platelet numbers are counted by having a blood sample collected and placing a measured amount of blood in a machine called a cell counter. When the platelet number drops below 150,000 cells per microliter of blood, this person is said to be thrombocytopenic.

Causes and symptoms

Abnormal reductions in the number of platelets are caused when abnormalities occur in any of the following three processes: decreased platelet production by the bone marrow; increased trapping of platelets by the spleen; or a more rapid than normal destruction of platelets. Persons with this condition easily bruise and can have episodes of excess bleeding (a hemorrhage).

Platelets come from megakaryocytes, which are produced in the material located within the center cavity of the bones (bone marrow). When abnormalities develop in the marrow, the marrow cells can lose their ability to produce platelets in correct amounts. The result is a lower than normal level of platelets in the blood. Drugs used in **cancer chemotherapy** can cause the marrow to mal-

function in this way, as can the presence of tumor cells in the marrow itself.

Normally, the spleen holds about one-third of the body's platelets as part of this organ's function to recycle aging or damaged red blood cells (the cells that carry oxygen in the blood). When liver disease or cancer of the spleen is present, the spleen can enlarge, resulting in a greater number of platelets staying in the organ. This condition results in abnormally low numbers of platelets in the blood.

Platelets can break down in unusually high amounts in persons with abnormalities in their blood vessel walls; with blood clots; or with man-made replacement heart valves. Devices placed inside blood vessels to keep them from closing (stents) due to weakened walls or fat build-up can also cause platelets to break down. In addition, infections and other changes in the immune system can speed up the removal of platelets from the circulation.

Diagnosis

Thrombocytopenia is diagnosed by having a blood sample taken and counting the platelets present in the sample. However, accurately determining the medical reason for this conditions is complex.

Once a low **platelet count** is verified, a careful evaluation of the function of the bone marrow and spleen are necessary. Improper functioning of either or both of these organs can cause thrombocytopenia. In addition, the causes for the abnormal spleen or marrow function must be investigated since different cancers, blood disorders, or liver disease can be the true cause for the drop in platelets found in the blood.

Treatment

If low platelet counts are caused by an enlarged spleen, removal of the spleen can help raise the platelet level, since the spleen is no longer there to capture the platelets. However, proper treatment for what causes the enlarged spleen is necessary as well.

Low platelet counts can indicate more serious conditions. If a dysfunctional immune system is found to be the cause for this condition, drugs like steroids or gamma globulin can be used to help maintain platelet levels in certain cases.

If low platelet levels are due to an abnormally low level of platelet production, transfusions of platelets can be given as well.

Prognosis

Thrombocytopenia can result in fatal bleeding, but it also can indicate various other, more serious, cancers and

KEY TERMS

Gamma globulin—One of a group of proteins found in the blood that is involved in helping the body fight infections.

Stent—A man-made surgical device, usually tube-shaped, that is placed into a blood vessel to keep it from closing.

Transfusion—The transfer of blood from one person to another. Transfusions can be direct, in which blood is transferred from the donor to the recipient; or indirect, in which the blood is taken from the donor, stored in a container, and then given to the recipient.

disorders that affect the blood cells. This condition requires thorough medical evaluation.

Prevention

There is no known way to prevent thrombocytopenia.

Resources

BOOKS

Handin, Robert I. "Disorders of the Platelet and Vessel Wall." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

PERIODICALS

Sadovsky, Richard. "Management of Heparin-Induced Thrombocytopenia." *American Family Physician* 55 (1 May 1997): 2310.

Winkelstein, Alan, and Joseph E. Kiss. "Immunohematologic Disorders." *Journal of the American Medical Association* 278 (10 Dec. 1997): 1982.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

Dominic De Bellis, PhD

Thrombocytosis

Definition

Thrombocytosis is a blood disorder in which the body produces a surplus of platelets (thrombocytes).

Description

Thrombocytosis is an abnormally increased number of platelets in the blood. Platelets are blood cells that stick together, helping blood to clot. Thrombocytosis is a condition that may have many causes.

Thrombocytosis is classified as one of two types. Secondary thrombocytosis can be traced to another cause, such as inflammation, severe bleeding, iron deficiency, or some cancers. Primary thrombocytosis (or essential thrombocythemia) is a single disease entity, with unique clinical characteristics.

Causes and symptoms

The cause of essential thrombocytosis is unknown.

Secondary thrombocytosis may develop as a result of:

- acute hemorrhage or infection
- anemia
- arthritis and other chronic inflammations
- cancer
- exercise
- iron deficiency
- medication
- osteoporosis
- removal of the spleen (**splenectomy**)
- polycythemia vera (a disorder affecting other red blood cells, as well as platelets)
- stress
- surgery

Symptoms

Two of every three patients who have thrombocytosis do not have any symptoms of the disease at the time of diagnosis. Younger patients may remain symptom-free for years.

Enlargement of the spleen is detected in 60% of patients with thrombocytosis. The liver may also be enlarged. As many as half of all patients experience bleeding from the skin, gums, or nose; and 20–50% have some blockage of veins or arteries.

Other symptoms of thrombocytosis include:

- bloody stools
- bruising
- dizziness
- headache
- hemorrhage

- prolonged bleeding after having surgery or after having a tooth pulled
- redness or tingling of the hands and feet
- weakness. In rare instances, the lymph nodes become enlarged

The highest platelet counts usually produce the most severe symptoms. Younger patients (especially women) may not have symptoms, even though their platelet counts are very high.

Complications

Complications of thrombocytosis include **stroke**, **heart attack**, and formation of blood clots in the arms and legs.

A doctor should be notified whenever bleeding is unexplained or prolonged or the patient develops:

- chest or leg **pain**
- confusion
- numbness
- weakness

Diagnosis

The patient's symptoms suggest the presence of thrombocytosis. Blood tests confirm the diagnosis.

Bone marrow aspiration (removal of a tissue sample for microscopic examination) may also be performed.

Treatment

The key to treating secondary thrombocytosis is treating the underlying condition.

Any patient who has thrombocytosis should be encouraged not to smoke.

In young people who have no symptoms, this condition can remain stable for many years. These patients should be monitored by a physician, but may not require treatment.

Treatment for patients who do have symptoms focuses on controlling bleeding, preventing the formation of blood clots, and lowering platelet levels. Treatment for secondary thrombocytosis involves treating the condition or disease responsible for excess platelet production.

In 1997, the United States Food and Drug Administration (FDA) approved the use of anagrelide HCl (Agrylin) to reduce elevated platelet counts and decrease the risk of clot formation. Some patients have benefited from the use of hydroxyurea, an anti-cancer drug.

Low doses of **aspirin** may prevent clotting, but can cause serious hemorrhages.

If drug therapy does not bring platelet counts down to an acceptable level as rapidly as necessary, plateletpheresis may be performed. Usually combined with drug therapy and used primarily in medical emergencies, this procedure consists of:

- withdrawing blood from the patient's body
- removing platelets from the blood
- returning the platelet-depleted blood to the patient

Prognosis

Many patients with thrombocytosis remain free of complications for long periods. However, some patients may die as a result of blood clots or uncontrolled bleeding.

Prevention

There is no known way to prevent thrombocytosis.

Resources

BOOKS

Berkow, Robert, ed. *The Merck Manual of Medical Information: Home Edition*. Whitehouse Station, NJ: Merck & Co., Inc., 1997.

Harrison's Principles of Internal Medicine. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

OTHER

"FDA Approves Marketing of Agrylin for Thrombocythemia." 31 May 1998 <<http://www.plsgroup.com.dg/2114a.htm>>. "Primary Thrombocythemia." *The Meck Page*. 3 June 1998 <<http://www.merck.com>>. "Primary Thrombocythemia." *HealthAnswers.com* 31 May 1998 <<http://www.healthanswers.com>>.

Maureen Haggerty

Thromboembolism see **Embolism**

Thrombolytic therapy

Definition

Thrombolytic therapy is the use of drugs that dissolve blood clots.

Purpose

When a blood clot forms in a blood vessel, it may cut off or severely reduce blood flow to parts of the body

that are served by that blood vessel. This can cause serious damage to those parts of the body. If the clot forms in an artery that supplies blood to the heart, for example, it can cause a **heart attack**. A clot that cuts off blood to the brain can cause a **stroke**. Thrombolytic therapy is used to dissolve blood clots that could cause serious, and possibly life-threatening, damage if they are not removed. Research suggests that when used to treat stroke, thrombolytic therapy can prevent or reverse **paralysis** and other problems that otherwise might result.

Thrombolytic therapy also is used to dissolve blood clots that form in tubes put into people's bodies for medical treatments, such as dialysis or **chemotherapy**.

Description

Thrombolytic therapy uses drugs called thrombolytic agents, such as alteplase (Activase), anistreplase (Eminase), streptokinase (Streptase, Kabikinase), urokinase (Abbokinase), and tissue plasminogen activator (TPA) to dissolve clots. These drugs are given as injections, only under a physician's supervision.

Recommended dosage

The physician supervising thrombolytic therapy decides on the proper dose for each patient. He or she will take into account the type of drug, the purpose for which it is being used, and in some cases, the patient's weight.

Precautions

For thrombolytic therapy to be effective in treating stroke or heart attack, prompt medical attention is very important. The drugs must be given within a few hours of the beginning of a stroke or heart attack. However, this treatment is not right for every patient who has a heart attack or a stroke. Only a qualified medical professional can decide whether a thrombolytic agent should be used. To increase the chance of survival and reduce the risk of serious, permanent damage, anyone who has signs of a heart attack or stroke should get immediate medical help.

Thrombolytic therapy may cause bleeding. Usually this is not serious, but severe bleeding does occur in some people. This is especially likely in older people. To lower the risk of serious bleeding, people who are given this drug should move around as little as possible and should not try to get up on their own unless told to do so by a health care professional. Following all the instructions of the health care providers in charge is very important.

Thrombolytic therapy may be more likely to cause serious bleeding in people who have certain medical conditions or have recently had certain medical procedures. Before being given a thrombolytic agent, anyone with

any of these problems or conditions should tell the physician in charge about it:

- blood disease or current or past bleeding problems in any part of the body
- heart or blood vessel disease
- stroke (recent or in the past)
- high blood pressure
- brain tumor or other brain disease
- stomach ulcer or colitis
- severe liver disease
- active **tuberculosis**
- recent falls, injuries, or blows to the body or head
- recent injections into a blood vessel
- recent surgery, including dental surgery
- tubes recently placed in the body for any reason
- recent delivery of a baby

In addition, anyone who has had a recent streptococcal (strep) infection should tell the physician in charge. Some thrombolytic agents may not work properly in people who have just had a strep infection, so the physician may want to use a different drug.

People who take certain medicines may be at greater risk for severe bleeding when they are given a thrombolytic agent.

Women who are pregnant should tell the physician in charge before being given a thrombolytic agent. There is a slight chance that a woman who is given thrombolytic therapy during the first spell months of **pregnancy** will have a **miscarriage**. However, streptokinase and urokinase have both been used without problems in pregnant women.

After being treated with thrombolytic therapy, women who are breastfeeding should check with their physicians before starting to breastfeed again.

Side effects

Anyone who has **fever** or who notices bleeding or oozing from their gums, from cuts, or from the site where the thrombolytic agent was injected should immediately tell their health care provider.

People who are given thrombolytic therapy should also be alert to the signs of bleeding inside the body and should check with a physician immediately if any of the following symptoms occur:

- blood in the urine
- blood or black, tarry stools
- constipation

KEY TERMS

Arteries—Blood vessels that carry blood away from the heart to the cells, tissues, and organs of the body.

Blood clot—A hard mass that forms when blood gels.

Chemotherapy—Treatment of an illness with chemical agents. The term is usually used to describe the treatment of cancer with drugs.

Dialysis—A process used in people whose kidneys are not working well. By way of a filtering machine, dialysis separates waste and other useless materials from the blood—a job the kidneys usually do.

Paralysis—Loss of the ability to move one or more parts of the body.

Stroke—A serious medical event in which blood flow to the brain is stopped. This may be because of a blood clot in an artery or because an artery has burst. Strokes may cause paralysis and changes in speech, memory, and behavior.

- coughing up blood
- vomiting blood or material that looks like coffee grounds
- nosebleeds
- unexpected or unusually heavy vaginal bleeding
- dizziness
- sudden, severe, or constant headaches
- **pain** or swelling in the abdomen or stomach
- back pain or backache
- severe or constant muscle pain or stiffness
- stiff, swollen, or painful joints

Other side effects of thrombolytic agents are possible. Anyone who has unusual symptoms during or after thrombolytic therapy should tell a health care professional.

Interactions

People who take certain medicines may be at greater risk for severe bleeding when they receive a thrombolytic agent. Anyone who is given a thrombolytic agent should tell the physician in charge about all other prescription or nonprescription (over-the-counter) medicines he or she is

taking. Among the medicines that may increase the chance of bleeding are:

- aspirin and other medicines for pain and inflammation
- blood thinners (anticoagulants)
- antiseizure medicines, such as Depakote (divalproex) and Depakene (valproic acid)
- cephalosporins, such as cefamandole (Mandol), cefoperazone (Cefobid), and Cefotetan (Cefotan)

Also, anyone who has been treated with anistreplase or streptokinase within the past year should tell the physician in charge. These drugs may not work properly if they are given again, so the physician may want to use a different thrombolytic agent.

Nancy Ross-Flanigan

Thrombophlebitis

Definition

Thrombophlebitis is the inflammation of a vein with blood clot formation inside the vein at the site of inflammation. Thrombophlebitis is also known as phlebitis, phlebothrombosis, and venous thrombosis.

Description

There are two parts to thrombophlebitis, inflammation of a vein and blood clot formation. If the inflammation component is minor, the disease is usually called venous or phlebothrombosis. Thrombophlebitis can occur in both deep veins and superficial veins, but most often occurs in the superficial veins of the extremities (legs and arms). Most cases occur in the legs. When thrombophlebitis occurs in a superficial vein, one that is near the surface of the skin and is visible to the eye, the disease is called superficial thrombophlebitis. Any form of injury to a blood vessel can result in thrombophlebitis. In the case of superficial thrombophlebitis, the blood clot usually attaches firmly to the wall of the affected blood vein. Since superficial blood veins do not have muscles that massage the veins, blood clots in superficial veins tend to remain where they form and seldom break loose. When thrombophlebitis occurs in a deep vein, a vein that runs deep within muscle tissue, it is called deep venous thrombosis. Deep venous thrombosis presents the threat of producing blood clots that will break loose to form emboli. These can lodge in other tissues where they can block the blood supply, typically in the lungs. This results in tissue damage and can sometimes be serious or fatal; for example, **pulmonary embolism**.

Causes and symptoms

The main symptoms are tenderness and **pain** in the area of the affected vein. Redness and/or swelling may also be seen. In the case of deep venous thrombosis, there is more swelling than is caused by superficial thrombophlebitis, and the patient may experience muscle stiffness in the affected area. There are many causes of thrombophlebitis. The main causes can be grouped into three categories; injury to blood veins, increased blood clotting, and blood stasis. When blood veins are damaged, collagen in the blood vein wall is exposed. Platelets respond to collagen by initiating the clotting process. Damage to a vein can occur as a consequence of indwelling catheters, trauma, infection, **Buerger's disease**, or the injection of irritating substances. Increased tendency of the blood to clot can be caused by malignant tumors, genetic disorders, and **oral contraceptives**. Stasis, in which the blood clots due to decreased blood flow in an area, can happen following surgery, as a consequence of **varicose veins**, as a complication of postpartum states, and following prolonged bed rest. In the case of prolonged bed rest, blood clots form because of inactivity, which allows blood to move sluggishly and stagnate (collect) in blood veins. This can lead to blood clots. These clots (also called emboli) are sometimes released when the patient stands up and resumes activity. This can present a problem if the emboli lodge in vital organs. In the case of postpartum patients, a **fever** developing four to 10 days after delivery may indicate thrombophlebitis.

Diagnosis

In superficial thrombophlebitis, the location of the clot can sometimes be seen by the unaided eye. Blood clots are hard and can usually be detected by a physician using palpation (massage). Deep venous thrombosis requires specialized diagnostic instruments to detect the blood clot. Among the instruments a physician may use are ultrasound and x ray, coupled with dye injection (venogram).

Treatment

Superficial thrombophlebitis usually resolves without treatment. If treatment of superficial thrombophlebitis is given, it is usually limited to the application of heat or anti-inflammatory drugs, like **aspirin** or ibuprofen, which also help to relieve the pain. It can take from several days to several weeks for the clot to resolve and the symptoms to completely disappear. Rarely, anti-coagulant drugs may be administered. Deep venous thrombosis is a serious condition and is treated with anti-coagulant drugs and by keeping the affected limb elevated. The primary objective in treating deep venous throm-

bosis is prevention of a pulmonary **embolism**. The patient usually is hospitalized during initial treatment. The prescribed anticoagulant drugs limit the ability of blood clots to grow and new clots to form. Sometimes, a drug that dissolves blood clots is administered. These drugs must be used with caution because, as the clot dissolves, it may release from the site where it formed and become an embolus. Surgery may be used if the affected vein is likely to present a long term threat of producing blood clots that will release emboli. When superficial thrombophlebitis occurs in the groin, where the superficial veins join the deep veins, the threat of emboli is present. In this case, blood clots formed in the superficial veins can extend into the much larger deep vein where they break off and are released into the blood stream. The affected veins are either removed or tied off to prevent the release of the blood clots. Tying off superficial blood veins is an outpatient procedure that can be performed with local anesthesia. The patient is capable of immediately resuming normal activities.

Prognosis

Superficial thrombophlebitis seldom progresses to a serious medical complication, although non-lethal embolisms may be produced. Deep venous thrombosis may lead to embolism, especially pulmonary embolism. This is a serious consequence of deep venous thrombosis, and is sometimes fatal.

Resources

BOOKS

- Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill, 1998.
 Berkow, Robert, ed. *Merck Manual of Medical Information*. Whitehouse Station, NJ: Merck Research Laboratories, 1997.
 Larsen, D. E., ed. *Mayo Clinic Family Health Book*. New York: William Morrow and Co., Inc., 1996.

John T. Lohr, PhD

Thrush see **Candidiasis**

Thymol see **Antiseptics**

Thymoma

Definition

Thymomas are the most common tumor of the thymus.

KEY TERMS

Embolii, embolus—Embolii is the plural form of embolus. Embolus is any mass of air, blood clot, or foreign body that travels through the blood stream and is capable of lodging in smaller blood vessels where they obstruct the blood flow to that vessel.

Embolism—The obstruction of a blood vessel by a blot clot.

Phlebitis—Inflammation of a vein.

Thrombus—A blood clot that forms within a blood vessel or the heart.

Description

The thymus is located in the upper chest just below the neck. It is a small organ that produces certain types of white blood cells before birth and during childhood. These white blood cells are called lymphocytes and are an important part of the body's immune system. Once released from the thymus, lymphocytes travel to lymph nodes where they help to fight infections. The thymus gland becomes smaller in adulthood and is gradually taken over by fat tissue.

Although rare, thymomas are the most common type of thymic **cancer**. They arise from thymic epithelial cells, which make up the covering of the thymus. Thymomas frequently contain lymphocytes, which are noncancerous. Thymomas are classified as either noninvasive (previously called "benign") or invasive (previously called "malignant"). Noninvasive thymomas are those in which the tumor is encapsulated and easy to remove. Invasive thymomas have spread to nearby structures (such as the lungs) and are difficult to remove. Approximately 30% to 40% of thymomas are of the invasive type.

Thymoma affects men and women equally. It is usually diagnosed between the ages of 40 and 60 years. Thymomas are uncommon in children.

Causes and symptoms

The cause of thymoma is unknown. Cancer is caused when the normal mechanisms that control cell growth become disturbed, causing the cells to continually grow without stopping. This is caused by damage to the DNA in the cell.

Approximately 40% of the patients diagnosed with thymoma have no symptoms. The symptoms in the

remaining 60% of patients are caused by pressure from the enlarged thymus on the windpipe (trachea) or blood vessels, or by paraneoplastic syndromes. Paraneoplastic syndromes are collections of symptoms in cancer patients that cannot be explained by the tumor. Seventy-one percent of thymomas are associated with paraneoplastic syndromes. The most common syndromes related to thymoma are pure red cell aplasia (having abnormally low levels of red blood cells), **myasthenia gravis** (a muscular disorder), and hypogammaglobulinemia (having abnormally low levels of antibodies). These conditions are autoimmune diseases—those in which the body mounts an attack against certain normal cells of the body.

Symptoms of thymoma may include:

- **shortness of breath**

- swelling of the face

- coughing

- chest pain

- muscle weakness (especially in the eyes, neck, and chest, causing problems with vision, swallowing, and breathing)

- weakness

- dizziness

- shortness of breath

- **fatigue**

Diagnosis

The physician will conduct a complete physical exam. He or she may be able to feel a fullness in the lower neck region. Routine blood tests may be performed. Imaging studies are necessary because the symptoms of thymoma can be caused by many other diseases. Thymomas can be identified by **chest x ray**, **magnetic resonance imaging**, and computed tomography.

A biopsy may be performed, in which a small sample of the tumor is removed and examined under the microscope. However, because of the risk of “seeding” cancerous cells, biopsies are not routinely performed. There are a few different methods to biopsy a thymoma. For a **mediastinoscopy**, a wand-like lighted camera (endoscope) and special instruments are passed through a small cut in the lower neck. The surgeon can see the tumor on a monitor and can cut off small samples for microscopic analysis. Mediastinoscopy is performed under general anesthesia. Alternatively, a needle biopsy will be taken in which a long needle is passed through the skin and into the tumor. Fine needle biopsy uses a thin needle and larger-core needle biopsy uses a wider

needle. Needle biopsies may be performed in conjunction with CT imaging.

Patients who are having difficulty breathing may have a **bronchoscopy** performed to examine the wind pipe. An endoscope, in this case a bronchoscope, is inserted through the mouth and into the windpipe. The physician will look for tumors and may perform biopsies.

Treatment

Clinical staging

There is more than one type of staging system for thymoma; but the Masaoka system, a surgical staging system developed in 1981, is used most often. Thymoma is categorized into four stages (I, II, III, and IV), which may be further subdivided (A and B) based on the spread of cancerous tissue. The Masaoka staging system is as follows:

- Stage I. The thymoma lies completely within the thymus.
- Stage II. The thymoma has spread out of the thymus and invaded the outer layer of the lung (pleura) or nearby fatty tissue.
- Stage III. The thymoma has spread to other neighboring tissues of the upper chest, including the outer layer of the heart (pericardium), the lungs, or the heart’s main blood vessels.
- Stage IVA. The thymoma has spread throughout the pericardium and/or the pleura.
- Stage IVB. The thymoma has spread to organs in other parts of the body.

In 1999, the World Health Organization (WHO) adopted a new classification system for thymic tumors. This system is a histologic classification, which means that it is based on the microscopic features of the cells that make up the tumor. The WHO classification system ranks thymomas into types A, AB, B1, B2, B3, and C, by increasing severity.

The treatment for thymoma depends on the stage of cancer and the patients overall health. Because thymomas are so rare, there are no defined treatment plans. Treatment options include surgery, **radiation therapy**, and/or **chemotherapy**. Surgical removal of the tumor is the preferred treatment. Surgery is often the only treatment required for stage I tumors. Treatment of thymoma often relieves the symptoms caused by paraneoplastic syndromes.

A treatment that is intended to aid the primary treatment is called adjuvant therapy. For instance, chemother-

apy may be used along with surgery to treat thymoma. Stages II, III, and IV thymomas are often treated with surgery and some form of adjuvant therapy.

Surgery

Thymoma may be treated by surgically removing (resecting) the tumor and some of the nearby healthy tissue. Removal of the entire thymus gland is called a thymectomy. Surgery on the thymus is usually performed through the chest wall by splitting open the breast bone (sternum), a procedure called a median sternotomy. When complete removal of the tumor is impossible, the surgeon will remove as much of the tumor as possible (debulking surgery, subtotal resection). In these cases, If the tumor has spread, surgery may include removal of such other tissues as the pleura, pericardium, blood vessels of the heart, lung, and nerves.

Radiation therapy

Radiation therapy uses high-energy radiation from x rays and gamma rays to kill the cancer cells. Radiation given from a machine that is outside the body is called external radiation therapy. Radiation therapy is often used as adjuvant therapy following surgery to reduce the chance of cancer recurrence. Radiation may be used to kill cancer cells in cases in which the tumor was only partially removed. It may be used before surgery to shrink a large tumor. Radiation therapy is not very effective when used alone, although it may be used alone when the patient is too sick to withstand surgery.

The skin in the treated area may become red and dry and may take as long as a year to return to normal. Radiation to the chest may damage the lung, causing shortness of breath and other breathing problems. Also, the tube that goes between the mouth and stomach (esophagus) may be irritated by radiation, causing swallowing difficulties. Fatigue, upset stomach, **diarrhea**, and nausea are also common complaints of patients having radiation therapy. Most side effects go away about two to three weeks after radiation therapy has ended.

Chemotherapy

Chemotherapy uses **anticancer drugs** to kill the cancer cells. The drugs are given by mouth (orally) or intravenously. They enter the bloodstream and can travel to all parts of the body. Chemotherapy may be given before surgery to shrink a tumor, which is called neoadjuvant therapy. Thymoma cells are very sensitive to anticancer drugs, especially cisplatin, doxorubicin, and ifosfamide. Generally, a combination of drugs is given because it is more effective than a single drug in

treating cancer. **Corticosteroids** are also used to treat thymoma.

The side effects of chemotherapy are significant; and include stomach upset, vomiting, appetite loss, hair loss (**alopecia**), mouth sores, and fatigue. Women may experience vaginal sores, menstrual cycle changes, and **premature menopause**. There is also an increased chance of infections.

Alternative treatment

Although alternative and complementary therapies are used by many cancer patients, very few controlled studies on the effectiveness of such therapies exist. Mind-body techniques such as prayer, **biofeedback**, visualization, **meditation**, and **yoga**, have not shown any effect in reducing cancer; but they can reduce **stress** and lessen some of the side effects of cancer treatments. Gerson, macrobiotic, orthomolecular, and Cancell therapies are ineffective treatments for cancer.

Clinical studies of hydrazine sulfate found that it had no effect on cancer and even worsened the health and well-being of the study subjects. One clinical study of the drug amygdalin (Laetrile) found that it had no effect on cancer. Laetrile can be toxic and has caused deaths. Shark cartilage has been studied as a cancer treatment and is presently being studied by the FDA in clinical studies. Although the results are mixed, clinical studies suggest that melatonin may increase the survival time and quality of life for cancer patients.

Selenium, in safe doses, may delay the progression of cancer. Laboratory and animal studies suggest that curcumin, the active ingredient of turmeric, has anti-cancer activity. Maitake mushrooms may boost the immune system, according to laboratory and animal studies. The results of laboratory studies suggest that mistletoe has anticancer properties; however, clinical studies have not been conducted in the United States yet.

Prognosis

The five-year survival rates for thymomas are 96% for stage I, 86% for stage II, 69% for stage III, and 50% for stage IV. Thorough (radical) surgery is associated with a longer survival rate. Almost 15% of thymoma patients develop a second cancer.

Thymomas rarely spread (metastasize) outside of the chest cavity. Metastasis is usually limited to the pleura. Invasive thymomas are prone to recurrence, even 10 to 15 years following surgery. The recurrence rates are drastically reduced and the five-year survival rates are drastically increased in patients who receive adjuvant radiation therapy.

KEY TERMS

Adjuvant therapy—A treatment that is intended to aid the primary treatment. Adjuvant treatments for thymic cancer are radiation therapy and chemotherapy.

Invasive—A descriptive term for thymoma that has spread beyond the outer wall of the thymus.

Lymphocyte—A type of white blood cell that is found in the thymus.

Neoadjuvant therapy—Radiation therapy or chemotherapy used to shrink a tumor before surgical removal of the tumor.

Paraneoplastic syndrome—A set of symptoms that is associated with cancer but is not directly caused by the cancer.

Pleura—The outer covering of the lungs.

Prevention

Because there are no known risk factors for the development of thymoma, there are no preventive measures. However, there may be an association between thymic cancer and exposure of the chest to radiation.

Resources

BOOKS

American Cancer Society's Guide to Complementary and Alternative Cancer Methods, ed. Bruss, Katherine, Salter, Christina, and Esmeralda Galan. Atlanta: American Cancer Society, 2000.

Cameron, Robert, Loehrer, Patrick, and Charles Thomas.

"Neoplasms of the Mediastinum." In *Cancer: Principles & Practice of Oncology*, ed. DeVita, Vincent, Hellman, Samuel, and Steven Rosenberg. Philadelphia: Lippincott Williams & Wilkins, 2001, pp.1019- 36.

PERIODICALS

Giaccone, Giuseppe. "Treatment of Thymoma and Thymic Carcinoma." *Annals of Oncology* 11, Sup. 3 (2000): 245-6.

Muller-Hermelink, H. and A. Marx. "Thymoma." *Current Opinion in Oncology* 12 (September 2000): 426-33.

Thomas, Charles, Wright, Cameron, and Patrick Loehrer.

"Thymoma: State of the Art." *Journal of Clinical Oncology* 17 (July 1999): 2280-89.

ORGANIZATIONS

American Cancer Society. 1599 Clifton Road NE, Atlanta, GA 30329. (800) ACS-2345. <<http://www.cancer.org>>.

Cancer Research Institute, National Headquarters. 681 Fifth Ave., New York, NY 10022. (800) 992-2623. <<http://www.cancerresearch.org>>.

National Institutes of Health. National Cancer Institute. 9000 Rockville Pike, Bethesda, MD 20982. Cancer Information Service: (800) 4-CANCER. <<http://cancernet.nci.nih.gov>>.

Belinda Rowland, Ph.D.

Thymus tumor see **Thymoma**

Thyroid biopsy

Definition

The thyroid biopsy is a procedure in which a sample of thyroid tissue is withdrawn for laboratory examination. The sample can be withdrawn through a needle or a surgical incision may be made to obtain a piece of thyroid tissue.

Purpose

The test is generally performed when a lump or a nodule is detected in the thyroid. The test may also be ordered if the thyroid gland is enlarged and the cause is not apparent. The biopsy is usually a test for **thyroid cancer**.

Precautions

A patient with a bleeding disorder should not have a biopsy unless the bleeding problem can be corrected by a **transfusion** of the cells that cause blood to clot (platelets).

Description

The thyroid is a butterfly-shaped gland located at the base of the neck. It produces thyroxine, a hormone that plays a very crucial role in regulating the metabolism of the body and controlling several vital functions, such as the heart beat, blood pressure, and body temperature. The thyroid also regulates childhood growth and development.

A thyroid biopsy is usually ordered when a painless lump or a nodule is detected, either by the patient or by a doctor during a routine **physical examination**. A biopsy is the only test that can accurately determine whether the lump is non-cancerous (benign) or cancerous (malignant). The biopsy can be performed in several ways.

The "fine needle aspiration" (FNA) can be done in the doctor's office. An anesthetic is not usually given.

The patient will be asked to lie on his or her back. A pillow will be placed under the shoulders and the neck will be extended. The biopsy site will be cleansed with a sterile antiseptic solution. A thin needle will be inserted into the thyroid, and a sample of thyroid cells and some fluid will be collected. The needle will be quickly withdrawn. Pressure will be applied at the biopsy site to stop the bleeding and a bandage may be used to cover the area. The test takes three to five minutes.

For “large needle biopsy,” a mild sedative may be given an hour before the procedure, to relax the patient. The patient will be asked to lie on his or her back, with the head tipped back and the neck extended. The biopsy site will be thoroughly cleansed and the physician will inject a local anesthetic. A small incision (about 1 inch) will be made in the skin. The biopsy needle will be inserted through the incision into the thyroid. A sample of tissue will be removed and the needle withdrawn. Pressure is applied at the biopsy site to stem the bleeding and a bandage applied. This test takes five to ten minutes.

The “open incisional biopsy” is done in an operating room by a surgeon. The patient will be given a general anesthetic. A sedative will be given an hour before the procedure to relax the patient. An intravenous line will be placed in the arm for infusion of fluids or drugs. An endotracheal tube will be inserted through the mouth into the lungs for administering anesthetic gases. After the patient is anesthetized, a small incision is made in the neck. Either the whole thyroid or a part of it is removed. If only a portion is being removed, the surgeon may send a small piece of remaining tissue to the laboratory for immediate testing while the patient is still on the operating table. If the pathologist’s report comes back stating that **cancer** is present in the remaining tissue, the entire thyroid is removed. The incision is closed with stitches. The whole procedure may take about an hour.

Preparation

The doctor should be informed of any **allergies** to medications and every medication the patient is taking. If the patient is pregnant, the doctor should be told.

The patient will be asked to sign the necessary consent forms. If a needle biopsy is done, no special preparation is needed. If a large needle biopsy is being done, the doctor may order some tests to determine the clotting ability of the blood. If an open incisional biopsy is being done, a general anesthetic is required and the patient will be asked to refrain from eating or drinking anything 8-12 hours before the test.

Aftercare

The needle used in fine needle aspiration is so thin, the whole procedure feels like a quick injection. There is no **pain** or tenderness at the site after the test. In large needle biopsy, a stinging needle prick may be felt when the local anesthetic is injected. The site may be sore for a few hours and tender for a day or two after the test.

In the open incisional biopsy, the patient will feel nothing during the procedure, because of the effects of the anesthetic and the sedative. However, the anesthetic may cause the patient to feel drowsy for several hours after the procedure. The anesthetic may also cause the patient to experience some **fatigue**, and general aches and pains for a day or two after the procedure. The endotracheal tube may make the throat feel mildly sore. If there is swelling at the biopsy site or if the patient develops a **fever**, the doctor should be notified immediately.

Risks

No risks are associated with fine needle aspiration. Large needle biopsy may cause bleeding into the thyroid gland. There is a small risk that the anesthetic used in open surgical biopsy may cause a life-threatening reaction.

Normal results

The normal appearance and architecture of the thyroid cells indicate that no cancer cells are present in the thyroid tissue.

Abnormal results

Any abnormalities of the thyroid tissue cells may indicate cancer, benign tumors, or some other thyroid disease. If cancer is suspected, the pathologist may do some more testing to identify the extent of the cancer so that it can be treated appropriately.

Resources

BOOKS

The Patient’s Guide to Medical Tests. Ed. Barry L. Zaret, et al. Boston: Houghton Mifflin, 1997.
Sobel, David S., and Tom Ferguson. The People’s Book of Medical Tests. New York: Summit Books, 1985.

ORGANIZATIONS

American Thyroid Association, Inc. Montefiore Medical Center, 111 East 210th St., Bronx, NY 10467. <<http://thyroid.org>>.
 Thyroid Foundation of America, Inc. Ruth Sleeper Hall, RSL 350, 40 Parkman St., Boston, MA 02114-2698. (800) 832-8321.

Lata Cherath, PhD

KEY TERMS

Biopsy—The surgical removal and microscopic examination of living tissue for diagnostic purposes.

Endotracheal tube—A hollow tube that is inserted into the windpipe (trachea), leading to the lungs.

Pathologist—A doctor who specializes in the diagnosis of disease by studying cells and tissues under a microscope.

Thyroid cancer

Definition

Thyroid **cancer** is a disease in which the cells of the thyroid gland become abnormal, grow uncontrollably, and form a mass of cells called a tumor.

Description

Thyroid cancer is grouped into four types based on how its cells appear under a microscope. The types are papillary, follicular, medullary and anaplastic thyroid cancers. They grow at different rates and can spread to other parts of the body if left untreated.

The thyroid is a hormone-producing butterfly-shaped gland located in the neck at the base of the throat. It has two lobes, the left and the right. The thyroid uses iodine, a mineral found in some foods, to make several of its hormones. **Thyroid hormones** regulate essential body processes such as heart rate, blood pressure, body temperature, metabolism; and affect the nervous system, muscles and other organs. These hormones also play an important role in regulating childhood growth and development.

Diseases of the thyroid gland affect millions of Americans. The most common diseases of the thyroid are either **hyperthyroidism** (Graves' disease) or **hypothyroidism**, an overactive or an underactive gland, respectively. Sometimes lumps or masses may develop in the thyroid, and although most (ninety-five percent) of these lumps or nodules are noncancerous (benign), all thyroid lumps should be taken seriously. The American Cancer Society estimates that the approximately 17,200 new cases of thyroid cancer that occur in the United States account for 1% of all cancers.

Women are three times more likely to develop thyroid cancer than men. Although the disease affects teenagers and young adults, most people that develop thyroid cancer are over 50 years of age.

Causes and symptoms

The exact cause of thyroid cancer is not known; but it is more common in whites than in African Americans. Radiation was used in the 1950s and 1960s to treat **acne** and to reduce swelling in infections of the tonsils, adenoids and lymph nodes. It has been proven that this exposure is a risk factor for thyroid cancer. In some areas of the world, **diets** are low in iodine. Papillary and follicular cancers occur more frequently in these areas. Iodine deficiency is not a large problem in the United States because iodine is added to table salt and other foods. Approximately 7% of thyroid cancers are caused by the alteration (mutation) of a gene called the RET gene, which can be inherited.

Symptoms are rare so the lump is not usually painful. The symptoms of thyroid nodules are:

- a lump or nodule that can be felt in the neck is the most frequent sign of thyroid cancer
- the lymph nodes may be swollen and the voice may become hoarse because the tumor presses on the nerves leading to the voice box
- some patients experience a tight or full feeling in the neck and have difficulty breathing or swallowing

Diagnosis

Physicians use several tests to confirm the suspicion of thyroid cancer, to identify the size and location of the lump and to determine whether the lump is non-cancerous (benign) or cancerous (malignant). Blood tests such as the thyroid stimulating hormone (TSH) test check thyroid function. These are drawn by a technician with a needle and take a few minutes. It takes several days to be interpreted by a pathologist. Calcitonin is produced by the C cells (parafollicular cells) of the thyroid gland when the parafollicular cells of the thyroid become cancerous. Blood calcitonin levels are used to confirm the diagnosis of medullary thyroid cancer if it is suspected.

Computed tomography scan (CT scan) or an ultrasound (ultrasound scan) are imaging tests used to produce a picture of the thyroid and usually last less than one hour. A radiologist usually interprets the results within 24 hours. In ultrasonography, high-frequency sound waves are bounced off the thyroid. The pattern of echoes that is produced by these waves is converted into a computerized image on a television screen. This test can determine whether the lumps found in the thyroid are benign fluid-filled cysts or solid malignant tumors.

A radioactive scan may take several hours and can be used to identify any abnormal areas in the thyroid

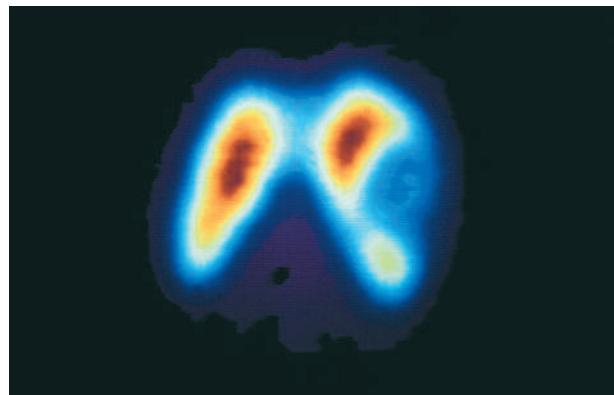
by giving the patient a very small amount of radioactive iodine, which can either be swallowed or injected into the thyroid. Since the thyroid is the only gland in the body that absorbs iodine, the radioactive iodine accumulates there. An x-ray image can then be taken or an instrument called a "scanner" can be used to identify areas in the thyroid that do not absorb iodine normally. These abnormal spots are called "cold spots" and further tests are performed to check whether the cold spots are benign or malignant tumors. If a significant amount of radioactive iodine is concentrated in the nodule, then it is termed "hot" and is usually benign. Again a radiologist interprets the results within a day.

The most accurate diagnostic tool for thyroid cancer is a biopsy. In this process a sample of thyroid tissue is withdrawn and examined under a microscope by a pathologist. This usually takes a day or so. The tissue samples can be obtained either by drawing out a sample of tissue through a needle (needle biopsy) or by surgical removal of the nodule (surgical biopsy). A needle biopsy takes a few minutes and can be done by any trained physician, usually a radiologist. The surgical biopsy is done by a surgeon under general anesthesia with the help of an anesthesiologist and will take a few hours. If thyroid cancer is diagnosed, further tests may be done to learn about the stage of the disease and help doctors plan appropriate treatment.

Treatment

The aggressiveness of each type of thyroid cancer is different. Cancer staging considers the size of the tumor, whether it has grown into surrounding lymph nodes and whether it has spread to distant parts of the body (metastasized). Age and general health status are also taken into account. In patients less than 45 years old there are only two stages. I papillary or follicular type thyroid cancer, stage I refers to patients without evidence of cancer that has spread to the body. Stage II refers to patients with spread of cancer outside the thyroid gland. In patients over 45, patients with tumors smaller than one cm are classified as stage I, those with tumors not broken through the capsule (covering) of the thyroid belong to stage II, those with tumors outside the capsule or lymph node involvement are called stage III and those with spread outside the thyroid area are stage IV. In medullary-type thyroid cancer, stage I and IV are the same. Stage II consists of patients with tumors greater than one cm and stage III comprises patients with lymph node involvement.

The papillary type (60–80% of all thyroid cancers) is a slow-growing cancer that develops in the hormone-



A gamma scan of the human thyroid gland revealing cancer.
(Custom Medical Stock Photo. Reproduced by permission.)

producing cells (that contain iodine) and can be treated successfully. The follicular type (30–50% of thyroid cancers) also develops in the hormone-producing cells, has a good cure rate but may be difficult to control if the cancer invades blood vessels or grows into nearby structures in the neck. The medullary type (5–7% of all thyroid cancers) develops in the parafollicular cells (also known as the C cells) that produce calcitonin, a hormone that does not contain iodine. Medullary thyroid cancers are more difficult to control because they often spread to other parts of the body. The fourth type of thyroid cancer, anaplastic (2% of all thyroid cancers), is the fastest growing and is usually fatal because the cancer cells rapidly spread to the different parts of the body.

More than 90% of patients who are treated for papillary or follicular cancer will live for 15 years or longer after the diagnosis of thyroid cancer. Eighty percent of patients with medullary thyroid cancer will live for at least 10 years after surgery. Only 3–17% of patients with anaplastic cancer survive for five years.

Like most cancers, cancer of the thyroid is best treated when it is found early by a primary physician. Treatment depends on the type of cancer and its stage. Four types of treatment are used: surgical removal, **radiation therapy**, hormone therapy and **chemotherapy**. Surgical removal is the usual treatment if the cancer has not spread to distant parts of the body.

The surgeon may remove the side or lobe of the thyroid where the cancer is found (lobectomy) or all of it (total **thyroidectomy**). If the adjoining lymph nodes are affected, they may also be removed during surgery. When the thyroid gland is removed and levels of thyroid hormones decrease, the pituitary gland starts to produce TSH that stimulates the thyroid cells to grow.

A radiation-oncologist uses radiation therapy with high-energy x-rays to kill cancer cells and shrink tumors. The radiation may come from a machine outside the body (external beam radiation), or the patient may be asked to swallow a drink containing radioactive iodine. Because the thyroid cells take up iodine, the radioactive iodine collects in any thyroid tissue remaining in the body and kills the cancer cells. A hematologist-oncologist uses chemotherapy either as a pill or an injection through a vein in the arm.

Alternative treatment

Hormone therapy uses hormones after surgery to stop this growth and the formation of new cancerous thyroid cells. To prevent cancerous growth, the natural hormones that are produced by the thyroid are taken in the form of pills. Thus, their levels remain normal and inhibit the pituitary gland from making TSH. If the cancer has spread to other parts of the body and surgery is not possible, hormone treatment is aimed at killing or slowing the growth of cancer cells throughout the body.

A powerful phytochemical, lycopene, gives tomatoes their red color and appears to act as an antioxidant in the body, repairing damaged cells and scavenging free radicals, the molecules responsible for most types of degenerative diseases and **aging**. Antioxidants such as lycopene help inhibit DNA oxidation, which can lead to certain forms of cancer. Lycopene is a normal constituent of human blood and tissues, where it is found in greater concentrations than beta-carotene or any other carotenoid. Tomatoes, including cooked or processed tomatoes, tomato juices, soups, sauces, paste and ketchup, contain more lycopene than any other food. Guava, rose hip, watermelon and grapefruit also contain lycopene.

Other antioxidants are: vitamin E (Dosage: 400 IU daily), vitamin C (Dosage: 1,000 to 4,000 mg daily), beta carotene (Dosage: 15 mg (25,000 IU) daily), lutein (Dosage: 6 to 20 mg daily), pycnogenol (Dosage: 25 to 50 mg daily), green tea (Dosage: 300 to 400 mg of green tea polyphenols daily), grape-seed extract (Dosage: 100 mg daily), alpha lipoic acid (Dosage: 50 to 200 mg daily), N-acetylcysteine (Dosage: 600 mg daily) and selenium (Dosage: 200 to 400 mcg daily). Pregnant women should consult a physician before taking any medication.

Prevention

Because most people with thyroid cancer have no known risk factor, it is not possible to completely prevent this disease. However, inherited cases of medullary thyroid cancer can be prevented if radiation to the neck is

KEY TERMS

Biopsy—The surgical removal and microscopic examination of living tissue for diagnostic purposes.

Calcitonin—A hormone produced by the parafollicular cells (C cells) of the thyroid. The main function of the hormone is to regulate calcium levels in body serum.

Chemotherapy—Treatment of cancer with synthetic drugs that destroy the tumor either by inhibiting the growth of the cancerous cells or by killing them.

Hormone therapy—Treatment of cancer by inhibiting the production of such hormones as testosterone and estrogen.

Hyperthyroidism—A condition in which the thyroid is overactive due to overstimulation of the thyroid cells.

Hypothyroidism—A condition in which the thyroid gland is underactive.

Lobectomy—A surgical procedure that removes one lobe of the thyroid.

Radiation therapy—Treatment with high-energy radiation from x-ray machines, cobalt, radium, or other sources.

Total thyroidectomy—A surgical procedure that removes the entire thyroid gland.

avoided. If a family member has had this disease, the rest of the family can be tested and treated early. The National Cancer Institute recommends that a doctor examine anyone who has received radiation to the head and neck during childhood at intervals of one or two years. The neck and the thyroid should be carefully examined for any lumps or enlargement of the nearby lymph nodes. Ultrasound may also be used to screen for the disease in people at risk for thyroid cancer.

Resources

BOOKS

Current Surgical Therapy. 6th ed. Ed. John L. Cameron. Harcourt Brace, 1998.

Harrison's Principles of Internal Medicine. 13th ed. Ed. Eugene Braunwald, et al. McGraw-Hill, 1995.

Schwarz's Principles of Surgery. 6th ed. Ed. Seymour Schwartz, et al. McGraw-Hill, 1998.

ORGANIZATIONS

National Cancer Institute—Cancernet. <<http://www.nci.nih.gov/index.html>>.

Kulbir Rangi, DO

Thyroid drugs see **Thyroid hormones**

Thyroid function tests

Definition

Thyroid function tests are blood tests used to evaluate how effectively the thyroid gland is working. These tests include the thyroid-stimulating hormone test (TSH), the thyroxine test (T_4), the triiodothyronine test (T_3), the thyroxine-binding globulin test (TBG), the triiodothyronine resin uptake test (T_3 RU), and the long-acting thyroid stimulator test (LATS).

Purpose

Thyroid function tests are used to:

- help diagnose an underactive thyroid (**hypothyroidism**) and an overactive thyroid (**hyperthyroidism**)
- evaluate thyroid gland activity
- monitor response to thyroid therapy

Precautions

Thyroid treatment must be stopped one month before blood is drawn for a thyroxine (T_4) test.

Steroids, propranolol (Inderal), cholestyramine (Questran), and other medications that may influence thyroid activity are usually stopped before a triiodothyronine (T_3) test.

Estrogens, anabolic steroids, phenytoin, and thyroid medications may be discontinued prior to a thyroxine-binding globulin (TBG) test. The laboratory analyzing the blood sample must be told if the patient cannot stop taking any of these medications. Some patients will be told to take these medications as usual so that the doctor can determine how they affect thyroxine-binding globulin.

Patients are asked not to take estrogens, androgens, phenytoin (Dilantin), salicylates, and thyroid medications before having a triiodothyronine resin uptake (T_3 RU) test.

Prior to taking a long-acting thyroid stimulant (LATS) test, the patient will probably be told to stop taking all drugs that could affect test results.

Description

Most doctors consider the sensitive thyroid-stimulating hormone (TSH) test to be the most accurate measure of thyroid activity. By measuring the level of TSH, doctors can determine even small problems in thyroid activity. Because this test is sensitive, abnormalities in thyroid function can be determined before a patient complains of symptoms.

TSH “tells” the thyroid gland to secrete the hormones thyroxine (T_4) and triiodothyronine (T_3). Before TSH tests were used, standard blood tests measured levels of T_4 and T_3 to determine if the thyroid gland was working properly. The triiodothyronine (T_3) test measures the amount of this hormone in the blood. T_3 is normally present in very small amounts, but has a significant impact on metabolism. It is the active component of thyroid hormone.

The thyroxine-binding globulin (TBG) test measures blood levels of this substance, which is manufactured in the liver. TBG binds to T_3 and T_4 , prevents the kidneys from flushing the hormones from the blood, and releases them when and where they are needed to regulate body functions.

The triiodothyronine resin uptake (T_3 RU) test measures blood T_4 levels. Laboratory analysis of this test takes several days, and it is used less often than tests whose results are available more quickly.

The long-acting thyroid stimulator (LATS) test shows whether blood contains long-acting thyroid stimulator. Not normally present in blood, LATS causes the thyroid to produce and secrete abnormally high amounts of hormones.

It takes only minutes for a nurse or medical technician to collect the blood needed for these blood tests. A needle is inserted into a vein, usually in the forearm, and a small amount of blood is collected and sent to a laboratory for testing. The patient will usually feel minor discomfort from the “stick” of the needle.

Preparation

There is no need to make any changes in diet or activities. The patient may be asked to stop taking certain medications until after the test is performed.

Aftercare

Warm compresses can be used to relieve swelling or discomfort at the site of the puncture. With a doctor’s approval, the patient may start taking medications stopped before the test.

Normal results

Not all laboratories measure or record thyroid hormone levels the same way. Each laboratory will provide a range of values that are considered normal for each test. Some acceptable ranges are listed below.

TSH

Normal TSH levels for adults are 0.5–5.0 mU/L.

T_4

Normal T_4 levels are:

- 10.1–2.0 ug/dl at birth
- 7.5–16.5 ug/dl at one to four months
- 5.5–14.5 ug/dl at four to 12 months
- 5.6–12.6 ug/dl at one to six years
- 4.9–11.7 ug/dl at six to 10 years
- 4–11 ug/dl at 10 years and older.

Levels of free T_4 (thyroxine not attached to TBG) are higher in teenagers than in adults.

Normal T_4 levels do not necessarily indicate normal thyroid function. T_4 levels can register within normal ranges in a patient who:

- is pregnant
- has recently had contrast x rays
- has nephrosis or **cirrhosis**

T_3

Normal T_3 levels are:

- 90–170 ng/dl at birth
- 115–190 ng/dl at six to 12 years
- 110–230 ng/dl in adulthood.

TBG

Normal TBG levels are:

- 1.5–3.4 mg/dl or 15–34 mg/L in adults
- 2.9–5.4 mg/dl or 29–54 mg/L in children.

T_3RU

Between 25% and 35% of T_3 should bind to or be absorbed by the resin added to the blood sample. The test indirectly measures the amount of thyroid binding globulin (TBG) and thyroid-binding prealbumin (TBPA) in the blood.

LATS

Long-acting thyroid stimulator is found in the blood of only 5% of healthy people.

Abnormal results

T_4

Elevated T_4 levels can be caused by:

- acute thyroiditis
- birth control pills
- clofibrate (Altromed-S)
- contrast x rays using iodine
- estrogen therapy
- heparin
- heroin
- hyperthyroidism
- **pregnancy**
- thyrotoxicosis
- toxic thyroid adenoma

Cirrhosis and severe non-thyroid disease can raise T_4 levels slightly.

Reduced T_4 levels can be caused by:

- anabolic steroids
- androgens
- antithyroid drugs
- cretinism
- hypothyroidism
- kidney failure
- lithium (Lithane, Lithonate)
- myxedema
- phenytoin
- propranolol

T_3

Although T_3 levels usually rise and fall when T_4 levels do, T_3 toxicosis causes T_3 levels to rise while T_4 levels remain normal. T_3 toxicosis is a complication of:

- Graves' disease
- toxic adenoma
- toxic nodular goiter

T_3 levels normally rise when a woman is pregnant or using birth-control pills. Elevated T_3 levels can also occur in patients who use estrogen or **methadone** or who have:

- certain genetic disorders that do not involve thyroid malfunction

KEY TERMS

Acidosis—A condition in which blood and tissues are unusually acidic.

Acromegaly—A disorder in which growth hormone (a chemical released from the pituitary gland in the brain) causes increased growth in bone and soft tissue. Patients have enlarged hands, feet, noses, and ears, as well as a variety of other disturbances throughout the body.

Acute intermittent porphyria—An inherited disease affecting the liver and bone marrow. The liver overproduces a specific acid and the disease is characterized by attacks of high blood pressure, abdominal colic, psychosis, and nervous system disorders.

Anabolic steroids—Protein-building compounds used to treat certain anemias and cancers, strengthen bones, and stimulate weight gain and growth. Anabolic steroids are sometimes used to illegally enhance athletic performance.

Cholestyramine (Questran)—A drug used to bind with bile acids and prevent their reabsorption and to stimulate fat absorption.

Cirrhosis—Progressive disease of the liver, associated with failure in liver cell functioning and blood flow in the liver. Tissue and cells are damaged, the liver becomes fibrous, and jaundice can result.

Clofibrate (Altromed-S)—Medication used to lower levels of blood cholesterol and triglycerides.

Cretinism—Severe hypothyroidism that is present at birth and characterized by severe mental retardation.

Graves' disease—The most common form of hyperthyroidism, characterized by bulging eyes, rapid heart rate, and other symptoms.

Heparin—An organic acid that occurs naturally in the body and prevents blood clots. Heparin is also made synthetically and can be given as a treatment when required.

Hepatitis—Inflammation of the liver.

Hyperthyroidism—Overactive thyroid gland; symptoms include irritability/nervousness, muscle weakness, tremors, irregular menstrual periods, weight loss, sleep problems, thyroid enlargement, heat sen-

sitivity, and vision/eye problems. The most common type of this disorder is called Graves' disease.

Hypoproteinemia—Abnormally low levels of protein in the blood.

Hypothyroidism—Underactive thyroid gland; symptoms include fatigue, difficulty swallowing, mood swings, hoarse voice, sensitivity to cold, forgetfulness, and dry/coarse skin and hair.

Lithium (Lithane, Lithromate)—Medication prescribed to treat manic (excited) phases of bipolar disorder.

Myxedema—Hypothyroidism, characterized by thick, puffy features, an enlarged tongue, and lack of emotion.

Nephrosis—Any degenerative disease of the kidney (not to be confused with nephritis, an inflammation of the kidney due to bacteria).

Nodular goiter—An enlargement of the thyroid (goiter) caused when groups of cells collect to form nodules.

Phenytoin (Dilantin)—Anti-convulsive medication used to treat seizure disorders.

Propranolol (Inderal)—Medication commonly prescribed to treat high blood pressure; is a beta-adrenergic blocker and can also be used to treat irregular heartbeat, heart attack, migraine, and tremors.

Reserpine (Serpasil)—A drug prescribed for high blood pressure.

Salicylates—Aspirin and certain other nonsteroidal anti-inflammatory drugs (NSAIDs).

Thiazides—A group of drugs used to increase urine output.

Thyroid gland—A butterfly-shaped gland in front and to the sides of the upper part of the windpipe; influences body processes like growth, development, reproduction, and metabolism.

Thyroiditis—Inflammation of the thyroid gland.

Thyrotoxicosis—A condition resulting from high levels of thyroid hormones in the blood.

Toxic thyroid adenoma—Self-contained concentrations of thyroid tissue that may produce excessive amounts of thyroid hormone.

- hyperthyroidism
- thyroiditis
- T₃ thyrotoxicosis
- toxic adenoma.

Low T₃ levels may be a symptom of:

- acute or chronic illness
- hypothyroidism
- kidney or liver disease
- starvation.

Decreased T₃ levels can also be caused by using:

- anabolic steroids
- androgens
- phenytoin
- propranolol
- reserpine (Serpasil)
- salicylates in high doses

TBG

TBG levels, normally high during pregnancy, are also high in newborns. Elevated TBG levels can also be symptoms of:

- acute hepatitis
- acute intermittent porphyria
- hypothyroidism
- inherited thyroid hormone abnormality

TBG levels can also become high by using:

- anabolic steroids
- birth control pills
- anti-thyroid agents
- clofibrate
- estrogen therapy
- phenytoin
- salicylates in high doses
- thiazides
- thyroid medications
- warfarin (Coumadin)

TBG levels can be raised or lowered by inherited liver disease whose cause is unknown.

Low TBG levels can be a symptom of:

- acromegaly
- acute hepatitis or other acute illness
- hyperthyroidism
- kidney disease
- malnutrition

- marked hypoproteinemia
- uncompensated acidosis

T₃RU

A high degree of resin uptake and high thyroxine levels indicate hyperthyroidism. A low degree of resin uptake, coupled with low thyroxine levels, is a symptom of hypothyroidism.

Thyroxine and triiodothyronine resin uptake that are not both high or low may be a symptom of a thyroxine-binding abnormality.

LATS

Long-acting thyroid stimulator, not usually found in blood, is present in the blood of 80% of patients with Graves' disease. It is a symptom of this disease whether or not symptoms of hyperthyroidism are detected.

Resources

BOOKS

A Manual of Laboratory and Diagnostic Tests. 5th ed. Ed. Francis Fishback. Philadelphia: Lippincott, 1996.

Pagana, Kathleen Deska. Mosby's Manual of Diagnostic and Laboratory Tests. St. Louis: Mosby, Inc., 1998.

Everything You Need to Know About Medical Tests. Ed.

Michael Shaw, et al. Springhouse, PA: Springhouse Corporation, 1996.

ORGANIZATIONS

The American Thyroid Association, Inc. Montefiore Medical Center, 111 E. 210th St., Bronx, NY 10467. <<http://www.thyroid.org>>.

The Thyroid Foundation of America, Inc. Ruth Sleeper Hall, RSL350, 40 Parkman St., Boston, MA 02114-2698. (800) 832-8321. <<http://www.tfaeweb.org/pub/tfa>>.

Maureen Haggerty

Thyroid gland removal see **Thyroidectomy**

Thyroid hormones

Definition

Thyroid hormones are artificially made hormones that make up for a lack of natural hormones produced by the thyroid gland.

Purpose

The thyroid gland, a butterfly-shaped structure in the lower part of the neck, normally produces a hormone

called thyroxine. This hormone controls the rate of metabolism—all the physical and chemical processes that occur in cells to allow growth and maintain body functions. When the thyroid gland does not produce enough thyroxine, body processes slow down. People with underactive thyroid glands feel unusually tired and may gain weight even though they eat less. They may also have trouble staying warm and may have other symptoms, such as dry skin, dry hair, and a puffy face. By making up for the lack of natural thyroxine and bringing the rate of metabolism back to normal, artificially made thyroid hormone improves these symptoms.

Thyroid hormones also may be used to treat **goiter** (enlarged thyroid gland) and certain types of **thyroid cancer**.

Description

Thyroid hormones, also called thyroid drugs, are available only with a physician's prescription. They are sold in tablet form. A commonly used thyroid hormone is levothyroxine (Synthroid, Levoxyl, Levothroid).

Recommended dosage

For adults and teenagers, the usual starting dose of levothyroxine tablets is 0.0125 mg (12.5 micrograms) to 0.05 mg (50 micrograms) per day. The physician who prescribes the medicine may gradually increase the dose over time.

For children, the dose depends on body weight and must be determined by a physician.

Taking thyroid hormones exactly as directed is very important. The physician who prescribes the medicine will figure out exactly how much of the medicine a patient needs. Taking too much or too little can make the thyroid gland overactive or underactive.

This medicine should be taken at the same time every day.

Precautions

People who take thyroid hormones because their thyroid glands do not produce enough natural hormone may need to take the medicine for the rest of their lives. Seeing a physician regularly while taking this medicine is important. The physician will make sure that the medicine is working and that the dosage is correct.

In patients with certain kinds of heart disease, this medicine may cause chest pains and **shortness of breath** during **exercise**. People who have this problem should be careful not to exert themselves too much.

Anyone who is taking thyroid hormones should be sure to tell the health care professional in charge before having any surgical or dental procedures or receiving emergency treatment.

This medicine is safe to take during **pregnancy**, but the dosage may need to be changed. Women who are pregnant should check with their physicians to make sure they are taking the proper dosage.

Anyone who has had unusual reactions to thyroid hormones in the past should let his or her physician know before taking the drugs again. The physician should also be told about any **allergies** to foods, dyes, preservatives, or other substances.

Before using thyroid hormones, people with any of these medical problems should make sure their physicians are aware of their conditions:

- heart disease
- high blood pressure
- hardening of the arteries
- diabetes
- history of overactive thyroid
- underactive adrenal gland
- underactive pituitary gland

Side effects

This medicine usually does not cause side effects if the dosage is right. Certain symptoms may be signs that the dose needs to be changed. Check with a physician if any of these symptoms occur:

- headache
- **fever**
- diarrhea
- vomiting
- changes in appetite
- weight loss
- changes in menstrual period
- tremors of the hands
- leg cramps
- increased sensitivity to heat
- sweating
- irritability
- nervousness
- sleep problems

KEY TERMS

Adrenal glands—A pair of glands located next to the kidneys. The adrenal glands produce hormones that control many body functions.

Hormone—A chemical that is produced in one part of the body and then travels through the bloodstream to another part of the body where it has its effect.

Pituitary gland—A pea-sized gland at the base of the brain that produces many hormones that affect growth and body functions.

Other side effects are possible. Anyone who has unusual symptoms while taking thyroid hormones should get in touch with his or her physician.

Interactions

Thyroid hormones may interact with other medicines. This may increase or decrease the effects of the thyroid medicine and may interfere with treatment. Anyone who takes thyroid hormones should not take any other prescription or nonprescription (over-the-counter) medicines without the approval of his or her physician. Among the drugs that may interact with thyroid hormones are:

- Medicine for colds, hay fever, and other allergies
- Medicine for **asthma** and other breathing problems
- Medicine for diabetes
- Blood thinners
- Amphetamines
- Diet pills (appetite suppressants)
- Cholesterol-lowering drugs such as cholestyramine (Questran) and colestipol (Colestid)

Nancy Ross-Flanigan

Thyroid nuclear medicine scan

Definition

A thyroid nuclear medicine scan is a diagnostic procedure to evaluate the thyroid gland, which is located in the front of the neck and controls the body's metabolism.

A radioactive substance that concentrates in the thyroid is taken orally or injected into a vein (intravenously), or both. A special camera is used to take an image of the distribution of the radioactive substance in and around the thyroid gland. This is interpreted to evaluate thyroid function and to diagnose abnormalities.

Purpose

A thyroid scan may be ordered by a physician when the gland becomes abnormally large, especially if the enlargement is greater on one side, or when hard lumps (nodules) are felt. The scan can be helpful in determining whether the enlargement is caused by a diffuse increase in the total amount of thyroid tissue or by a nodule or nodules.

When other laboratory studies show an overactive thyroid (**hyperthyroidism**) or an underactive thyroid (**hypothyroidism**), a radioactive iodine uptake scan is often used to confirm the diagnosis. It is frequently done along with a thyroid scan.

Precautions

Women who are pregnant should not have this test.

Description

This test is performed in a radiology facility, either in an outpatient x ray center or a hospital department. Most often, the patient is given the radioactive substance in the form of a tasteless liquid or capsule. It may be injected into a vein (intravenously) in some instances. Images will be taken at a specified amount of time after this, depending on the radioisotope used. Most often, scanning is done 24 hours later, if the radioisotope is given orally. If it is given intravenously, the scan is performed approximately 20 minutes later.

For a thyroid scan, the patient is positioned lying down on his or her back, with the head tilted back. The radionuclide scanner, also called a gamma camera, is positioned above the thyroid area as it scans. This takes 30-60 minutes.

The uptake study may be done with the patient sitting upright in a chair or lying down. The procedure is otherwise the same as described for the thyroid scan. It takes approximately 15 minutes. There is no discomfort involved with either study.

A thyroid scan may also be referred to as a thyroid scintiscan. The name of the radioactive substance used may be incorporated and the study called a technetium thyroid scan or an iodine thyroid scan. The radioactive iodine uptake scan may be called by its initials, an RAIU test, or an iodine uptake test.

Preparation

Certain medications can interfere with iodine uptake. These include certain **cough** medicines, some **oral contraceptives**, and thyroid medications. The patient is usually instructed to stop taking these medicines for a period of time before the test. This period may range from several days up to three to four weeks, depending on the amount of time the medicine takes to clear from the body.

Other nuclear medicine scans and x ray studies using contrast material performed within the past 60 days may affect this test. Therefore, patients should tell their doctors if they have had either of these types of studies before the thyroid scan is begun, to avoid inaccurate results.

Some institutions prefer that the patient have nothing to eat or drink after midnight on the day before the radioactive liquid or capsule is to be taken. A normal diet can usually be resumed two hours after the radioisotope is taken. Dentures, jewelry, and other metallic objects must be removed before the scanning is performed. No other physical preparation is needed.

The patient should understand that there is no danger of radiation exposure to themselves or others. Only very small amounts of radioisotope are used. The total amount of radiation absorbed is often less than the dose received from ordinary x rays. The scanner or camera does not emit any radiation, but detects and records it from the patient.

Aftercare

No **isolation** or special precautions are needed after a thyroid scan. The patient should check with his or her physician about restarting any medications that were stopped before the scan.

Risks

There are no risks with this procedure.

Normal results

A normal scan will show a thyroid of normal size, shape, and position. The amount of radionuclide uptake by the thyroid will be normal according to established laboratory figures. There will be no areas where radionuclide uptake is increased or decreased.

Abnormal results

An area of increased radionuclide uptake may be called a **hot nodule** or “hot spot.” This means that a benign growth is overactive. Despite the name, hot nodules are unlikely to be caused by **cancer**.

KEY TERMS

Radioisotope—A radioactive or radiation-emitting form of an element.

Radionuclide—A substance that emits radiation as it disintegrates.

An area of decreased radionuclide uptake may be called a **cold nodule** or “cold spot.” This indicates that this area of the thyroid gland is underactive. A variety of conditions, including cysts, nonfunctioning benign growths, localized inflammation, or cancer may produce a cold spot.

A thyroid nuclear medicine scan is rarely sufficient to establish a clear diagnosis. Frequently, the information revealed will need to be combined with data from other studies to determine the problem.

Resources

BOOKS

Goldsmith, Stanley J. “Endocrine System.” In *Nuclear Medicine*, ed. Donald R. Bernier, et al. St. Louis: Mosby, 1997.

PERIODICALS

Rifat, Sami T., and Mack T. Ruffin. “Management of Thyroid Nodules.” *American Family Physician* 50 (15 Sept. 1994): 785-791.

Ellen S. Weber, MSN

Thyroid sonogram see **Thyroid ultrasound**

Thyroid ultrasound

Definition

Thyroid ultrasound is an imaging technique used for diagnosing suspected thyroid disease. It uses harmless, high-frequency sound waves to form an image. The sound waves are reflected by thyroid tissue to form a picture of internal structures. It is not invasive and involves no radiation.

Purpose

The thyroid gland is an organ located in front of the neck. It plays an important role in controlling the body’s metabolism. Most thyroid ultrasounds are performed to evaluate a small lump (nodule) in the thyroid found during a **physical examination** or found by a radionuclide

study (thyroid scan). The ultrasound can establish if the nodule is a cyst, which is an abnormal lump that contains fluid, or a solid mass. Cysts are almost always non-cancerous (benign), although in some cases the fluid may be taken out for additional testing.

If there are several masses or nodules, this indicates the presence of enlargement of the thyroid gland (**goiter**). If there is only one mass, it may be cancerous and needs further evaluation. Specialized thyroid ultrasounds, such as color Doppler flow studies, can add valuable information. By showing an image of the blood circulation in the gland, this study can assess some ambiguous masses in greater detail, to further refine diagnosis. In some cases, a needle will be inserted to remove some tissue from the mass for evaluation in a laboratory (needle biopsy). Ultrasound is used during this procedure to help the physician guide the needle to the mass that needs to be evaluated.

Thyroid ultrasound can measure the size of the thyroid with great precision. Ultrasound studies may be done periodically to assess the response of the thyroid gland to medical therapy. An enlarged gland or a benign nodule should decrease in size when appropriate thyroid medication is taken.

Patients who have received therapeutic radiation to the head or neck may be monitored at regular intervals using thyroid ultrasound. The radiation puts these patients at higher risk for developing **thyroid cancer** or other abnormalities. In the early stages, these conditions may not cause symptoms or be apparent during a physical examination. They can, however, be detected by ultrasound.

Certain invasive medical procedures may be performed under ultrasound guidance. This is because ultrasound allows the physician to observe a needle as it enters body tissue below the skin. This is useful to direct the removal of fluid from a cyst (aspiration) or needle biopsy. Medications to treat recurrent cysts may be administered directly to the area using ultrasound guidance.

Precautions

Thyroid ultrasound is safe for people of all ages. It is the preferred procedure to evaluate suspected disease in pregnant women because no radiation is involved.

Description

The study may be done in an outpatient facility or in a hospital department. The patient lies on his or her back. A pillow or rolled towel is placed under the shoulders and upper back, allowing the head to tilt back (hyperextend). A gel that enhances sound transmission is spread over the thyroid area. The technologist then gently places a transducer, an instrument about the size of an electric

shaver, against the skin. It is moved over the thyroid area. The images from reflected sound waves appear on a monitor screen. There is no discomfort involved with this study. The examination takes 15–30 minutes.

Preparation

Some facilities recommend limiting food and drink for one hour before the study to prevent discomfort. No other preparation is needed.

Aftercare

No special restrictions or procedures are needed after a thyroid ultrasound.

Risks

There are no risks with this procedure.

Normal results

A normal study would reveal a thyroid gland of normal size, shape, position, and uniform texture.

Abnormal results

A thyroid ultrasound may reveal cysts, solid masses that may or may not be cancerous, or an enlarged thyroid gland (goiter). In many cases, the ultrasound can establish a diagnosis. Sometimes the information revealed will need to be combined with data from other studies to determine the problem.

Resources

PERIODICALS

Rifat, Sami F., and Mack T. Ruffin. "Management of Thyroid Nodules." *American Family Physician* 50 (15 Sept. 1994): 785-791.

Ellen S. Weber, MSN

Thyroid storm see **Hyperthyroidism**

Thyroid x ray see **Thyroid nuclear medicine scan**

Thyroidectomy

Definition

Thyroidectomy is a surgical procedure in which all or part of the thyroid gland is removed. The thyroid gland is located in the forward part of the neck (anterior) just under the skin and in front of the Adam's apple.

Purpose

All or part of the thyroid gland may be removed to correct a variety of abnormalities of the gland. If the patient has a **goiter** (an enlargement of the thyroid gland, causing a swelling in the front of the neck), it may cause difficulties with swallowing or breathing. **Hyperthyroidism** (over-functioning of the thyroid gland) produces hypermetabolism (abnormally increased use of oxygen, nutrients, and other materials). If medication cannot adequately treat this condition, or if the patient is a child or pregnant, the thyroid gland must be removed. Both cancerous tumors and noncancerous tumors (frequently called nodules) can occur and they must be removed, in addition to some or all of the thyroid gland.

Precautions

There are definite risks associated with the procedure. Therefore, the thyroid gland should be removed only if there is a pressing reason or medical condition that requires it.

Description

Thyroidectomy is an operative procedure done most commonly by a general surgeon, or occasionally by an otolaryngologist, in the operating room of a hospital. The operation begins when an anesthesiologist puts the patient to sleep. The anesthesiologist injects drugs into the patient's veins and then places an airway tube in the windpipe to ventilate (provide air for) the patient. The surgeon makes an incision in the front of the neck where a tight-fitting necklace would rest. He locates and takes care not to injure the parathyroid glands and the recurrent laryngeal nerves, while freeing the thyroid gland from these surrounding structures. The blood supply to the portion of the thyroid gland that is to be removed is clamped off. Then all or part of the gland is removed. If **cancer** is present, all, or almost all, of the gland is removed. If other diseases or a nodule is present, the surgeon may remove only part of the gland. The total amount of thyroid gland removed depends upon the thyroid disease being treated. A drain (a soft plastic tube that drains fluid out of the area) may be placed before the incision is closed. The incision is closed either with sutures (stitches) or metal clips. A dressing is placed over the incision and the drain, if one is used.

Patients generally stay in the hospital one to four days after completion of the operation.

Preparation

Before a thyroidectomy is performed, a variety of tests and studies are usually required to determine the

nature of the thyroid disease. Laboratory analysis of blood determines the levels of active thyroid hormone circulating in the body. Sonograms and **computed tomography scans** (CT scans) help to determine the size of the thyroid gland and location of abnormalities. A **thyroid nuclear medicine scan** assesses the function of the gland. A needle biopsy of an abnormality or aspiration (removal by suction) of fluid from the thyroid gland may also be done to help determine the diagnosis.

If the diagnosis is hyperthyroidism, the patient may be asked to take antithyroid medication or iodides before the operation; or continued treatment with antithyroid drugs may be the treatment of choice. Otherwise, no other special procedure must be followed prior to the operation.

Aftercare

The incision requires little to no care after the dressing is removed. The area may be bathed gently with a mild soap. The sutures or the metal clips are removed three to seven days after the operation.

Risks

As with all operations, patients who are obese, smoke, or have poor **nutrition** are at greater risk for developing complications related to the general anesthetic itself.

Hoarseness or voice loss may develop if the recurrent laryngeal nerve was injured or destroyed during the operation. This is more apt to occur in patients who have large goiters or cancerous tumors.

Hypoparathyroidism (under-functioning of the parathyroid glands) can occur if the parathyroid glands are injured or removed at the time of the thyroidectomy.

Hypothyroidism (under-functioning of the thyroid gland) can occur if all or nearly all of the thyroid gland is removed. This may be intentional when the diagnosis is cancer. If the patient's thyroid levels remain high, he may be required to take thyroid replacement for the rest of his life.

The neck and the area surrounding the thyroid gland have a rich supply of blood vessels. Bleeding in the area of the operation may occur and be difficult to control or stop. Rarely is a blood **transfusion** required, although a hematoma (collection of blood) may develop. If this occurs, it may be life-threatening. As the hematoma enlarges, it may obstruct the airway and cause the patient to stop breathing. If a hematoma does develop in the neck, it may require drainage to clear the airway.

Wound infections can occur. If they do, the incision is drained, and there are usually no serious consequences.

KEY TERMS

Endocrinologist—A physician who specializes in treating patients who have diseases of the thyroid, parathyroid, adrenal glands, and/or the pancreas.

Hyperthyroidism—Abnormal over-functioning of the thyroid glands. Patients are hypermetabolic, lose weight, are nervous, have muscular weakness and fatigue, sweat more, and have increased urination and bowel movements. This is also called thyrotoxicosis.

Hypothyroidism—Abnormal under-functioning of the thyroid gland. Patients are hypometabolic, gain weight, and are sluggish.

Recurrent laryngeal nerve—A nerve that lies very near the parathyroid glands and serves the larynx or voice box.

Normal results

Most patients are discharged from the hospital one to four days after the procedure. Most resume their normal activities two weeks after the operation. Patients who have cancer may require subsequent treatment by an oncologist or a endocrinologist.

Resources

BOOKS

- Kaplan, Edwin. "Thyroid and Parathyroid." In *Principles of Surgery*, ed. Seymour I. Schwartz, et al. New York: McGraw-Hill, 1994.
 "Thyroidectomy." In *The American Medical Association Encyclopedia of Medicine*, ed. Charles B. Claymon. New York: Random House, 1989.

OTHER

- "Thyroid Gland Removal." *ThriveOnline*. <<http://thriveonline.oxygen.com>>.

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Thyroiditis

Definition

Thyroiditis is inflammation of the thyroid gland, a butterfly-shaped organ next to the windpipe.

Description

The thyroid is the largest gland in the neck. It produces, secretes, and stores thyroxine (T_4), a hormone that influences the metabolism of just about every body process.

When the thyroid gland is functioning properly, hormone release is carefully regulated. When bacteria or viruses invade and inflame the gland, T_4 surges into the bloodstream and raises hormone levels that then discourage the gland from creating more T_4 . Eventually the hormone stores are exhausted, the thyroid loses its ability to manufacture T_4 , and an underactive thyroid (**hypothyroidism**) results.

The major cause of hypothyroidism, thyroiditis affects about 12 million people in the United States. This condition is more common in women than in men and usually develops between ages 30–50.

Hashimoto's disease

The most common type of thyroiditis is Hashimoto's disease, a painless disorder also known as:

- autoimmune thyroiditis
- chronic lymphocytic thyroiditis
- lymphadenoid goiter
- struma lymphomatosa

Hashimoto's disease can develop at any age, but is most common in middle-aged women. This immune system disorder runs in families, and affects about 5% of adults in the United States.

Hashimoto's disease slowly destroys thyroid tissue and robs the gland of its ability to change iodine into T_4 . The condition progresses so gradually that many people who have it do not realize anything is wrong until the enlarged gland forms a goiter, a swelling seen and felt in the front of the neck. This may not happen until weeks or even years after an individual develops Hashimoto's.

Subacute thyroiditis

Much less common than Hashimoto's disease, subacute thyroiditis is a painful inflammation that develops suddenly in a patient who has had a viral infection, such as **mumps** or an upper respiratory illness. **Pain** radiates throughout the neck and patients feel ill and feverish. It may take as long as several months for normal thyroid function to resume.

Subacute thyroiditis is also called:

- DeQuervain's thyroiditis
- giant cell thyroiditis

- granulomatous thyroiditis
- subacute granulomatous thyroiditis

Silent thyroiditis

The least common of the three major types, silent thyroiditis is characterized by rigidity and slight enlargement of the thyroid gland. Postpartum thyroiditis, a form of silent thyroiditis, develops in 5–9% of all women who have recently given birth. Postpartum thyroiditis develops within a year of the baby's birth and disappears within six months.

Acute thyroiditis

Caused by acute infection, this rare disease is a medical emergency. A patient who has acute thyroiditis has a high **fever** and feels very ill. The neck is red, hot, and very tender.

Causes and symptoms

Hashimoto's disease

Hashimoto's disease develops when the immune system attacks the thyroid gland. It may be related to such hormone-related (endocrine system) disorders as:

- Addison's disease. This condition, caused by malfunction of the adrenal gland, is characterized by weakness, loss of weight and appetite, and increased sensitivity to cold.
- Diabetes mellitus. This metabolic disorder is caused by a lack of insulin production or by the body's inability to process insulin.
- Graves' disease. This disease is the most common form of **hyperthyroidism**.
- Vitiligo. This is a noncancerous skin disease characterized by unpigmented patches of skin.

Being female and having a family history of Hashimoto's thyroiditis increases the likelihood of developing the disease. Its symptoms include:

- constipation
- fatigue
- goiter or enlarged neck
- inability to tolerate cold temperatures
- weight gain, some patients' faces swell and their joints stiffen.

Subacute thyroiditis

Characterized by painful gland enlargement that is sometimes mistaken for a **sore throat** that may last for months, subacute thyroiditis often follows:

- influenza
- mumps
- upper respiratory infections
- viruses that produce cold symptoms and inflammation of the membrane that protects the brain (**meningitis**), inflammation of the sac that surrounds the heart (**pericarditis**), inflammation of the heart muscle (**myocarditis**), and other diseases

People who have subacute thyroiditis feel feverish, weak, and tired. The thyroid is sore to the touch. They may be nervous, sweat, and have trouble tolerating heat or swallowing. Symptoms of subacute thyroiditis also include:

- rapid heartbeat
- tremors
- weight loss

Silent thyroiditis

The cause of silent thyroiditis is uncertain, but the condition is believed to be an immune-system disorder triggered by **childbirth**. Although silent thyroiditis is painless, the condition's other symptoms are similar to those of subacute thyroiditis. The thyroid gland enlarges only slightly, and the eyes do not bulge.

Diagnosis

Family physicians and endocrinologists usually base a diagnosis of thyroiditis on:

- blood levels of **thyroid hormones**, thyroid-stimulating hormone, and anti-thyroid antibodies
- personal and family medical history
- the appearance of a patient's thyroid gland

Thyroid antibodies present in 95% of patients with Hashimoto's thyroiditis make it possible to diagnose this disease without surgery or biopsy. A blood test that measures sedimentation rate, an indication of the extent of inflammation, is a useful tool for diagnosing subacute thyroiditis.

Treatment

Medical therapy for thyroiditis includes:

- **antibiotics** to fight infection
- high doses of **aspirin** to relieve inflammation
- hormones to suppress or replace thyroid function
- pain medications

Cortisone drugs are sometimes prescribed to reduce persistent inflammation. In rare instances, surgery can be

used to drain infection or relieve pressure near the thyroid gland.

Hashimoto's disease

The goal of treatment for Hashimoto's disease is to prevent the thyroid gland from getting larger. Regular monitoring may be the only treatment indicated for patients whose gland is only slightly enlarged, and who show no signs of hormone deficiency. Levothyroxine (Synthroid) may be prescribed to correct hormone deficiency in a patient who has a large goiter.

Subacute thyroiditis

The goal of treatment for subacute thyroiditis is to relieve pain, reduce inflammation, and regulate hyperthyroidism. Bed rest and **beta blockers** (propranolol, nadolol) may be necessary until thyroid activity is controlled, and the patient may have to take:

- anti-inflammatory medication for several weeks
- high doses of aspirin
- other **analgesics**

If subacute thyroiditis continues for a long time, cortisone and thyroid hormone medication may be prescribed to relieve inflammation and allow the gland to rest. Glucocorticoids (prednisone) are prescribed for symptoms that do not respond to other treatment. The original problem often becomes more pronounced after these medications are discontinued.

Silent thyroiditis

Most patients who have silent thyroiditis don't need any treatment, but:

- bed rest and beta blockers are occasionally needed to regulate rapid heart beat
- inderal (propanolol) may be prescribed for brief periods of hyperthyroidism
- steroids may be prescribed for severe episodes of acute inflammation

Acute thyroiditis

Acute thyroiditis requires emergency treatment with antibiotics and surgery.

Prognosis

Thyroiditis usually responds to treatment, and some patients recover normal thyroid function without treatment. Because permanent loss of thyroid function is a possibility and life-long thyroid replacement therapy

may be necessary, regular medical monitoring should continue even after the patient has apparently recovered.

Hashimoto's disease

Some cases of Hashimoto's disease remain stable for years. Others slowly progress to hypothyroidism, which is treated with thyroid **hormone replacement therapy**.

Subacute thyroiditis

Most patients with subacute thyroiditis recover fully after no more than a few months. This condition occasionally recurs, but severe or long-term complications are rare.

Silent thyroiditis

Four of every five patients with silent thyroiditis recover completely within three months. The thyroid status of these patients should be evaluated within 12 months. Because silent thyroiditis recurs in 10% of patients within three years and may progress to hypothyroidism, medical monitoring should continue for three years after recovery appears complete.

Prevention

Flu shots or immunizations for **measles**, mumps, and **rubella** may help prevent conditions associated with subacute thyroiditis. There is no known way to prevent other forms of thyroiditis.

Resources

ORGANIZATIONS

The Thyroid Foundation of America. 350 Ruth Sleeper Hall, Parkman St., Boston, MA 02114. (800) 232-8321. <<http://www.clark.net/pub/tfa>>.

The Thyroid Society for Education and Research. 7515 South Main St., Suite 545, Houston, TX 77030. (800) 849-7643. <<http://the-thyroid-society.org/thyroid.html>>.

OTHER

"Chronic Thyroiditis (Hashimoto's disease)." *Health Answers.com* 30 Apr. 1998 <<http://www.healthanswers.com>>.

"How do Doctors Test for Thyroiditis?" *The Thyroid Society Page*. 20 Apr. 1998 <<http://the-thyroid-society.org>>.

"Silent Thyroiditis." *The Merck Page*. 22 Apr. 1998 <<http://www.merck.com>>.

"Subacute Thyroiditis." *The Merck Page*. 22 Apr. 1998 <<http://www.merck.com>>.

"Subacute Thyroiditis." *HealthAnswers.com* 30 Apr. 1998 <<http://healthanswers.com>>.

"Thyroiditis." *ThriveOnline*. 21 Apr. 1998 <<http://thriveonline.oxygen.com>>.

KEY TERMS

Addison's disease—A disease that results from a deficiency in adrenocortical hormones.

Diabetes mellitus—A disorder of the pancreas. This chronic disorder of carbohydrate metabolism results in hyperglycemia and glycosuria.

Goiter—An abnormal enlargement of the thyroid gland.

Graves' disease—Also called hyperthyroidism, this disease results from overactivity of the thyroid gland.

Subacute—An abnormal condition present in a person who appears to be clinically well.

Vitiligo—A benign skin disease that results in irregular patches of skin that are totally lacking in color.

"What are the Main Types of Thyroiditis?" *The Thyroid Society Page*. 20 Apr. 1998 <<http://the-thyroid-society.org>>.

"What is Thyroiditis?" *The Thyroid Society Page*. 20 Apr. 1998 <<http://the-thyroid-society.org>>.

"Your Thyroid." *Endocrine Web Page*. 22 Apr. 1998 <<http://www.endocrineweb.com>>.

Maureen Haggerty

Thyrotoxicosis see **Hyperthyroidism**

Thyroxine-binding globulin test see **Thyroid function tests**

Thyroxine test see **Thyroid function tests**

TIA see **Transient ischemic attack**

Tic douloureux see **Trigeminal neuralgia**

Tick fever see **Relapsing fever**

Tilt table test

Definition

The tilt table test is a test in which a patient is positioned in a supine position and brought to a predetermined angle or angles from the horizontal position. Such positioning helps to determine the cause of any decrease in oxygen to the brain. Different types of drugs may also be used in the testing process.

Purpose

The purpose of the tilt table test is to help determine appropriate therapy for individuals with **fainting** (syncope) and presyncope of unexplained origin.

Precautions

Precautions are few with the tilt table test. However, when any drug is used with this test, the appropriate precautions for that particular drug should be observed. For example, when isoproterenol or similar drugs are used during the tilt table test, the taking of non-prescription drugs for **asthma**, **cough**, cold, or allergy; appetite suppressants; sleeping pills; or drugs containing **caffeine** should be made known to the physician prior to the test. Likewise, the physician should be informed of any **allergies** to any sympathomimetic drugs, including several of the diet pills on the market. The physician should be told of any serious heart-rhythm disorders.

Description

Syncope is described as a pathological brief loss of consciousness caused by a temporary deficiency of oxygen in the brain. Previous studies have shown the effectiveness of tilt table testing in establishing the diagnosis of neurocardiogenic syncope, and in dictating therapy in patients with syncope of unknown origin. Despite its usefulness, small numbers of patients and brief followup reports have limited the majority of studies. Sensitivity-enhancing techniques, such as the administration of isoproterenol, are applied in specific cases to children and young adults to compensate for the otherwise low sensitivity (20-30%) observed in that population.

Preparation

In order for a patient to make informed decisions about any diagnostic test or procedure, there are important questions that need to be asked prior to the procedure. The information gained will be helpful for that patient in determining benefits, risks, and cost of the procedure, and alternatives. The patient should understand the purpose of the tilt table test, and the diagnosis that the physician is trying to confirm or rule out. If the tilt table test is positive, the patient should ask questions about the frequency of false-positive results for that particular tilt table procedure, and should inquire about the next step in treatment.

Aftercare

After the procedure, the patient is asked to transfer from the supine position to a sitting position, and is observed for a short period of time. During this time and

KEY TERMS

Sympathomimetic—Denoting a drug that mimics the effects of stimulation of organs and structures by the sympathetic nervous system. The sympathetic nervous system pertains to the part of the nervous system originating in the thoracic and lumbar regions of the spinal cord. In general, it inhibits or opposes the physiological effects of another aspect of the nervous system, as in tending to reduce digestive secretions, speed up the heart, and contract the blood vessels.

Syncope—A loss of consciousness over a short period of time, caused by a temporary lack of oxygen in the brain.

Vertigo—The sensation of dizziness.

after several minutes in the sitting position, any symptoms of **dizziness** and vertigo are noted. When ready, the individual transfers from the sitting position to standing. After additional observation and taking of vital signs, the individual is allowed to go home.

Risks

Risks of the tilt table test are low, but do include significant changes in blood pressure while in the supine position, and any adverse reactions to any drugs administered during the tilt table test.

Normal results

Normal results of the tilt table test should help the physician in assessing what may or may not be the cause of the syncope.

Abnormal results

Abnormal results include any pathologic reactions to the position changes or sensitivity enhancing techniques, such as the administration of isoproterenol or other related drugs.

Resources

PERIODICALS

Tonnessen, G. E., et. al. "The Value of Tilt Table Testing with Isoproterenol in Determining Therapy in Adults with Syncope and Presyncope of Unexplained Origin." *Archives of Internal Medicine* 154, no. 14 (25 July 1994): 1613-7.

ORGANIZATIONS

American Medical Association. 515 N. State St., Chicago, IL 60612. (312) 464-5000. <<http://www.ama-assn.org>>.

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Tinea pedis see **Athlete's foot**

Tinea cruris see **Ringworm**

Tingling see **Numbness and tingling**

Tinnitus

Definition

Tinnitus is hearing ringing, buzzing, or other sounds without an external cause. Patients may experience tinnitus in one or both ears or in the head.

Description

Tinnitus affects as many as 40 million adults in the United States. It is defined as either objective or subjective. In objective tinnitus, the doctor can hear the sounds, as well as the patient. Objective tinnitus is typically caused by tumors, turbulent blood flow through malformed vessels, or by rhythmic muscular spasms. Most cases of tinnitus are subjective, which means that only the patient can hear the sounds.

Causes and symptoms

Subjective tinnitus is frequently associated with **hearing loss**. About 90% of patients have sensorineural hearing loss; 5% suffer from conductive hearing loss; 5% have normal hearing. The causes of subjective tinnitus include:

- impacted ear wax
- ear infections
- hardening of the structures of the inner ear
- hearing loss related to age or excessive noise
- ototoxic medications, including **aspirin**, quinine, some **diuretics**, heavy metals, alcohol, and certain antibiotics
- meniere's syndrome
- head trauma
- systemic diseases, including **syphilis**, **hypertension**, **anemia**, or **hypothyroidism**
- tumors of the ear

Diagnosis

Diagnosis of tinnitus includes a physical examination of the patient's head and neck. The doctor will use an otoscope to examine the ears for wax, infection, or structural changes. He or she will also use a stethoscope to listen to the blood vessels in the neck. Additional tests may include the following:

Tuning fork tests

The Rinne and Weber tests are commonly used to evaluate the type and severity of hearing loss. In the Weber test, the doctor holds a tuning fork against the patient's forehead or front teeth. If the hearing loss is sensorineural, the sound radiates to the ear with better hearing; if the hearing loss is conductive, the sound will be louder in the damaged ear. In the Rinne test, the tuning fork is placed alternately on the mastoid bone (behind the ear) and in front of the ear. In conductive hearing loss, bone conduction (BC) is greater than air conduction (AC). In sensorineural hearing loss, AC is greater than BC.

Diagnostic imaging

Magnetic resonance angiography or venography (MRA and MRV) can be used to evaluate malformations of the blood vessels. Computed tomography scans (CT scans) or magnetic resonance imaging scans (MRIs) can be used to locate tumors or abnormalities of the brain stem.

Blood tests

The doctor may order a complete blood count (CBC) with specific antibody tests to rule out syphilis or immune system disorders.

Treatment

Some cases of tinnitus can be treated by removal of the underlying cause. These include surgical treatment of impacted ear wax, tumors, head injuries, or malformed blood vessels; discontinuance of ototoxic medications; and antibiotic treatment of infections.

Subjective tinnitus, especially that associated with age-related hearing loss, can be treated with hearing aids, noise generators or other masking devices, biofeedback, antidepressant medications, or lifestyle modifications (elimination of smoking, coffee, and aspirin).

Alternative treatment

A variety of alternative therapies may be helpful in the treatment of tinnitus. Dietary adjustments, including

KEY TERMS

Conductive hearing loss—Hearing loss caused by loss of function in the external or middle ear.

Ménière's syndrome—A disease of the inner ear, marked by recurrent episodes of loss of balance (vertigo) and roaring in the ears lasting several hours. Its cause is unknown.

Ototoxic—Damaging to the nerves controlling the senses of hearing and balance.

Sensorineural hearing loss—Hearing loss caused by damage to the nerves or parts of the inner ear governing the sense of hearing.

the elimination of coffee and other stimulants, may be useful, since stimulants can make tinnitus worse. In addition, reducing the amount of fat and cholesterol in the diet can help improve blood circulation to the ears. Nutritional supplementation with vitamin C, vitamin E, B vitamins, calcium, magnesium, potassium, and essential fatty acids is also recommended. Gingko (*Gingko biloba*) is often suggested, since it is believed to enhance circulation to the brain. Acupuncture treatments may help decrease the level of tinnitus sounds the patient hears, and constitutional homeopathic treatment may also be effective.

Prognosis

The prognosis depends on the cause of the tinnitus and the patient's emotional response. Most patients with subjective tinnitus do not find it seriously disturbing, but about 5% have strong negative feelings. These patients are frequently helped by instruction in relaxation techniques.

Resources

BOOKS

House, John W. "Tinnitus." In *Conn's Current Therapy*, 1996, ed. Robert E. Rakel. Philadelphia: W. B. Saunders Co., 1996.

Jackler, Robert K., and Michael J. Kaplan. "Ear, Nose, & Throat." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

"Otolaryngology: Tinnitus." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

Rowe, Lee D. "Otolaryngology—Head & Neck Surgery." In *Current Surgical Diagnosis and Treatment*. 10th ed. Ed. Lawrence W. Way. Stamford: Appleton & Lange, 1994.

Rebecca J. Frey, PhD

Tissue compatibility see **Tissue typing**
 Tissue plasminogen activator see
Thrombolytic therapy

Tissue typing

Definition

Tissue typing is a group of procedures that determines the type of histocompatibility antigens on a person's cells or tissues. This procedure is typically used prior to transplantation of tissues or organs.

Purpose

Tissue typing is done prior to transplantation to ensure as close a match as possible between the donor and the recipient. If the histocompatibility antigens do not match well, there is a much greater chance that the recipient will reject the donated tissue.

Histocompatibility antigens are molecules on the surface of all cells in the body. The specific types of histocompatibility antigens present on a person's cells determine their identity and distinguish each person. They are a "fingerprint."

Each person has a unique set of histocompatibility antigens. If the antigens on tissue or organs from a donor do not match that of the recipient, a rejection response can occur. The recipient's immune system will detect the difference between the two sets of antigen and start a rejection response to kill the donated tissue. Except in the case of identical twins, no two people are identical in terms of their histocompatibility antigen types. However, the closer two tissues come to matching, the more likely the recipient will accept the donated tissue or organ.

Human Lymphocyte Antigens (HLA) is the name given to the most commonly used histocompatibility antigens. The antigens can be grouped into two classes: class I antigens are found on almost all cells, and class II antigens are normally found only on B lymphocytes, macrophages, monocytes, dendritic cells, and endothelial cells.

Description

Generally, typing is performed on blood cells because they are an easy sample to obtain. Blood is withdrawn from a vein in the forearm, and the cells are separated. There are a number of different techniques used to identify the antigens on the cells. Typically, specific antibodies react with the cells. Each antibody

KEY TERMS

Antibody—A molecule produced by the body that is part of the immune response to attack antigens.

Antigen—A molecule that causes the body to produce an immunological response to attack the antigen.

Cornea—The transparent outer layer of the eye. It covers the iris and lens.

Lymphocyte—A class of white blood cells that are responsible for creating the immune response to antigens.

preparation is specific for one histocompatibility antigen. If the antigen is present, the antibody will bind to it. Laboratory instruments are used to detect antibody binding to the cells. Class II antigens are determined by the mixed lymphocyte reaction (MLR) or by a polymerase chain reaction (PCR). In the mixed lymphocyte reaction, lymphocyte replication occurs if there is a mismatch, and is detected by a specific assay. The PCR test is a new DNA-based test that can detect the presence or absence of antigens by determining whether cells have the genes for the antigens.

One type of transplant does not require tissue typing. In the case of corneal transplants, tissue typing is not needed because corneas do not have their own blood supply. This greatly reduces the chance that immune cells will come in contact with the cornea and recognize it as foreign. For this reason, corneas can be transplanted from any person, and there is little chance of rejection.

Normal results

Because each person has their own histocompatibility antigen "fingerprint," there is no true normal result. Each fingerprint is unique.

Resources

BOOKS

Berkow, Robert, ed. *Merck Manual of Medical Information*.

Whitehouse Station, NJ: Merck Research Laboratories, 1997.

Beutler, E., et al., eds. *William's Hematology*. 5th ed. New York: McGraw-Hill, Inc. 1995.

Henry, J. B. *Clinical Diagnosis and Management by Laboratory Methods*. New York: W. B. Saunders Co., 1996.

John T. Lohr, PhD

TMJ see **Temporomandibular joint disorders**
 Tobramycin see **Aminoglycosides; Antibiotics, ophthalmic**
 Tocopherol deficiency see **Vitamin E deficiency**
 Toenail removal see **Nail removal**
 Tonsil removal see **Tonsillectomy and adenoidectomy**

KEY TERMS

Abscess—A localized area of tissue destruction and pus formation.

Adenoids—Masses of lymphoid tissue that are found in the upper throat.

Sleep apnea—A condition marked by loud snoring during sleep and periodic episodes of suspended breathing.

Tonsils—Oval masses of lymphoid tissue on each side of the throat.

Tonsillectomy and adenoidectomy

Definition

Tonsillectomy and adenoidectomy (T & A) are surgical procedures to remove the tonsils from the back of the mouth or adenoids from the back of the nasal cavity—both are part of the lymphatic system, which is responsible for fighting infection. These operations are often performed together and are usually done on children. T & As are the most common childhood operations.

Purpose

Tonsillectomy

Tonsils are removed (with or without the adenoids) when the child has any of the following conditions:

- obstruction of the upper airway.
- sleep apnea. This is a condition in which the child snores loudly and stops breathing temporarily at intervals during sleep.
- inability to swallow properly because of enlarged tonsils.
- “hot potato” voice (breathy voice) and other speech abnormalities due to enlarged tonsils
- recurrent or persistent abscesses or throat infections

Doctors do not agree completely on the number of sore throats that make a tonsillectomy necessary. Most would agree that four cases of **strep throat** in any one year; six or more episodes of **tonsillitis** in one year; or five or more episodes of tonsillitis per year for two years indicate that the tonsils should be removed.

Adenoidectomy

Adenoids are removed (with or without the tonsils) when the child has any of the following conditions:

- alteration of facial growth because of enlarged adenoids

- upper airway obstruction
- development of an irregular bite (dental malocclusion)
- difficult speech or swallowing

Precautions

T & As are not performed as frequently today as they were in the past. One reason for a more conservative approach is that there is always some risk involved when a patient is put under general anesthesia.

In some cases, a T & A may need to be modified or postponed:

- children with cleft palates should not have the adenoids removed
- bleeding disorders; these must be brought under control before surgery
- acute tonsillitis; surgery should be postponed—usually for three to four weeks—until the infection is gone

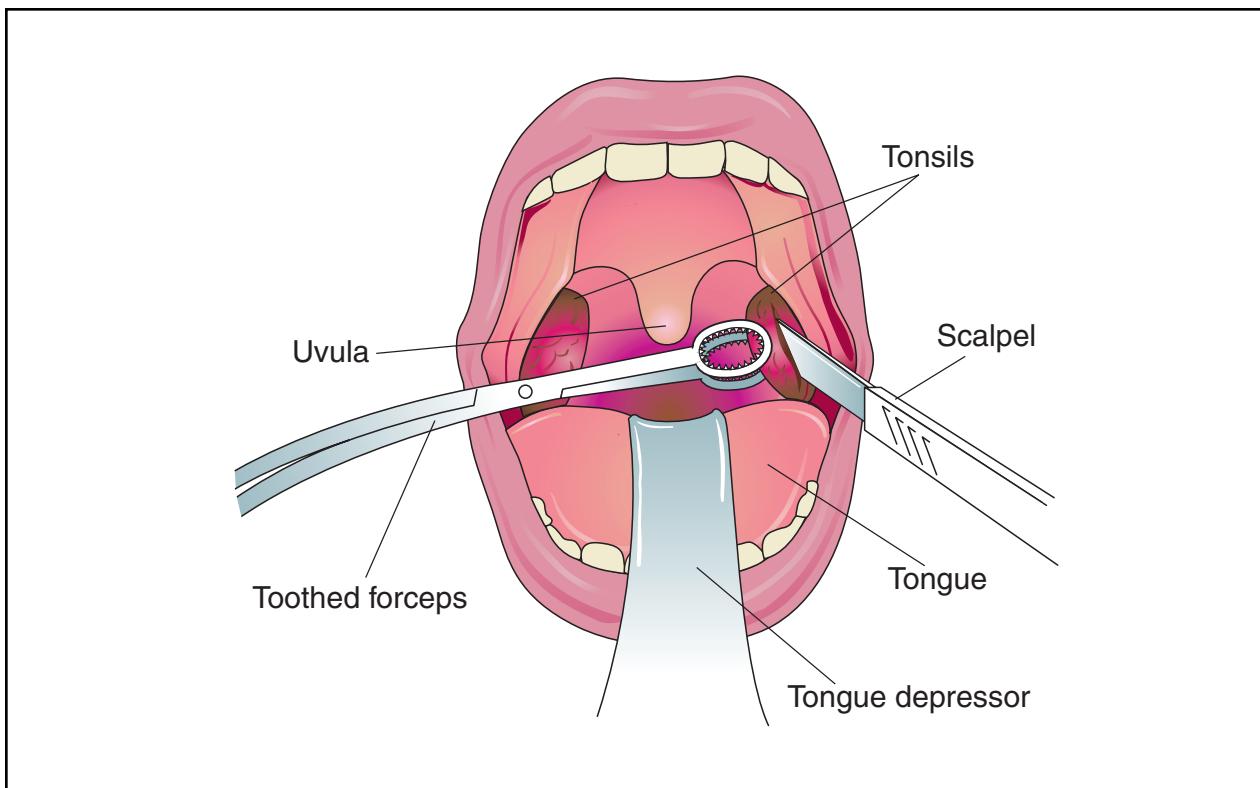
Description

Tonsillectomies are hospital procedures. In adults, they may be performed under local anesthesia. Children are usually placed under general anesthesia. The doctor depresses the tongue in order to see the throat and removes the tonsils with a scooplike instrument. The adenoids are usually removed through the nose.

Aftercare

Patients are turned on the side after the operation to prevent the possibility of blood being drawn into the lungs. The patient's vital signs are checked. After the patient is fully awake, he or she can drink water and other nonirritating liquids.

Adult patients are usually warned to expect some bleeding after the operation and a very **sore throat**.



Tonsillectomy and adenoidectomy are surgical procedures performed to remove the tonsils or adenoids. The tonsils are removed in cases where they are a source of recurrent infection or have developed an abscess. Both operations are typically performed on children. The illustration above shows a tonsillectomy in progress. (Illustration by Electronic Illustrators Group.)

Antibiotics are given to prevent infection. Medications to relieve **pain** may also be given. For at least the first 24 hours, the patient is fed soft or pureed foods and fluids. If the adenoids alone were removed, the patient may be allowed solid food the day after surgery.

Patients are usually sent home the next day, with instructions to call the doctor if there is bleeding, an earache, or a **fever** that lasts longer than three days. They are told to expect a white scab to form in the throat between five and 10 days after surgery.

Risks

About one in every fifteen thousand tonsillectomies ends in **death**, either from the anesthesia or from bleeding to death five to seven days after the operation. There is also a chance that children with previously normal speech will develop a nasal-sounding voice. In addition, children younger than five years may be badly emotionally upset by the hospital experience.

Normal results

Normal results include the correction of the condition for which the surgery was performed.

Resources

BOOKS

- Berman, Stephen, and Ken Chan. "Ear, Nose, & Throat." In *Current Pediatric Diagnosis & Treatment*, ed. William W. Hay Jr., et al. Stamford: Appleton & Lange, 1997.
- Markel, Howard, and Frank A. Oski. *The Practical Pediatrician: The A to Z Guide to Your Child's Health, Behavior, and Safety*. New York: W. H. Freeman and Co., 1995.
- "Tonsillitis." In *Professional Guide to Diseases*, ed. Stanley Loeb, et al. Springhouse, PA: Springhouse Corporation, 1991.

Rebecca J. Frey, PhD

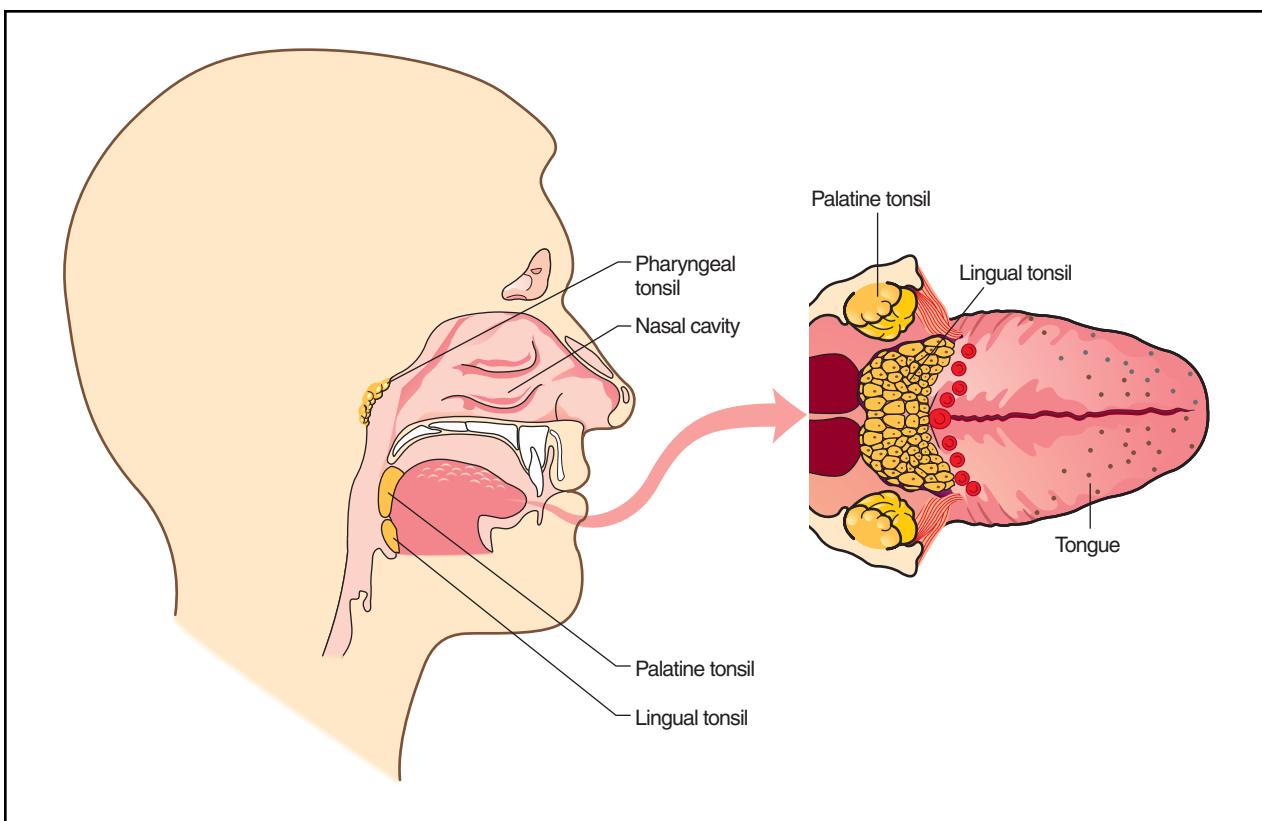
Tonsillitis

Definition

Tonsillitis is an infection and swelling of the tonsils, which are oval-shaped masses of lymph gland tissue located on both sides of the back of the throat.

Description

The tonsils normally help to prevent infections. They act like filters to trap bacteria and viruses entering



The palatine, lingual, and pharyngeal tonsils. (Illustration by Hans & Cassady, Inc.)

the body through the mouth and sinuses. The tonsils also stimulate the immune system to produce antibodies to help fight off infections. Anyone of any age can have tonsillitis; however, it is most common in children between the ages of five and 10 years.

Causes and symptoms

Tonsillitis is caused by viruses or bacteria that cause the tonsils to swell and become inflamed. A mild or severe **sore throat** is one of the first symptoms of tonsillitis. Symptoms can also include **fever**, chills, tiredness, muscle aches, earache, **pain** or discomfort when swallowing, and swollen glands in the neck. Very young children may be fussy and stop eating. When a doctor or nurse looks into the mouth with a flashlight, the tonsils may appear swollen and red. Sometimes, the tonsils will have white or yellow spots or flecks or a thin coating. Symptoms usually last four to six days.

Diagnosis

The diagnosis of tonsillitis is made from the visible symptoms and a **physical examination** of the patient. The doctor will examine the eyes, ears, nose, and throat, looking at the tonsils for signs of swelling, redness, or a

discharge. A careful examination of the throat is necessary to rule out **diphtheria** and other conditions that may cause a sore throat. Since most sore throats in children are caused by viruses rather than bacteria, the doctor may take a **throat culture** in order to test for the presence of streptococcal bacteria. A throat culture is performed by wiping a cotton swab across the tonsils and back of the throat, and sending the swab to a laboratory for culturing. *Streptococcus pyogenes*, the bacterium that causes **strep throat**, is the most common disease agent responsible for tonsillitis. Depending on what type of test is used for strep, the doctor may be able to determine within a few minutes if *S. pyogenes* is present. The quick tests for strep are not as reliable as a laboratory culture, which can take 24–48 hours. If the results of a quick test are positive, however, the doctor can prescribe **antibiotics** right away. If the quick test results are negative, the doctor can do a throat culture to verify the results and wait for the laboratory report before prescribing antibiotics. A blood test may also be done to rule out a more serious infection or condition, and to check the white blood cell count to see if the body is responding to the infection. In some cases, the doctor may order blood tests for mononucleosis, since about a third of patients with mononucleosis develop **streptococcal infections** of the tonsils.



An examination of this patient's mouth reveals acute tonsillitis. (Custom Medical Stock Photo. Reproduced by permission.)

Treatment

Treatment of tonsillitis usually involves keeping the patient comfortable while the illness runs its course. This supportive care includes bed rest, drinking extra fluids, gargling with warm salt water, and taking pain relievers—usually NSAIDs—to reduce fever. Frozen juice bars and cold fruit drinks can bring some temporary relief of sore throat pain; drinking warm tea or broth can be soothing. If the throat culture shows that *S. pyogenes* is present, penicillin or other antibiotics will be prescribed. An injection of benzathine or procaine penicillin may be most effective in treating the infection, but it is also painful. If an oral antibiotic is prescribed, it must be taken for the full course of treatment, usually 10–14 days. If the patient has several episodes of severe tonsillitis, the doctor may recommend a tonsillectomy, which is the surgical removal of the tonsils.

Alternative treatment

Strengthening the immune system is important whether tonsillitis is caused by bacteria or viruses. Naturopaths often recommend dietary supplements of vitamin C, bioflavonoids, and beta-carotenes—found naturally in fruits and vegetables—to ease inflammation and fight infection. A variety of herbal remedies also may be helpful in treating tonsillitis. Calendula (*Calendula officinalis*) and cleavers (*Galium aparine*) target the lymphatic system, while *echinacea* (*Echinacea spp.*) and astragalus (*Astragalus membranaceus*) stimulate the immune system. Goldenseal (*Hydrastis canadensis*), myrrh (*Commiphora molmol*), and bitter orange act as antibacterials. *Lomatium dissectum* and *Ligusticum porteri* have an antiviral action. Some of the homeopathic medicines that may be used to treat symptoms of tonsillitis include *Belladonna*, *Phytolacca*, *Mercurius*,

Lycopodium, *Lachesis*, *Hepar sulphuris*, *Arsenicum*, or *Rhus toxicodendron*. As with any condition, the treatment and dosage should be appropriate for the particular symptoms and age of the patient.

Prognosis

Tonsillitis usually resolves within a few days with rest and supportive care. Treating the symptoms of sore throat and fever will make the patient more comfortable. If fever persists for more than 48 hours, however, or is higher than 102°F, the patient should be seen by a doctor. If antibiotics are prescribed to treat an infection, they should be taken as directed for the complete course of treatment, even if the patient starts to feel better in a few days. Prolonged symptoms may indicate that the patient has other upper respiratory infections, most commonly in the ears or sinuses. An **abscess** behind the tonsil (a peritonsillar abscess) may also occur. In rare cases, a persistent sore throat may point to more serious conditions, such as **rheumatic fever** or **pneumonia**.

Prevention

The bacteria and viruses that cause tonsillitis are easily spread from person to person. It is not unusual for an entire family or several students in the same classroom to come down with similar symptoms, especially if *S. pyogenes* is the cause. The risk of transmission can be lowered by avoiding exposure to anyone who already has tonsillitis or a sore throat. Drinking glasses and eating utensils should not be shared and should be washed in hot, soapy water before reuse. Old toothbrushes should be replaced to prevent reinfection. People who are caring for someone with tonsillitis should wash their hands frequently, to prevent spreading the infection to others.

Resources

BOOKS

- “Ear, Nose, and Throat Disorders: Tonsillitis.” In *Diseases*, ed. Margaret Eckman and Nancy Priff. Springhouse, PA: Springhouse Corporation, 1997.
- “Pharyngitis & Tonsillitis.” In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.
- “Tonsillitis.” In *The Consumer’s Medical Desk Reference*, ed. Charles B. Inlander and the staff of the People’s Medical Society. New York: A Stonesong Press Book, 1995.
- Shaw, Michael, ed. *Everything You Need to Know About Diseases*. Springhouse, PA: Springhouse Corporation, 1996.
- “Tonsillitis.” In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.
- “Tonsillitis.” In *Professional Guide to Diseases*. 5th ed. Springhouse, PA: Springhouse Corporation, 1995.

KEY TERMS

Streptococcus pyogenes—A common bacterium that causes strep throat and can also cause tonsillitis.

Tonsillectomy—A surgical procedure to remove the tonsils if the patient has recurrent sore throats or throat infections, or if the tonsils have become so swollen that the patient has trouble breathing or swallowing.

Tonsils—Oval-shaped masses of glandular tissue located on both sides at the back of the throat. Tonsils act like filters to trap bacteria and viruses.

PERIODICALS

Sataloff, Robert Thayer. "Treating Common Disorders of the Voice." *Hospital Medicine* 33 (1997): 47-60.

OTHER

"Tonsillitis." *Kids Health Page*. <<http://KidsHealth.org/parent/common/tonsillitis.html>>.

Altha Roberts Edgren

Tooth decay

Definition

Tooth decay, which is also called dental cavities or dental caries, is the destruction of the outer surface (enamel) of a tooth. Decay results from the action of bacteria that live in plaque, which is a sticky, whitish film formed by a protein in saliva (mucin) and sugary substances in the mouth. The plaque bacteria sticking to tooth enamel use the sugar and starch from food particles in the mouth to produce acid.

Description

Tooth decay is a common health problem, second in prevalence only to the **common cold**. It has been estimated that 90% of people in the United States have at least one cavity and that 75% of people had their first cavity by the age of five. Although anyone can have a problem with tooth decay, children and senior citizens are the two groups at highest risk. Other high-risk groups include people who eat a lot of starchy and sugary foods; people living in areas without a fluoridated water supply; and people who already have numerous dental restorations (fillings and crowns).

Baby bottle tooth decay

Baby bottle tooth decay is a dental problem that frequently develops in infants that are put to bed with a bottle containing a sweet liquid. Baby bottle tooth decay is also called nursing-bottle caries and bottle-mouth syndrome. Bottles containing such liquids as milk, formula, fruit juices, sweetened drink mixes, and sugar water continuously bathe an infant's mouth with sugar during naps or at night. The bacteria in the mouth use this sugar to produce acid that destroys the child's teeth. The upper front teeth are typically the ones most severely damaged; the lower front teeth receive some protection from the tongue. Pacifiers dipped in sugar, honey, corn syrup, or other sweetened liquid also contribute to bottle-mouth syndrome. The first signs of damage are chalky white spots or lines across the teeth. As decay progresses, the damage to the child's teeth becomes obvious.

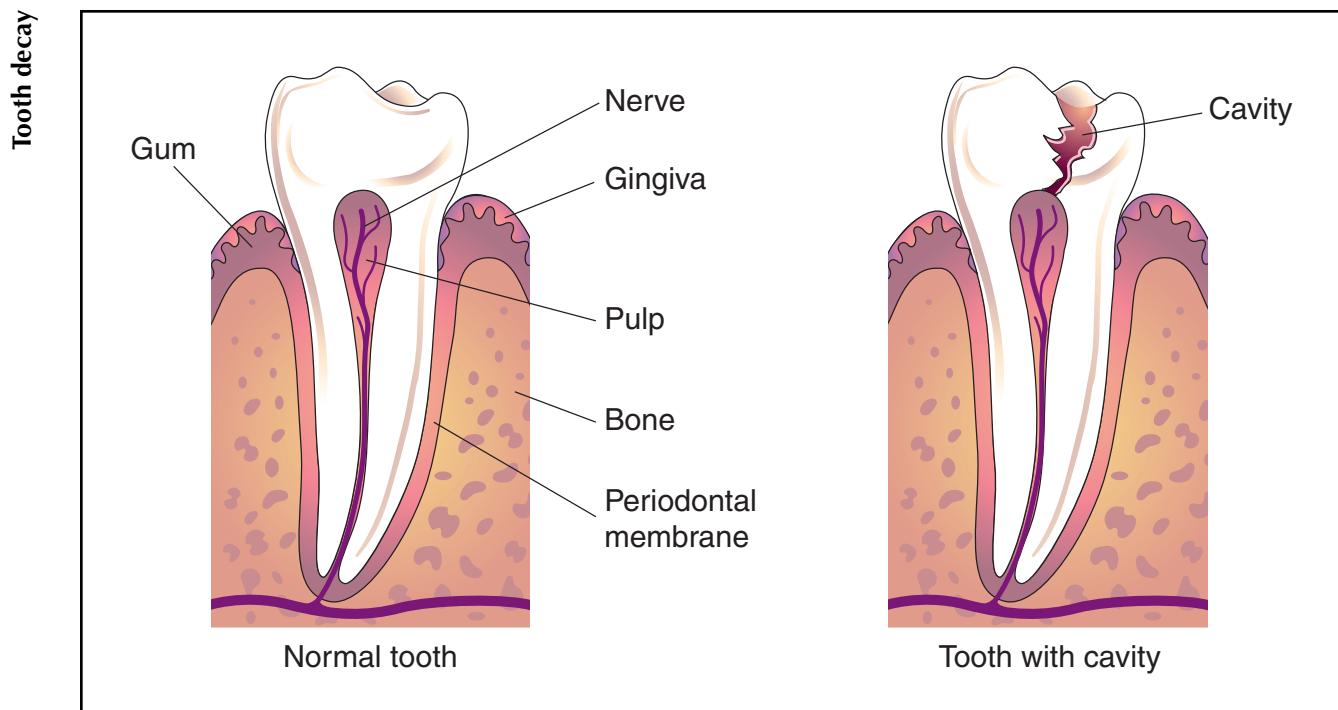
Causes and symptoms

Tooth decay requires the simultaneous presence of three factors: plaque bacteria, sugar, and a vulnerable tooth surface. Although several microorganisms found in the mouth can cause tooth decay, the primary disease agent appears to be *Streptococcus mutans*. The sugars used by the bacteria are simple sugars such as glucose, sucrose, and lactose. They are converted primarily into lactic acid. When this acid builds up on an unprotected tooth surface, it dissolves the **minerals** in the enamel, creating holes and weak spots (cavities). As the decay spreads inward into the middle layer (the dentin), the tooth becomes more sensitive to temperature and touch. When the decay reaches the center of the tooth (the pulp), the resulting inflammation (pulpitis) produces a **toothache**.

Diagnosis

Tooth decay develops at varying rates. It may be found during a routine six-month dental checkup before the patient is even aware of a problem. In other cases, the patient may experience common early symptoms, such as sensitivity to hot and cold liquids or localized discomfort after eating very sweet foods. The dentist or dental hygienist may suspect tooth decay if a dark spot or a pit is seen during a visual examination. Front teeth may be inspected for decay by shining a light from behind the tooth. This method is called transillumination. Areas of decay, especially between the teeth, will appear as noticeable shadows when teeth are transilluminated. X rays may be taken to confirm the presence and extent of the decay. The dentist then makes the final clinical diagnosis by probing the enamel with a sharp instrument.

Tooth decay in pits and fissures may be differentiated from dark shadows in the crevices of the chewing sur-



Tooth decay is the destruction of the outer surface, or enamel, of a tooth. It is caused by acid buildup from plaque bacteria, which dissolves the minerals in the enamel and creates cavities. (Illustration by Electronic Illustrators Group.)

faces by a dye that selectively stains parts of the tooth that have lost mineral content. A dentist can also use this dye to tell whether all tooth decay has been removed from a cavity before placing a filling.

Diagnosis in children

Damage caused by baby bottle tooth decay is often not diagnosed until the child has a severe problem, because parents seldom bring infants and toddlers in for dental check-ups. Dentists want to initially examine primary teeth between 12 and 24 months. Children still drinking from a bottle anytime after their first birthday are likely to have tooth decay.

Treatment

To treat most cases of tooth decay in adults, the dentist removes all decayed tooth structure, shapes the sides of the cavity, and fills the cavity with an appropriate material, such as silver amalgam or composite resin. The filling is put in to restore and protect the tooth. If decay has attacked the pulp, the dentist or a specialist called an endodontist may perform **root canal treatment** and cover the tooth with a crown.

In cases of baby bottle tooth decay, the dentist must assess the extent of the damage before deciding on the

treatment method. If the problem is caught early, the teeth involved can be treated with fluoride, followed by changes in the infant's feeding habits and better **oral hygiene**. Primary teeth with obvious decay in the enamel that has not yet progressed to the pulp need to be protected with stainless steel crowns. Fillings are not usually an option in small children because of the small size of their teeth and the concern of recurrent decay. When the decay has advanced to the pulp, pulling the tooth is often the treatment of choice. Unfortunately, loss of primary teeth at this age may hinder the young child's ability to eat and speak. It may also have bad effects on the alignment and spacing of the permanent teeth when they come in.

Prognosis

With timely diagnosis and treatment, the progression of tooth decay can be stopped without extended **pain**. If the pulp of the tooth is infected, the infection may be treated with **antibiotics** prior to root canal treatment or extraction. The longer decay goes untreated, however, the more destructive it becomes and the longer and more intensive the necessary treatment will be. In addition, a patient with two or more areas of tooth decay is at increased risk of developing additional cavities in the future.

Prevention

It is easier and less expensive to prevent tooth decay than to treat it. The four major prevention strategies include: proper oral hygiene; fluoride; sealants; and attention to diet.

Oral hygiene

GENERAL CARE OF THE MOUTH. The best way to prevent tooth decay is to brush the teeth at least twice a day, preferably after every meal and snack, and floss daily. Cavities develop most easily in spaces that are hard to clean. These areas include surface grooves, spaces between teeth, and the area below the gum line. Effective brushing cleans each outer tooth surface, inner tooth surface, and the horizontal chewing surfaces of the back teeth, as well as the tongue. Flossing once a day also helps prevent gum disease by removing food particles and plaque at and below the gum line, as well as between teeth. Patients should visit their dentist every six months for oral examination and professional cleaning.

MOUTH CARE IN OLDER ADULTS. Older adults who have lost teeth or had them removed still need to maintain a clean mouth. Bridges and dentures must be kept clean to prevent gum disease. Dentures should be relined and adjusted by a dentist whenever necessary to maintain proper fit. These adjustments help to keep the gums from becoming red, swollen, and tender.

MOUTH CARE IN CHILDREN. Parents can easily prevent baby bottle tooth decay by not allowing a child to fall asleep with a bottle containing sweetened liquids. Bottles should be filled only with plain, unsweetened water. The child should be introduced to drinking from a cup around six months of age and weaned from bottles by twelve months. If an infant seems to need oral comfort between feedings, a pacifier specially designed for the mouth may be used. Pacifiers, however, should never be dipped in honey, corn syrup, or other sweet liquids. After the eruption of the first tooth, parents should begin routinely wiping the infant's teeth and gums with a moist piece of gauze or a soft cloth, especially right before bedtime. Parents may begin brushing a child's teeth with a small, soft toothbrush at about two years of age, when most of the primary teeth have come in. They should apply only a very small amount (the size of a pea) of toothpaste containing fluoride. Too much fluoride may cause spotting (fluorosis) of the tooth enamel. As the child grows, he or she will learn to handle the toothbrush, but parents should control the application of toothpaste and do the followup brushing until the child is about seven years old.

Fluoride application

Fluoride is a natural substance that slows the destruction of enamel and helps to repair minor tooth

decay damage by remineralizing tooth structure. Toothpaste, mouthwash, fluoridated public drinking water, and vitamin supplements are all possible sources of fluoride. Children living in areas without fluoridated water should receive 0.5 mg/day of fluoride (0.25 mg/day if using a toothpaste containing fluoride) from three to five years of age, and 1 mg/day from six to 12 years.

While fluoride is important for protecting children's developing teeth, it is also of benefit to older adults with receding gums. It helps to protect their newly exposed tooth surfaces from decay. Older adults can be treated by a dentist with a fluoride solution that is painted onto selected portions of the teeth or poured into a fitted tray and held against all the teeth.

Sealants

Because fluoride is most beneficial on the smooth surfaces of teeth, sealants were developed to protect the irregular surfaces of teeth. A sealant is a thin plastic coating that is painted over the grooves of chewing surfaces to prevent food and plaque from being trapped there. Sealant treatment is painless because no part of the tooth is removed, although the tooth surface is etched with acid so that the plastic will adhere to the rough surface. Sealants are usually clear or tooth-colored, making them less noticeable than silver fillings. They cost less than fillings and can last up to 10 years, although they should be checked for wear at every dental visit. Children should get sealants on their first permanent "6-year" molars, which come in between the ages of five and seven, and on the second permanent "12-year" molars, which come in between the ages of 11 and 14. Sealants should be applied to the teeth shortly after they erupt, before decay can set in. Although sealants have been used in the United States for about 25 years, one survey by the National Institute of Dental Research reported that fewer than 8% of American children have them.

Diet

The risk of tooth decay can be lowered by choosing foods wisely and eating less often. Foods high in sugar and starch, especially when eaten between meals, increase the risk of cavities. The bacteria in the mouth use sugar and starch to produce the acid that destroys the enamel. The damage increases with more frequent eating and longer periods of eating. For better dental health, people should eat a variety of foods, limit the number of snacks, avoid sticky and overly sweetened foods, and brush often after eating.

Drinking water is also beneficial for rinsing food particles from the mouth. Children can be taught to "swish and swallow" if they are unable to brush after lunch at school. Similarly, saliva stimulated during eating

KEY TERMS

Amalgam—A mixture (alloy) of silver and several other metals, used by dentists to make fillings for cavities.

Caries—The medical term for tooth decay.

Cavity—A hole or weak spot in the tooth surface caused by decay.

Dentin—The middle layer of a tooth, which makes up most of the tooth's mass.

Enamel—The hard, outermost surface of a tooth.

Fluoride—A chemical compound containing fluorine that is used to treat water or applied directly to teeth to prevent decay.

Mucin—A protein in saliva that combines with sugars in the mouth to form plaque.

Plaque—A thin, sticky, colorless film that forms on teeth. Plaque is composed of mucin, sugars from food, and bacteria that live in the plaque.

Pulp—The soft, innermost layer of a tooth containing blood vessels and nerves.

Sealant—A thin plastic substance that is painted over teeth as an anti-cavity measure to seal out food particles and acids produced by bacteria.

Transillumination—A technique of checking for tooth decay by shining a light behind the patient's teeth. Decayed areas show up as spots or shadows.

makes it more difficult for food and bacteria to stick to tooth surfaces. Saliva also appears to have a buffering effect on the acid produced by the plaque bacteria and to act as a remineralizing agent. Older patients should be made aware that some prescription medications may decrease salivary flow. Less saliva tends to increase the activity of plaque bacteria and encourage further tooth decay. Chewing sugarless gum increases salivation and thus helps to lower the risk of tooth decay.

Resources

BOOKS

"Dental Caries and Its Complications—Tooth Decay." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

ORGANIZATIONS

American Dental Association. 211 E. Chicago Ave., Chicago, IL 60611. (312) 440-2500. <<http://www.ada.org>>.

American Dental Hygienists' Association. 444 North Michigan Ave., Chicago, IL 60611. (800)847-6718.

National Institute of Dental Research. 31 Center Drive, MSC 2190, Building 31, Room 5B49, Bethesda, MD 20892-2190.

OTHER

Healthtouch Online Page. <<http://www.healthtouch.com>>.

Bethany Thivierge

Tooth extraction

Definition

Tooth extraction is the removal of a tooth from its socket in the bone.

Purpose

Extraction is performed for positional, structural, or economic reasons. Teeth are often removed because they are impacted. Teeth become impacted when they are prevented from growing into their normal position in the mouth by gum tissue, bone, or other teeth. Impaction is a common reason for the extraction of wisdom teeth. Extraction is the only known method that will prevent further problems. Teeth may also be extracted to make more room in the mouth prior to straightening the remaining teeth (orthodontic treatment), or because they are so badly positioned that straightening is impossible. Extraction may be used to remove teeth that are so badly decayed or broken that they cannot be restored. In addition, patients sometimes choose extraction as a less expensive alternative to filling or placing a crown on a severely decayed tooth.

Precautions

In some situations, tooth extractions may need to be postponed temporarily. These situations include:

- Infection that has progressed from the tooth into the bone. Infections may make anesthesia difficult. They can be treated with **antibiotics** before the tooth is extracted.
- The patient's use of drugs that thin the blood (anticoagulants). These medications include warfarin (Coumadin) and **aspirin**. The patient should stop using these medications for three days prior to extraction.
- Patients who have had any of the following procedures in the previous six months: **heart valve replacement**, open heart surgery, prosthetic **joint replacement**, or placement of a medical shunt. These patients may be given antibiotics to reduce the risk of bacterial infection.

KEY TERMS

Dry socket—A painful condition following tooth extraction in which a blood clot does not properly fill the empty socket. Dry socket leaves the underlying bone exposed to air and food.

Extraction site—The empty tooth socket following removal of the tooth.

Impacted tooth—A tooth that is growing against another tooth, bone, or soft tissue.

Luxate—To loosen or dislocate the tooth from the socket.

Nitrous oxide—A colorless, sweet-smelling gas used by dentists for mild anesthesia. It is sometimes called laughing gas because it makes some patients feel giddy or silly.

Oral surgeon—A dentist who specializes in surgical procedures of the mouth, including extractions.

Orthodontic treatment—The process of straightening teeth to correct their appearance and function.

Description

Tooth extraction can be performed with local anesthesia if the tooth is exposed and appears to be easily removable in one piece. An instrument called an elevator is used to loosen (luxate) the tooth, widen the space in the bone, and break the tiny elastic fibers that attach the tooth to the bone. Once the tooth is dislocated from the bone, it can be lifted and removed with forceps.

If the extraction is likely to be difficult, the dentist may refer the patient to an oral surgeon. Oral surgeons are specialists who are trained to give nitrous oxide, an intravenous sedative, or a general anesthetic to relieve **pain**. Extracting an **impacted tooth** or a tooth with curved roots typically requires cutting through gum tissue to expose the tooth. It may also require removing portions of bone to free the tooth. Some teeth must be cut and removed in sections. The extraction site may or may not require one or more stitches to close the cut (incision).

Preparation

Before an extraction, the dentist will take the patient's medical history, noting **allergies** and prescription medications. A dental history is also taken, with particular attention to previous extractions and reactions to anesthetics. The dentist may then prescribe antibiotics or



A close-up view inside a person's mouth following the extraction of the lower right molar. (Custom Medical Stock Photo. Reproduced by permission.)

recommend stopping certain medications prior to the extraction. The tooth is x-rayed to determine its full shape and position, especially if it is impacted.

If the patient is going to have deep anesthesia, he or she should wear loose clothing with sleeves that are easily rolled up to allow for an intravenous line. The patient should not eat or drink anything for at least six hours before the procedure. Arrangements should be made for a friend or relative to drive the patient home after the surgery.

Aftercare

An important aspect of aftercare is encouraging a clot to form at the extraction site. The patient should put pressure on the area by biting gently on a roll or wad of gauze for several hours after surgery. Once the clot is formed, it should not be disturbed. The patient should not rinse, spit, drink with a straw, or smoke for at least 24 hours after the extraction and preferably longer. Vigorous exercise should not be done for the first three to five days.

For the first two days after the procedure, the patient should drink liquids without using a straw, and eat soft foods. Any chewing must be done on the side away from the extraction site. Hard or sticky foods should be avoided. The mouth may be gently cleaned with a toothbrush, but the extraction area should not be scrubbed.

Wrapped ice packs can be applied to reduce facial swelling. Swelling is a normal part of the healing process. It is most noticeable in the first 48–72 hours. As the swelling subsides, the patient may experience muscle stiffness. Moist heat and gentle exercise will restore jaw movement. The dentist may prescribe medications to relieve the postoperative pain.

Risks

Potential complications of tooth extraction include postoperative infection, temporary numbness from nerve irritation, jaw fracture, and jaw joint pain. An additional complication is called dry socket. When a blood clot does not properly form in the empty tooth socket, the bone beneath the socket is painfully exposed to air and food, and the extraction site heals more slowly.

Normal results

After an extraction, the wound usually closes in about two weeks. It takes three to six months for the bone and soft tissue to be restructured. Complications such as infection or dry socket may prolong the healing time.

Resources

ORGANIZATIONS

American Association of Oral and Maxillofacial Surgeons.
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Bethany Thivierge

Tooth grinding see **Bruxism**

many people in the general population are afraid of dental work. Most dentists in present-day practice can help patients with this specific fear.

Description

Fillings

Fillings are restorations that are done to repair damage caused by **tooth decay** (dental caries). Tooth decay occurs when microorganisms in the mouth convert sugar from food to acid, which attacks the tooth. The acid forms cavities that start in the hard outer surface of the tooth (the enamel) and may extend inward to the pulp, which contains the tooth's nerves and blood vessels. Left untreated, tooth decay may lead to inflammation and infection that may cause **toothache** and perhaps more serious complications.

To stop the decay process, the dentist removes the decayed portion of the tooth using a high-speed drill or an air abrasion system, shapes the cavity walls, and replaces the tooth structure with a filling of silver amalgam, composite resin, or gold. The filling is placed in the cavity as a liquid or soft solid. It sets within a few minutes and continues to harden over the next several hours. Silver amalgam is commonly used to fill cavities on the biting surfaces of the back teeth, because it is strong enough to withstand the tremendous pressures exerted by grinding and chewing. Composite resin is typically used to fill cavities in front teeth and any other teeth that are visible when the patient smiles, because its color can be matched to the tooth surface. Gold as a filling material is far less common, but is being increasingly used. Although it is more expensive and less easily applied, it does not trigger the sensitivity reactions that some patients have to silver amalgam.

Inlays

An inlay resembles a filling in that it fills the space remaining after the decayed portion of a tooth has been removed. The difference is that an inlay is shaped outside the patient's mouth and then cemented into place. After the decay is removed and the cavity walls are shaped, the dentist makes a wax pattern of the space. A mold is cast from the wax pattern. An inlay, usually of gold, is made from this mold and sealed into the tooth with dental cement.

Crowns

The crown of a tooth is the portion that is covered by enamel. A restorative crown replaces this outer part to protect the tooth. This protection becomes necessary when a tooth cracks or has its entire structure weakened by decay. As with a filling or inlay, the dentist first removes the decayed portion of the tooth. The tooth is

■ Tooth replacements and restorations

Definition

A tooth restoration is any artificial substance or structure that replaces missing teeth or part of a tooth in order to protect the mouth's ability to eat, chew, and speak. Restorations include fillings, inlays, crowns, bridges, partial and complete dentures, and dental implants.

Purpose

Restorations have somewhat different purposes depending on their extensiveness. Fillings, inlays, and crowns are intended to repair damage to individual teeth. They replace tooth structure lost by decay or injury, protect the part of the tooth that remains, and restore the tooth's shape and function. Bridges, dentures, and implants are intended to protect the shape and function of the mouth as a whole.

Precautions

Some patients are allergic to the medications used for local anesthesia in dental restorations. In addition,

then prepared for a crown. It may be tapered on the outside edges to a peg, reinforced with a cast metal core, or rebuilt with both a cast metal core and a post. A wax impression of the prepared tooth and the teeth next to it is made. The new crown is made to fit this mold. The crown may be made of gold or stainless steel alone, metal with a veneer of tooth-colored porcelain or resin, or of porcelain or resin alone. The finished crown is then placed over the prepared tooth, adjusted, and cemented into place.

Bridges

Bridges are a type of restoration that is done when one or more permanent teeth are lost or pulled. The resulting gap must be filled in to prevent the remaining teeth from shifting. If the other teeth shift, they will affect the patient's bite (occlusion), which sometimes produces **pain** in the jaw joint. As the teeth move and become crooked, they also become more difficult to keep clean. The risk of tooth decay and gum disease increases, increasing the likelihood that additional teeth will be lost. A bridge is inserted to prevent this risk. Bridges are nonremovable appliances of one or more artificial teeth (pontics) anchored by crowns on the adjacent teeth (abutment teeth). The abutment teeth carry the pressure when the patient chews food.

Partial dentures

A partial denture is similar to a bridge in that it fills a gap left by missing teeth with artificial teeth on a metal frame. A partial denture is removable, however. It attaches to a crown on the abutment tooth with a metal clasp or precision attachment. A partial denture is primarily used at the end of a row of natural teeth, where there is only one abutment tooth. The pressure exerted by chewing is shared by this abutment and the soft tissues of the gum ridge beneath the appliance.

Complete dentures

Complete dentures may be worn when all of the top or bottom teeth have been lost. A complete denture consists of artificial teeth mounted in a plastic base molded to fit the remaining oral anatomy. It may or may not be held in place with a denture adhesive.

Implants

Dental implants are a means of securing crowns, bridges, and dentures in the mouth. A hard plastic or metal fixture is implanted through the soft tissue into the bone. Over time, the bone grows around this fixture, firmly anchoring it. The exposed end of this fixture is covered with a crown and may serve as a stable abutment for a bridge or denture.

Preparation

Before a restoration is placed in the mouth, the dentist removes all traces of decay and shapes the remaining tooth structure for the restoration. Fillings are the only restoration created within the tooth itself—the others are made up in a laboratory using a model of the tooth structure. Thus, a filling may be placed in a single dental visit, while the other restorations usually take several appointments. Temporary crowns and dentures are put in place after the tooth is shaped until the permanent restoration is delivered by the laboratory.

Aftercare

Fillings

Fillings need time to harden for several hours after being placed, so the patient should chew food on the opposite side of the mouth for the first day.

Dentures

A partial or complete denture may take several weeks of getting used to. Inserting and removing the denture will take practice. Speaking clearly may be difficult at first—the patient may find it helpful to read out loud for practice. Eating may also feel awkward. The patient should begin by eating small pieces of soft foods. Very hard or sticky foods should be avoided.

Patients with dentures must work on good **oral hygiene**. Specialty brushes and floss threaders may be used to remove plaque and food from around crowns and bridges. Dentures should be removed and brushed daily with a specially designed brush and a denture cleaner or other mild soap.

The patient should see the dentist for an adjustment if there is any discomfort or irritation resulting from a restoration. Otherwise, the patient should see the dentist at least twice a year for an oral examination.

Risks

Restoration procedures typically require local anesthesia. Some people may have allergic reactions to the medication. A very small number of people are allergic to one or more of the metals used in a dental restoration. In most cases, the dentist can use another material.

Normal results

A well-made restoration should feel comfortable and last a relatively long time with proper care. Artificial dental restorations only approximate the original tooth, however. A complete denture will never feel as comfortable or work

KEY TERMS

Abutment tooth—A crowned tooth that stabilizes a bridge or partial denture.

Bridge—An appliance of one or more artificial teeth anchored by crowns on the adjacent teeth.

Complete denture—A full set of upper or lower teeth, mounted in a plastic base. Dentures are also called false teeth.

Crown—A protective shell that fits over the tooth.

Dental caries—A disease of the teeth in which microorganisms convert sugar in the mouth to acid that erodes the tooth.

Enamel—The hard outermost surface of a tooth.

Filling—Dental material that occupies the space remaining within a tooth after the decayed portion has been removed.

Implant—A fixture with one end implanted into the bone and the other end covered with a crown, often to serve as a stable abutment for a bridge or denture.

Inlay—A filling that is made outside of the tooth and the cemented into place.

Occlusion—The way upper and lower teeth fit together during biting and chewing.

Partial denture—A removable bridge that usually clasps onto only one abutment.

Pontic—An artificial tooth.

Pulp—The soft innermost layer of a tooth that contains its blood vessels and nerves.

as well as natural teeth. It is better, therefore, to prevent the need for restorative dental work than to replace teeth. Restorations are expensive, may require many appointments, and still need careful cleaning and attention.

Resources

BOOKS

“Dentistry in Medicine—Dental Restorations and Appliances.” In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

ORGANIZATIONS

Academy of General Dentistry. Suite 1200, 211 East Chicago Ave., Chicago, IL 60611. (312) 440-4300. <<http://www.agd.org>>.

American Dental Association. 211 E. Chicago Ave., Chicago, IL 60611. (312) 440-2500. <<http://www.ada.org>>.

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Toothache

Definition

A toothache is any **pain** or soreness within or around a tooth, indicating inflammation and possible infection.

Description

A toothache may feel like a sharp pain or a dull ache. The tooth may be sensitive to pressure, heat, cold, or sweets. In cases of severe pain, identifying the problem tooth is often difficult. Any patient with a toothache should see a dentist at once for diagnosis and treatment. Most toothaches get worse if not treated.

Causes and symptoms

Toothaches may result from any of a number of causes:

- **tooth decay** (dental caries)
- inflammation of the tooth pulp (pulpitis)
- abscesses
- gum disease, including periodontitis
- loose or broken filling
- cracked or **impacted tooth**
- exposed tooth root
- food wedged between teeth or trapped below the gum line
- tooth nerve irritated by clenching or grinding of teeth (bruxism)
- pressure from congested sinuses
- traumatic injury

Diagnosis

Diagnosis includes identifying the location of the toothache, as well as the cause. The dentist begins by asking the patient specific questions about the toothache, including the types of foods that make the pain worse, whether the tooth is sensitive to temperature or biting, and whether the pain is worse at night. The dentist then exam-

ines the patient's mouth for signs of swelling, redness, and obvious tooth damage. The presence of pus indicates an **abscess** or gum disease. The dentist may flush the sore area with warm water to dislodge any food particles and to test for sensitivity to heat. The dentist may then dry the area with gauze to determine sensitivity to touch and pressure. The dentist may probe tooth crevices and the edges of fillings with a sharp instrument, looking for areas of tooth decay. Finally, the dentist may take x rays, looking for evidence of decay between teeth, a cracked or impacted tooth, or a disorder of the underlying bone.

Treatment

Emergency self-care

Toothaches should always be professionally treated by a dentist. Some methods of self-treatment, however, may help manage the pain until professional care is available:

- rinsing with warm salt water
- using dental floss to remove any food particles
- taking **aspirin** or **acetaminophen** (Tylenol) to relieve pain; the drug should be swallowed—*never* placed directly on the aching tooth or gum
- applying a *cold* compress against the outside of the cheek; do not use heat, because it will tend to spread infection
- using clove oil (*Syzygium aromaticum*) to numb the gums; the oil may be rubbed directly on the sore area or used to soak a small piece of cotton and applied to the sore tooth

Professional care

Treatment will depend on the underlying cause of the toothache. If the pain is due to tooth decay, the dentist will remove the decayed area and restore the tooth with a filling of silver amalgam or composite resin. Loose or broken fillings are removed, new decay cleaned out, and a new filling is placed. If the pulp of the tooth is damaged, root canal therapy is needed. The dentist or a specialist called an endodontist removes the decayed pulp, fills the space left behind with a soothing paste, and covers the tooth with a crown to protect and seal it. If the damage cannot be treated by these methods, or if the tooth is impacted, the tooth must be extracted.

Alternative treatment

Toothaches caused by infection or tooth decay must be treated by a dentist. Several alternative therapies may be helpful for pain relief until dental treatment is avail-

KEY TERMS

Abscess—A hole in the tooth or gum tissue filled with pus as the result of infection.

Bruxism—Habitual clenching and grinding of the teeth as a result of stress. The behavior usually occurs during sleep.

Cavity—A hole or weak spot in the tooth surface caused by decay.

Dental caries—A disease of the teeth in which microorganisms convert sugar in the mouth to acid, which then erodes the tooth.

Enamel—The hard outermost surface of a tooth.

Endodontist—A dentist who specializes in diagnosing and treating diseases of the pulp and other inner parts of the tooth.

Impacted tooth—A tooth that is growing against another tooth, bone, or soft tissue.

Periodontitis—A gum disease that destroys the structures supporting the teeth, including bone.

Pulp—The soft innermost part of a tooth, containing blood vessels and nerves.

Pulpitis—Inflammation of the pulp of a tooth that involves the blood vessels and nerves.

able. Clove oil (*Syzygium aromaticum*) may be rubbed on sensitive gums to numb them or added to a small cotton pellet that is then placed into or over a hole in the tooth. The herb corydalis (*Corydalis yanhusuo*) may also help relieve toothache pain. Pain also may be reduced using **acupressure**, **acupuncture**, or **reiki**. Acupuncture should be done only by a licensed practitioner.

Prognosis

Prompt dental treatment provides a positive outcome for toothache. In the absence of active infection, fillings, root canal treatments, or extractions may be performed with minimal discomfort to the patient. When a toothache is left untreated, a severe infection may develop and spread to the sinuses or jawbone, and eventually cause blood **poisoning**.

Prevention

Maintaining proper **oral hygiene** is the key to preventing toothaches. The best way to prevent tooth decay is to brush at least twice a day, preferably after every

meal and snack. Flossing once a day also helps prevent gum disease by removing food particles and bacteria at and below the gum line, as well as between teeth. People should visit their dentist at least every six months for oral examinations and professional cleaning.

Resources

ORGANIZATIONS

Academy of General Dentistry. Suite 1200, 211 East Chicago Ave., Chicago, IL 60611. (312) 440-4300. <<http://www.agd.org>>.

American Dental Association. 211 E. Chicago Ave., Chicago, IL 60611. (312) 440-2500. <<http://www.ada.org>>.

OTHER

Medical Source. Medical Alliances, Inc. 2121 Eisenhower Ave., Suite 603, Alexandria, VA 22314. (800) 463-6482 <<http://www.medsource.com>>.

Bethany Thivierge

Topical antibiotics see **Antibiotics, topical**

Topical antifungal drugs see **Antifungal drugs, topical**

TORCH test

Definition

The TORCH test, which is sometimes called the TORCH panel, belongs to a category of blood tests called infectious-disease antibody titer tests. This type of blood test measures the presence of antibodies (protein molecules produced by the human immune system in response to a specific disease agent) and their level of concentration in the blood. The name of the test comes from the initial letters of the five disease categories. The TORCH test measures the levels of an infant's antibodies against five groups of chronic infections: *toxoplasmosis*, *other infections*, *rubella*, *cytomegalovirus (CMV)*, and *herpes simplex virus (HSV)*. The "other infections" usually include **syphilis**, **hepatitis B**, coxsackie virus, Epstein-Barr virus, varicella-zoster virus, and human parvovirus.

Since the TORCH test is a screening or first-level test, the pediatrician may order tests of other body fluids or tissues to confirm the diagnosis of a specific infection. In the case of **toxoplasmosis**, **rubella**, and **syphilis**, cerebrospinal fluid may be obtained from the infant through a spinal tap in order to confirm the diagnosis. In the case of CMV, the diagnosis is confirmed by culturing the virus in a sample of the infant's urine. In HSV infections, tissue culture is the best method to confirm the diagnosis.

Purpose

The five categories of organisms whose antibodies are measured by the TORCH test are grouped together because they can cause a cluster of symptomatic **birth defects** in newborns. This group of defects is sometimes called the TORCH syndrome. A newborn baby with these symptoms will be given a TORCH test to see if any of the five types of infection are involved.

The symptoms of the TORCH syndrome include:

- Small size in proportion to length of the mother's **pregnancy** at time of delivery. Infants who are smaller than would be expected (below the tenth percentile) are referred to as small-for-gestational-age, or SGA.
- Enlarged liver and spleen
- Low level of platelets in the blood
- Skin rash. The type of skin rash associated with the TORCH syndrome is usually reddish-purple or brown and is caused by the leakage of blood from broken capillaries into the baby's skin.
- Involvement of the central nervous system. These defects can include **encephalitis**, calcium deposits in the brain tissue, and seizures.
- Jaundice. The yellowish discoloration of the skin and whites of the eyes due to liver disease.

In addition to these symptoms, each of the TORCH infections has its own characteristic symptom cluster in newborns:

Toxoplasmosis

Toxoplasmosis is caused by *Toxoplasma gondii*, a parasite that the mother can acquire from handling infected cats, drinking unpasteurized milk, or eating contaminated meat. The infection is carried to the infant through the mother's placenta, and can cause infections of the eyes or central nervous system. The organism can invade brain or muscle tissue and form tissue cysts. The later in pregnancy that the mother is infected, the higher the probability that the fetus will be infected. On the other hand, toxoplasmosis early in pregnancy is more likely to cause a **miscarriage** or serious birth defects. The incidence of toxoplasmosis in newborns is one in 1,000 live births.

Other (syphilis)

Syphilis is caused by a spirochete (spiral- or coil-shaped bacterium), *Treponema pallidum*. It is transmitted in the adult population by sexual intercourse. About 2–5% of children born to mothers diagnosed with syphilis will have the disease at birth. Syphilis was added to the

TORCH panel because of a rapid increase in reported cases since 1990. It is also a potentially life-threatening infection for the fetus. Syphilis can cause early delivery, miscarriage, or **stillbirth**. The mortality rate in infants infected with syphilis is about 54%.

Rubella

Rubella is a virus that has a seasonal pattern, with epidemics most likely in the spring. Between 0.1-2% of newborns will be infected with rubella. The rate of fetal infection varies according to the timing of the mother's infection during pregnancy. Birth defects, however, are most likely (85%) in infants infected during the first eight weeks of pregnancy. Infants born with rubella may already show signs of heart disease, retarded growth, **hearing loss**, blood disorders, vision problems, or **pneumonia**. They may also develop problems later in childhood, including **autism**, hearing loss, brain syndromes, immune system disorders, or thyroid disease.

Cytomegalovirus (CMV)

Cytomegalovirus belongs to the herpesvirus group of infections. It can be transmitted through body secretions, as well as by sexual contact; some newborns acquire CMV through the mother's breast milk. In adults, it produces symptoms resembling those of mononucleosis. About 1–2.2% of newborns in the United States are infected with CMV. Of this group, 10% will have measurable symptoms. The mortality rate for these symptomatic newborns is 20–30%. Surviving infants with CMV may suffer from hearing problems (15%) or **mental retardation** (30%). Newborns that acquire CMV during the birth process or shortly after birth may develop pneumonia, hepatitis, or various blood disorders.

Herpes simplex virus (HSV)

Herpesvirus infections are among the most common viral infections in humans. They are spread by oral, as well as genital, contact. It is estimated that between 1 in 1,000 and 1 in 5,000 infants are born with HSV infections. About 80% of these infections are acquired during the birth process itself; the virus enters the infant through its eyes, skin, mouth, and upper respiratory tract. Of infants born with HSV infection, about 20% will have localized infections of the eyes, mouth, or skin. About 50% of infected infants will develop disease spread throughout the body (disseminated) within nine to 11 days after birth. Disseminated herpes infections attack the liver and adrenal glands, as well as other body organs. Without treatment, the mortality rate is 80%. Even with antiviral medication, the mortality rate is still 15–20%, with 40–55% of the survivors having long-term

damage to the central nervous system. It is critical for the doctor to diagnose HSV infection in the newborn as soon as possible, for effective treatment.

Description

The TORCH panel requires a sample of the infant's blood. Samples from infants are usually obtained by the heelstick procedure when only a small quantity of blood is needed. The baby's foot is wrapped in a warm cloth for five minutes, to make the blood flow more easily. The foot is then wiped with an alcohol swab and a lancet is used to stick the baby's heel on one side. It is important to avoid the center of the heel, in order to prevent an inflammation of the bone.

Preparation

No special preparation, other than sterile technique, is required.

Risks

The only complications associated with the TORCH test are those resulting from the heelstick technique itself. These risks include scarring, infection of the bone, **cellulitis** (inflammation of cellular tissue), small lumpy calcium deposits, and inaccurate test results.

Normal results

The normal result would be normal levels of immunoglobulin M (IgM) antibody in the infant's blood. IgM is one of five types of protein molecules found in blood that function as antibodies. IgM is a specific class of antibodies that seeks out virus particles. In contrast to adults, IgM is the most common type of immunoglobulin in newborn children. It is, therefore, the most useful indicator of the presence of a TORCH infection.

Abnormal results

The general abnormal, or positive, finding would be high levels of IgM antibody. The test can be refined further for antibodies specific to given disease agents. The TORCH screen, however, can produce both false-positive and false-negative findings. Doctors can measure IgM levels in the infant's cerebrospinal fluid, as well as in the blood, if they want to confirm the TORCH results.

Resources

BOOKS

- Cruse, Julius M., and Robert E. Lewis. *Illustrated Dictionary of Immunology*. New York: CRC Press, 1995.
“Infectious Diseases: TORCH Infections.” In *Neonatology: Management, Procedures, On-Call Problems, Diseases*

KEY TERMS

Antibody—A protein molecule produced by the immune system that is specific to a disease agent, such as CMV and the other organisms sought by the TORCH test. The antibody combines with the organism and disables it.

Perinatal—Referring to the period of time surrounding an infant's birth, from the last two months of pregnancy to the first 28 days of life. The TORCH panel tests for perinatal infections.

Small-for-gestational-age (SGA)—A term used to describe newborns who are below the 10th percentile in height or weight for their estimated gestational age. The gestational age is based upon the date of the mother's last menstrual period. SGA is one of the symptoms of TORCH syndrome.

Titer—The concentration of a substance in a given sample of blood or other tissue fluid.

and Drugs, ed. Tricia Lacy Gomella, et al. Norwalk, CT: Appleton & Lange, 1994.

Levin, Myron J. "Infections: Viral & Rickettsial." In *Current Pediatric Diagnosis & Treatment*, ed. William W. Hay Jr., et al. Stamford: Appleton & Lange, 1997.

"Pediatrics and Genetics: Disturbances in Newborns and Infants." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

"Procedures: Heelstick (Capillary Blood Sampling)." In *Neonatology: Management, Procedures, On-Call Problems, Diseases and Drugs*, ed. Tricia Lacy Gomella, et al. Norwalk, CT: Appleton & Lange, 1994.

Rebecca J. Frey, PhD

Torticollis

Definition

Torticollis (cervical dystonia or spasmodic torticollis) is a type of movement disorder in which the muscles controlling the neck cause sustained twisting or frequent jerking.

Description

In torticollis, certain muscles controlling the neck undergo repetitive or sustained contraction, causing the

neck to jerk or twist to the side. Cervical dystonia causes forward twisting, and is called antecollis. Backward twisting is known as retrocollis. The abnormal posture caused by torticollis is often debilitating, and is usually painful.

Torticollis most commonly begins between age 30–60, with females affected twice as often as males. According to the National Spasmodic Torticollis Association, torticollis affects 83,000 people in the United States. Dystonia tends to become more severe during the first months or years after onset, and may spread to other regions, especially the jaw, arm, or leg. Torticollis should not be confused with such other causes of abnormal neck posture as orthopedic or congenital problems.

Causes and symptoms

The nerve signals responsible for torticollis are thought to originate in the basal ganglia, a group of brain structures involved in movement control. The exact defect is unknown. Some cases of dystonia are due to the inheritance of a defective gene, whose function was unknown as of mid-1998. Other cases are correlated with neck or head trauma, such as from an automobile accident. Use of certain **antipsychotic drugs**, or neuroleptics, can induce dystonia.

There are three types of torticollis:

- tonic, in which the abnormal posture is sustained
- clonic, marked by jerky head movements.
- mixed, a combination of tonic and clonic movements

Symptoms usually begin gradually, and may be intermittent at first, worsening in times of **stress**. Symptoms usually progress over two to five years, and then remain steady. Symptoms may be relieved somewhat when lying down. Many people with torticollis can temporarily correct their head position by sensory tricks, as touching the chin or cheek on the side opposite the turning. The reason for the effectiveness of this "geste antagoniste," as it is called, is unknown.

Pain in the neck, back, or shoulder affects more than two-thirds of all people with torticollis. Pain may spread to the arm or hand.

Diagnosis

Diagnosis of torticollis is aided by an electrical study (**electromyography**) that can detect overactive muscles. Imaging studies, including x rays, may be done to rule out other causes of abnormal posture. A detailed medical history is needed to determine possible causes, including trauma.

Treatment

A variety of oral drugs are available to relax muscles, including baclofen. For a subgroup of patients, L-dopa provides effective relief. Denervation of the involved neck muscles may be performed with injection of alcohol or phenol on to the nerve.

Injection of botulinum toxin (BTX) is considered by many to be the treatment of choice. By preventing release of chemical messages from the nerve endings that stimulate the involved muscles, BTX partially paralyzes the muscles, therefore allowing more normal posture and range of motion. BTX treatment lasts several months, and may be repeated.

Physical therapy can help relieve secondary consequences of torticollis. Regular muscle stretching prevents contracture, or permanent muscle shortening. Pain and spasm may be temporarily lessened with application of heat or ice. Stress management techniques may help prevent worsening. An occupational therapist can suggest home or work modifications to reduce **fatigue** and improve function. Braces constructed to replace the patient's own sensory tricks may help reduce abnormal posture.

Alternative treatment

Biofeedback may be effective for some patients. Regular **massage therapy** can reduce additional pain in compensating areas of the body. Two energy-based therapies, **acupuncture** and homeopathic medicine, can work to rebalance the whole person, helping to correct the torticollis. Antispasmodic herbs may help to relax the muscles. In addition, herbs that can help balance the stimulus from the nervous system are often recommended.

Prognosis

Spontaneous remission is seen in up to 20% of patients, most often those patients with older onset and milder symptoms. Dystonia may spread to affect other regions of the body.

Prevention

There is no way known to prevent torticollis.

Resources

BOOKS

Watts, R. L., and W. C. Koller, eds. *Movement Disorders*. New York: McGraw-Hill, 1997.

ORGANIZATIONS

National Spasmodic Torticollis Association. P.O. Box 5849, Orange, CA 92863-5849. (800) 487-8385. <<http://www.bluheronweb.com>>.

Worldwide Education and Awareness for Movement Disorders.

One Gustave L. Levy Place, Box 1052, New York, NY 10029. (800) 437-6683. <<http://www.wemove.org>>.

Richard Robinson

Total protein test see **Protein components test**

Tourette syndrome

Definition

Tourette syndrome (TS) is an inherited disorder of the nervous system, characterized by a variable expression of unwanted movements and noises (tics).

Description

The first references in the literature to what might today be classified as Tourette syndrome largely describe individuals who were wrongly believed to be possessed by the devil. In 1885 Gilles de la Tourette, a French neurologist, provided the first formal description of this syndrome, which he described as an inherited neurological condition characterized by motor and vocal tics.

Although vocal and motor tics are the hallmark of Tourette syndrome, such other symptoms as the expression of socially inappropriate comments or behaviors, obsessive compulsive disorder, attention deficit disorder, self-injuring behavior, depression, and **anxiety** also appear to be associated with Tourette syndrome. Most research suggests that Tourette syndrome is an autosomal dominant disorder, although a gene responsible for Tourette syndrome has not yet been discovered.

Tourette syndrome is found in all populations and all ethnic groups, but is three to four times more common in males than females and is more common in children than adults. The exact frequency of Tourette syndrome is unknown, but estimates range from 0.05% to 3%.

Causes and symptoms

The cause of Tourette syndrome is unknown, although some studies suggest that the tics in Tourette syndrome are caused by an increased amount of a neurotransmitter called dopamine. A neurotransmitter is a chemical found in the brain that helps to transmit information from one brain cell to another. Other studies suggest that the defect in Tourette syndrome involves another neurotransmitter called serotonin; or involves other chemicals required for normal functioning of the brain.

Most studies suggest that Tourette syndrome is an autosomal dominant disorder with decreased penetrance, although this hypothesis has not been proven and may not be true in all families. An autosomal dominant disorder results from a change in one copy of a pair of genes. Individuals with an autosomal dominant disorder have a 50% chance of passing on the changed gene to their children. Decreased penetrance means that not all people who inherit the changed gene will develop symptoms. There is some evidence that females who inherit the Tourette syndrome gene have a 70% chance of exhibiting symptoms and males have a 99% chance of having symptoms. It has been suggested that other genetic and environmental factors may play a role in the development of symptoms in people who inherit the changed gene but none have been discovered. Some researchers believe that Tourette syndrome has different causes in different individuals or is caused by changes in more than one gene, although these theories are less substantiated. Further research is needed to establish the cause of Tourette syndrome.

Motor and vocal tics

The principal symptoms of Tourette syndrome include simple and complex motor and vocal tics. Simple motor tics are characterized by brief muscle contractions of one or more limited muscle groups. An eye twitch is an example of a simple motor tic. Complex motor tics tend to appear more complicated and purposeful than simple tics, and involve coordinated contractions of several muscle groups. Some examples of complex motor tics include the act of hitting oneself and jumping. Copropraxia, the involuntary display of unacceptable/obscene gestures; and echopraxia, the imitation of the movement of another individual, are other examples of complex motor tics.

Vocal tics are actually manifestations of motor tics that involve the muscles required for vocalization. Simple vocal tics include **stuttering**, stammering, abnormal emphasis of part of a word or phrase, and inarticulate noises such as throat clearing, grunts, and high-pitched sounds. Complex vocal tics typically involve the involuntary expression of words. Perhaps the most striking example of this is coprolalia, the involuntary expression of obscene words or phrases, which occurs in fewer than one-third of people with Tourette syndrome. The involuntary echoing of the last word, phrase, sentence or sound vocalized by oneself (phalilalia) or of another person or sound in the environment (echolalia) are also classified as complex tics.

The type, frequency, and severity of tics exhibited varies tremendously between individuals with Tourette syndrome. Tourette syndrome has a variable age of onset

and tics can start anytime between infancy and age 18. Initial symptoms usually occur before the early teens; the mean age of onset for both males and females is approximately seven years of age. Most individuals with symptoms initially experience simple muscle tics involving the eyes and the head. These symptoms can progress to tics involving the upper torso, neck, arms, hands, and occasionally the legs and feet. Complex motor tics are usually the latest-onset muscle tics. Vocal tics usually have a later onset than motor tics. In some rare cases, people with Tourette syndrome suddenly present with multiple, severe, or bizarre symptoms.

Not only is there extreme variability in clinical symptoms between individuals with Tourette syndrome, but individuals commonly experience a variability in type, frequency, and severity of symptoms over the course of their lifetime. Adolescents with Tourette syndrome often experience unpredictable and variable symptoms, which may be related to fluctuating hormone levels and decreased compliance in taking medications. Adults often experience a decrease in symptoms or a complete end to symptoms.

A number of factors appear to affect the severity and frequency of tics. **Stress** appears to increase the frequency and severity of tics, while concentration on another part of the body that is not involved in a tic can result in the temporary alleviation of symptoms. Relaxation, following attempts to suppress the occurrence of tics, may result in an increased frequency of tics. An increased frequency and severity of tics can also result from exposure to such drugs as steroids, **cocaine**, amphetamines, and **caffeine**. Hormonal changes such as those that occur prior to the menstrual cycle can also increase the severity of symptoms.

Other associated symptoms

People with Tourette syndrome are more likely to exhibit non-obscene, socially inappropriate behaviors such as expressing insulting or socially unacceptable comments or socially unacceptable actions. It is not known whether these symptoms stem from a more general dysfunction of impulse control that might be part of Tourette syndrome.

Tourette syndrome appears to also be associated with attention deficit disorder (ADD). ADD is a disorder characterized by a short attention span and impulsivity, and in some cases hyperactivity. Researchers have found that 21–90% of individuals with Tourette syndrome also exhibit symptoms of ADD, whereas 2–15% of the general population exhibit symptoms of ADD.

People with Tourette syndrome are also at higher risk for having symptoms of **obsessive-compulsive disorder** (OCD). OCD is a disorder characterized by persis-

tent, intrusive, and senseless thoughts (obsessions) or compulsions to perform repetitive behaviors that interfere with normal functioning. A person with OCD, for example, may be obsessed with germs and may counteract this obsession with continual hand washing. Symptoms of OCD are present in 1.9–3% of the general population, whereas 28–50% of people with Tourette syndrome have symptoms of OCD.

Self-injurious behavior (SIB) is also seen more frequently in those with Tourette syndrome. Approximately 34–53% of individuals with Tourette syndrome exhibit some form of self-injuring behavior. The SIB is often related to OCD but can also occur in those with Tourette syndrome who do not have OCD.

Symptoms of anxiety and depression are also found more commonly in people with Tourette syndrome. It is not clear, however, whether these symptoms are symptoms of Tourette syndrome or occur as a result of having to deal with the symptoms of moderate to severe Tourette syndrome.

People with Tourette syndrome may also be at increased risk for having learning disabilities and **personality disorders**; and may be more predisposed to such behaviors as aggression, antisocial behaviors, severe temper outbursts, and inappropriate sexual behavior. Further controlled studies need to be performed, however, to ascertain whether these behaviors are symptoms of Tourette syndrome.

Diagnosis

Tourette syndrome cannot be diagnosed through a blood test. The diagnosis is made through observation and interview of the patient and discussions with other family members. The diagnosis of Tourette syndrome is complicated by a variety of factors. The extreme range of symptoms of this disorder makes it difficult to differentiate Tourette syndrome from other disorders with similar symptoms. Diagnosis is further complicated by the fact that some tics appear to be within the range of normal behavior. For example an individual who only exhibits such tics as throat clearing and sniffing may be misdiagnosed with a medical problem such as **allergies**. In addition, such bizarre and complex tics as coprolalia may be mistaken for psychotic or “bad” behavior. Diagnosis is also confounded by individuals who attempt to control tics in public and in front of health care professionals, and deny the existence of symptoms. Although there is disagreement over what criteria should be used to diagnose Tourette syndrome, one aid in the diagnosis is the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). The DSM-IV outlines suggested

diagnostic criteria for a variety of conditions, including Tourette syndrome.

DSM-IV criteria:

- presence of both motor and vocal tics at some time during the course of the illness
- the occurrence of multiple tics nearly every day through a period of more than one year, without a remission of tics for a period of greater than three consecutive months
- the symptoms cause distress or impairment in functioning
- age of onset of prior to 18 years of age
- the symptoms are not due to medications or drugs and are not related to another medical condition

Some physicians critique the DSM-IV criteria, arguing that they do not include the full range of behaviors and symptoms seen in Tourette syndrome. Others criticize the criteria since they limit the diagnosis to those who experience a significant impairment, which may not be true for individuals with milder symptoms. For this reason many physicians use their clinical judgment as well as the DSM-IV criteria as a guide to diagnosing Tourette syndrome.

Treatment

There is no cure for Tourette syndrome. Treatment involves the control of symptoms through educational and psychological interventions and/or medications. The treatment and management of Tourette syndrome varies from patient to patient and should focus on the alleviation of the symptoms that are most bothersome to the patient or that cause the most interference with daily functioning.

Psychological and educational interventions

Psychological treatments such as counseling are not generally useful for the treatment of tics but can be beneficial in the treatment of such associated symptoms as obsessive-compulsive behavior and attention deficit disorder. Counseling may also help individuals to cope better with the symptoms of this disorder and to have more positive social interactions. Psychological interventions may also help people cope better with stressors that can normally be triggers for tics and negative behaviors. Relaxation therapies may, however, increase the occurrence of tics. The education of family members, teachers, and peers about Tourette syndrome can be helpful and may help to foster acceptance and prevent social **isolation**.

Medications

Many people with mild symptoms of Tourette syndrome never require medications. Those with severe

symptoms may require medications for all or part of their lifetime. The most effective treatment of tics associated with Tourette syndrome involves the use of drugs such as haloperidol, pimozide, sulpiride, and tiapride, which decrease the amount of dopamine in the body. Unfortunately, the incidence of side effects, even at low dosages, is quite high. The short-term side effects can include **sedation**, dysphoria, weight gain, movement abnormalities, depression, and poor school performance. Long-term side effects can include **phobias**, memory difficulties, and personality changes. These drugs are therefore better candidates for short-term rather than long-term therapy.

Tourette syndrome can also be treated with such other drugs as clonidine, clonazepam, and risperidone, but the efficacy of these treatments is unknown. In many cases, treatment of such associated conditions as ADD and OCD is often more of a concern than the tics themselves. Clonidine used in conjunction with such stimulants as Ritalin may be useful for treating people with Tourette syndrome who also have symptoms of ADD. Stimulants should be used with caution in individuals with Tourette syndrome since they can sometimes increase the frequency and severity of tics. OCD symptoms in those with Tourette syndrome are often treated with such drugs as Prozac, Luvox, Paxil, and Zoloft.

In many cases the treatment of Tourette syndrome with medications can be discontinued after adolescence. Trials should be performed through the gradual tapering off of medications and should always be done under a doctor's supervision.

Prognosis

The prognosis for Tourette syndrome in individuals without associated psychological conditions is often quite good, and only approximately 10% of Tourette syndrome individuals experience severe tic symptoms. Approximately 30% of people with Tourette syndrome will experience a decrease in the frequency and severity of tics, and another 30–40% will experience a complete end of symptoms by late adolescence. The other 30–40% will continue to exhibit moderate to severe symptoms in adulthood. There does not appear to be a definite correlation between the type, frequency, and severity of symptoms and the eventual prognosis. Patients with severe tics may experience social difficulties and may isolate themselves from others in fear of shocking and embarrassing them. People with Tourette syndrome who have such other symptoms as obsessive compulsive disorder, attention deficit disorder, and self-injurious behavior usually have a poorer prognosis.

KEY TERMS

Attention deficit disorder (ADD)—Disorder characterized by a short attention span, impulsivity, and in some cases hyperactivity.

Autosomal dominant—A pattern of genetic inheritance in which only one abnormal gene is needed to display the trait or disease.

Coprolalia—The involuntary expression of obscene words or phrases.

Coprophagia—The involuntary display of unacceptable/obscene gestures.

Decreased penetrance—Individuals who inherit a changed disease gene but do not develop symptoms.

Dysphoria—Feelings of anxiety, restlessness, and dissatisfaction.

Echolalia—Involuntary echoing of the last word, phrase, or sentence spoken by someone else or sound in the environment.

Echopraxia—The imitation of the movement of another individual.

Neurotransmitter—Chemical in the brain that transmits information from one nerve cell to another.

Obsessive compulsive disorder (OCD)—Disorder characterized by persistent, intrusive, and senseless thoughts (obsessions) or compulsions to perform repetitive behaviors that interfere with normal functioning.

Phalilalia—Involuntary echoing of the last word, phrase, sentence, or sound vocalized by oneself.

Tic—Brief and intermittent involuntary movement or sound.

Resources

BOOKS

Haerle, Tracy, ed., and Jim Eisenreich. *Children with Tourette Syndrome: A Parent's Guide*. Bethesda, MD: Woodbine House, 1992.

Leckman, James, and Donald Cohen. *Tourette's Syndrome: Tics, Obsessions, Compulsions: Development, Psychopathology and Clinical Care*. New York: John Wiley & Sons, 1999.

PERIODICALS

Alsobrook, J.P. II, and D.L. Pauls. "The Genetics of Tourette Syndrome." *Neurologic Clinics* 15 (May 1997): 381–393.

- Chappell, P.B., L.D. Scahill, and J.F. Leckman. "Future Therapies of Tourette Syndrome." *Neurologic Clinics* 15 (May 1997): 429-450.
- Eidelberg, D., et al. "The Metabolic Anatomy of Tourette's Syndrome." *Neurology* 48 (April 1997): 927-934.
- Freeman, R.D. "Attention Deficit Hyperactivity Disorder in the Presence of Tourette Syndrome." *Neurologic Clinics* 15 (May 1997): 411-420.
- Lichter, D.G., and L.A. Jackson. "Predictors of Clonidine Response in Tourette Syndrome: Implications and Inferences." *Journal of Child Neurology* 11 (March 1997): 93-97.
- Robertson, Mary. "Tourette Syndrome, Associated Conditions and the Complexities of Treatment." *Brain* 123 (2000): 425-462.

ORGANIZATIONS

- National Institute of Neurological Disorders and Stroke. 31 Center Drive, MSC 2540, Bldg. 31, Room 8806, Bethesda, MD 20814. (301) 496-5751 or (800) 352-9424. <<http://www.ninds.nih.gov>>.
- National Tourette Syndrome Association, Inc. 42-40 Bell Blvd., Bayside, NY 11361-2820. (718) 224-2999. Fax: (718) 279-9596. tourette@ix.netcom.com.
- Tourette Syndrome Foundation of Canada. 194 Jarvis Street, #206, Toronto, ONT M5B 2B7. Canada (800) 361-3120. tsfc.org@sympatico.ca. <<http://www.tourette.ca>>.

OTHER

- "About Tourette Syndrome." Tourette Help. <<http://www.tourettehelp.com/pages/patient/about.html>>.
- "Tourette's Disorder." Internet Mental Health. <<http://www.mentalhealth.com/fr20.html>>.

Lisa Maria Andres, MS, CGC

Toxic encephalopathy see **Delirium**

Toxic epidermal necrolysis

Definition

Toxic epidermal necrolysis is a rare condition that causes large portions of the epidermis, the skin's outermost layer, to detach from the layers of skin below. A reaction to a medication is the primary cause.

Description

Toxic epidermal necrolysis (TEN) begins with **fever**, **cough**, and other nonspecific symptoms, and is soon followed by purplish, bloody-looking lesions on the skin and mucous membranes. These early lesions, typically found on the head, neck, and upper chest, soon merge and blister. Sheets of epidermis then begin to

detach from the skin layers below. In time, the entire surface of the skin may be involved, with detachment of 100% of the epidermis.

Causes and symptoms

The main cause of TEN is a severe drug reaction. Some investigators believe there may be additional infectious causes. A severe reaction in transplant patients, called **graft-vs.-host disease**, can also produce TEN. One study reported more than 100 different drugs as causes of TEN. The drugs most commonly implicated, however, include antibacterial **sulfonamides** such as sulfadiazine, **antibiotics** such as aminopenicillins and **cephalosporins**, and anticonvulsants like phenytoin. TEN is extremely rare. Researchers estimate that there are 0.2 cases per million users of aminopenicillins and 4.5 cases per million users of sulfonamides.

Exactly what leads to detachment of the epidermis remains unclear. People with TEN seem to have difficulty metabolizing the offending drug. Some researchers suggest that certain substances that should be cleared from the body instead get deposited on the outer shell of the epidermis, causing an immune response that leads the body to "reject" the skin.

Diagnosis

Diagnosis is made primarily on the appearance and spread of the **skin lesions**, and on a history that includes introduction of a new medication within the previous one to three weeks. A biopsy of the early lesions will confirm the diagnosis. Physicians will consider other potential diseases that cause similar symptoms before reaching a diagnosis of TEN. One is **erythema multiforme**, a recurrent skin disorder that produces lesions similar in appearance to TEN. However, this disorder is not caused by a drug reaction and does not lead to sheet-like shedding of the skin. Another disease, Stevens-Johnson syndrome, is a drug-induced skin disease that some experts believe is really a milder form of TEN. **Staphylococcal scalded skin syndrome** (SSSS) also looks like TEN, but it is caused by a staphylococcal infection. Unlike TEN, which occurs rarely in children, SSSS primarily affects infants, young children, and adults with weakened immune systems.

Treatment

There is no specific treatment for TEN. Patients are typically treated in an intensive care unit or in a burn unit and receive treatment similar to that given to patients with major **burns**. With the loss of skin, severe **dehydration** is a major risk, so health care workers will attempt to replace fluids intravenously. Nutritional supplementa-

KEY TERMS

Epidermis—The outermost layer of the skin.

Erythema multiforme—A recurrent skin disorder that produces lesions similar in appearance to TEN, but is not caused by a drug reaction and does not lead to sheet-like shedding of the skin.

Staphylococcal scalded skin syndrome—A disease caused by *Staphylococcus aureus*, in which large sheets of skin may peel away from the body. It most often affects infants, young children, and people with weakened immune systems.

Stevens-Johnson syndrome—A drug-induced skin disease that some experts believe is really a milder form of TEN.

tion from a tube routed through the nose to the stomach may also be contemplated to promote the healing of the skin. Infection is a major risk, so some physicians “paint” the open lesions with topical **antiseptics**. Others use skin grafts taken from cadavers or cultured skin substitutes to cover large open areas until healing can occur. Some investigators believe systemic **corticosteroids** are useful in the treatment of TEN. But since these medications have also been implicated as a cause in some cases of TEN and are known to suppress the immune system, their use should be considered carefully.

Prognosis

About 25–30% of patients with TEN die. Elderly patients, those with extensive skin lesions, and those with **AIDS** have the worst prognosis. Widespread systemic infection (**sepsis**) is the primary cause of **death**. Survivors, however, will be completely healed in three to four weeks.

Prevention

There is no prevention for TEN. No reliable test can indicate that a specific drug may cause TEN in a specific patient. Some researchers believe skin tests of potentially offending drugs may prove useful in the future.

Resources

BOOKS

Fitzpatrick, Thomas B., et al. *Color Atlas and Synopsis of Clinical Dermatology*. New York: McGraw-Hill, 1997.

Helm, Klaus F., and James G. Marks Jr. *Atlas of Differential Diagnosis in Dermatology*. New York: Churchill Livingstone, 1996.

PERIODICALS

Revuz, Jean E., and Jean Claude Roujeau. “Advances in Toxic Epidermal Necrolysis.” *Seminars in Cutaneous Medicine and Surgery* 15 (Dec. 1996): 258–266.

Weightman, Warren. “Toxic Epidermal Necrolysis.” *Australasian Journal of Dermatology* 37 (Nov. 1996): 167–177.

ORGANIZATIONS

American Academy of Dermatology. 930 N. Meacham Road, P.O. Box 4014, Schaumburg, IL 60168-4014. (847) 330-0230. <<http://www.aad.org>>.

Richard H. Camer

Toxic shock syndrome

Definition

Toxic shock syndrome (TSS) is an uncommon, but potentially serious, illness that occurs when poisonous substances (toxins) produced by certain bacteria enter the bloodstream. The toxins cause a type of blood **poisoning** caused by staphylococcal, or less commonly streptococcal, infections in the lungs, throat, skin or bone, or from injuries. Women using super-absorbent tampons during menstruation were found to be most likely to get toxic shock syndrome.

Description

TSS first came to the attention of the public in the 1970s. Shortly after the introduction of a super-absorbent tampon, young women across the United States experienced an epidemic of serious but unexplained symptoms. Thousands went to emergency rooms with high **fever**, vomiting, peeling skin, low blood pressure, **diarrhea**, and a rash resembling **sunburn**. The only thing they had in common was that they all were menstruating at the time they felt sick, and all were using tampons—especially super absorbent products.

At its height, the epidemic affected 15,000 people in the United States each year between 1980 and 1984; 15% of the women died. Since the offending products were taken off the market, the numbers of TSS cases have declined sharply. As of 1998, only about 5,000 cases are diagnosed annually in the United States, 5% of which are fatal. The decline is most likely due to the tampon manufacturers’ discontinuing the use of some synthetic materials, and the removal from the market of the brand of tampon associated with most cases of TSS. Today, most of these products are made with rayon and cotton.

In spite of TSS' association with menstruating women, the disease can affect anyone of either sex or any age or race. The infection may occur in children, men, and non-menstruating women who are weakened from surgery, injury, or disease, and who cannot fight off a staphylococcal infection. New mothers are also at higher risk for TSS.

Most cases reported in the recent past, however, still involve menstruating women under age 30. TSS still occurs in about 17 out of every 100,000 menstruating girls and women each year; more than half of these cases are related to tampons. Between five and 10% of patients with TSS die.

Streptococcal toxic shock syndrome (STSS)

A new type of toxic shock syndrome is caused by a different bacteria, called Group A streptococcus. This form of TSS is called streptococcal toxic shock syndrome, or STSS. Officially recognized in 1987, STSS is related to the strain of streptococcus nicknamed the "flesh-eating bacterium." STSS affects only one or two out of every 100,000 Americans. It almost never follows a simple "strep throat" infection.

Causes and symptoms

Transmission

TSS is caused by a strain of *Staphylococcus aureus* found in the nose, mouth, and occasionally the vagina. The bacteria produce a characteristic toxin. In large enough quantities, the toxin can enter the bloodstream, causing a potentially fatal infection.

While experts know the name of the bacterium, more than 10 years after the 1980s epidemic scientists still do not fully understand the link between TSS and tampons. Most medical researchers today suspect that the absorbent tampons introduce oxygen into the vagina, which is normally an oxygen-free area of the body. Oxygen triggers bacterial growth, and the more absorbent the tampon, the more bacteria it can harbor. Some experts believe that the reason TSS is linked to tampons in particular is that bacteria can contaminate and multiply in a tampon. If left in place for a long time—as a woman could do with a super-absorbent product—the bacteria have a better chance of multiplying and producing a large amount of toxin. It is also possible that the tampons or the chemicals they contain may irritate the vaginal lining, enabling the toxin to enter the bloodstream.

These types of bacteria are normally present either on hands or in the vagina, and it takes an amount of bacteria only the size of a grain of sand to start an infection. Of the 15% of women who carry *Staphylococcus*

aureus, only about 5% have the strain that produces the TSS toxin.

Symptoms

TSS. TSS begins suddenly, with a high fever of 102°F (38.9°C) or above, vomiting and watery diarrhea, headache, and sunburn-like rash; together with a **sore throat** and body aches. Blood pressure may plummet a day or two after the first symptoms appear. When the blood pressure drops, a woman may become disoriented or go into shock. Her kidneys may fail. After these developments, the skin on her hands and feet may peel.

STSS. STSS can occur after a streptococcal infection in the body, usually from an infected wound or even **chickenpox**. Within 48 hours, the patient's blood pressure drops. There is also fever, **dizziness**, breathing problems, and a weak, rapid pulse. The area around the wound may swell, the liver and kidneys can fail, and bleeding problems may occur.

Diagnosis

Any woman who is wearing a tampon and begins to experience the symptoms of toxic shock syndrome should remove the tampon right away and seek medical care.

The doctor will probably examine the vagina for signs of inflammation and rule out common **sexually transmitted diseases** with similar symptoms. A variety of blood tests, tests of vaginal secretions, and a **physical examination** are needed to identify this condition.

Treatment

TSS

In a menstruating woman, the vagina is first cleansed with an antiseptic solution to eliminate some of the bacteria that produce the toxin. TSS is treated with **antibiotics**, together with other drugs and fluids to lower fever and control blood pressure.

STSS

Antibiotics are used to treat STSS. Surgery may be needed to remove dead skin and muscle.

Prognosis

TSS lasts as long as three weeks, and has a tendency to recur. About a third of the women who are treated for TSS have it again within six months. In addition, TSS can affect the liver, kidneys, lungs, and other organs, depending on the severity of the infection. Untreated toxic shock syndrome can be fatal.

KEY TERMS

Shock—A condition in which the amount of blood circulating in the body is inadequate to meet the body's needs. Shock can be caused by certain diseases, serious injury, or blood loss.

Staphylococcus—A genus of bacteria that is commonly found on human skin and mucous membranes.

Streptococcus—A genus of sphere-shaped bacteria that can cause a wide variety of infections.

Toxin—A poisonous protein that is produced by some bacteria. A toxin is less complex than a poison.

Prevention

TSS

Women who wear tampons should change them often and use different brands and types of pads and tampons. If a woman really prefers tampons, experts recommend using the lowest possible absorbency product made of cotton and rayon, and wearing it only during the day. In the past, it was difficult to compare absorbency rates for different products. Today, the Food and Drug Administration (FDA) requires standardized absorbency measurements on all tampon boxes. Above all, women should wash their hands before inserting a tampon, and change the tampon every four to six hours.

Anyone who has had TSS even once should not use tampons again.

STSS

Doctors still are not sure how people can avoid STSS, but they advise patients to clean and bandage open **wounds** immediately. Anyone with a red, swollen, or tender wound, or a sudden fever should seek medical care.

Resources

BOOKS

Garrett, Laurie. *The Coming Plague*. New York: Penguin Books, 1994.

Turkington, Carol A. *Infectious Disease A to Z*. New York: Facts on File, 1998.

PERIODICALS

“CDC defines group A streptococcal toxic shock syndrome.” *American Family Physician* 47, no. 7 (15 May 1993): 1643-1644.

“Toxic Shock Syndrome—United States.” *Morbidity and Mortality Weekly Report* 46, no. 22 (6 June 1997): 492-495.

OTHER

Kids Health Page. <<http://KidsHealth.org>>.

Carol A. Turkington

Toxocariasis see **Roundworm infections**

Toxoplasma gondii infection see
Toxoplasmosis

Toxoplasmosis

Definition

Toxoplasmosis is an infectious disease caused by the one-celled protozoan parasite *Toxoplasma gondii*. Although most individuals do not experience any symptoms, the disease can be very serious, and even fatal, in individuals with weakened immune systems.

Description

Toxoplasmosis is caused by a one-celled protozoan parasite known as *Toxoplasma gondii*. Cats, the primary carriers of the organism, become infected by eating rodents and birds infected with the organism. Once ingested, the organism reproduces in the intestines of cats, producing millions of eggs known as oocysts, which are excreted in cat feces daily for approximately two weeks. In the United States, it is estimated that approximately 30% of cats have been infected by *T. gondii*. Oocysts are not capable of producing infection until approximately 24 hours after being excreted, but they remain infective in water or moist soil for approximately one year. When cattle, sheep, or other livestock forage through areas with contaminated cat feces, these animals become carriers of the disease. Fruits and vegetables can also become contaminated when irrigated with untreated water that has been contaminated with cat feces. In humans and other animals, the organisms produce thick-walled, dormant structures called cysts in the muscle and other tissues of the body.

Most humans contract toxoplasmosis by eating cyst-contaminated raw or undercooked meat, vegetables, or milk products. Humans can also become infected when they come into contact with the *T. gondii* eggs while cleaning a cat's litterbox, gardening, or playing in a sandbox, for instance. Once infected, an individual is immune to reinfection. The incubation period or period between

infection and the start of the disease ranges from several days to months.

Anyone can be infected by *T. gondii*, but usually only those individuals with weakened immune systems (immunocompromised) develop symptoms of the disease. For them, toxoplasmosis can be severe, debilitating, and fatal. Immunocompromised individuals at risk include those with **AIDS**, **cancer**, or other chronic illnesses.

There is no person-to-person transmission, except from an infected mother to her child in the womb. Approximately six out of 1,000 women contract toxoplasmosis during **pregnancy**. Nearly half of these maternal infections are passed on to the fetus. Known as congenital toxoplasmosis, this form of the disease is acquired at birth by approximately 3,300 infants in the United States every year. The risk of fetal infection is estimated to be between one in 1,000 to one in 10,000. In children born with toxoplasmosis, symptoms may be severe and quickly fatal, or may not appear until several months or even years after birth.

Causes and symptoms

Healthy individuals do not usually display symptoms. When symptoms do occur, they are usually mild, resembling **infectious mononucleosis**, and include the following:

- enlarged lymph nodes
- muscle pains
- fever that comes and goes
- general sick feeling

The distinction is made between acquired toxoplasmosis, in which an individual becomes infected, and neonatal congenital toxoplasmosis, in which a fetus is born with the infection because the mother became infected during pregnancy. If a fetus becomes infected early in pregnancy, the disease can cause the fetus to spontaneously abort, be stillborn. If full-term, the infant may die in infancy or suffer from central nervous system lesions. If the mother becomes infected in the last three months of pregnancy, however, the prognosis is good and the baby may not even display any symptoms.

In adults, if the infection continues for an extended period of time, chronic toxoplasmosis can cause an inflammation of the eyes called retinochoroiditis, which can lead to blindness, severe yellowing of the skin and whites of the eyes (**jaundice**), easy bruising, and convulsions.

Adults with weakened immune systems have a high risk of developing cerebral toxoplasmosis, including inflammation of the brain (**encephalitis**), one-sided weakness or numbness, mood and personality changes,

vision disturbances, muscle spasms, and severe headaches. If untreated, cerebral toxoplasmosis can lead to **coma** and **death**. This form of encephalitis is the second most common AIDS-related nervous system infection that takes advantage of a person's weakened immune system (opportunistic infection).

Diagnosis

A diagnosis of toxoplasmosis is made based on clinical signs and supporting laboratory results, including visualization of the protozoa in body tissue or **isolation** in animals and blood tests. Laboratory tests for toxoplasmosis are designed to detect increased amounts of a protein or antibody produced in response to infection with the toxoplasmosis organism. Antibody levels can be elevated for years, however, without active disease.

Treatment

Most individuals who contract toxoplasmosis do not require treatment because their immune systems are able to control the disease. Symptoms are not usually present. Mild symptoms may be relieved by taking over-the-counter medications, such as **acetaminophen** (Tylenol) and ibuprofen (Motrin, Advil). **Sore throat** lozenges and rest may also ease the symptoms.

Although the treatment of women infected with toxoplasmosis during pregnancy is controversial, most physicians feel that treatment is justified. Transmission of toxoplasmosis from the mother to the fetus may be prevented if the mother takes the antibiotic spiramycin. Later in a pregnancy, if the fetus has contracted the disease, treatment with the antibiotic pyrimethamine (Daraprim, Fansidar) or **sulfonamides** may be effective. Babies born with toxoplasmosis who show symptoms of the disease may be treated with pyrimethamine, the sulfa drug sulfadiazine (Microsulfon), and folic acid (an active form of **folic acid**).

AIDS patients who have not been infected may be given a drug called TMP/SMX (Bactrim or Septra) to prevent toxoplasmosis infection. To treat cases of toxoplasmosis in immunocompromised AIDS patients, a combination of pyrimethamine and a sulfa-based drug, either sulfadiazine or clindamycin (Cleocin), have been used together and can be effective in treating this disease. Other antibiotic combinations and dosing schedules are still being investigated. Physicians have reported success in alleviating symptoms by using trimethoprim-sulfamethoxazole (Proloprim or Trimpex) or dapsone (DDS) plus pyrimethamine. These drugs can produce side effects, such as allergic reaction, **itching**, **rashes**, and nausea; and patients must be monitored closely.

Prognosis

The prognosis is poor when congenital toxoplasmosis is acquired during the first three months of pregnancy. Afflicted children die in infancy or suffer damage to their central nervous systems that can result in physical and **mental retardation**. Infection later in pregnancy usually results in only mild symptoms, if any. The prognosis for acquired toxoplasmosis in adults with strong immune systems is excellent. The disease often disappears by itself after several weeks. However, the prognosis for immunodeficient patients is not as positive. These patients often relapse when treatment is stopped. The disease can be fatal to all immunocompromised patients, especially AIDS patients, and particularly if not treated. As a result, immunocompromised patients are typically placed on anti-toxoplasmosis drugs for the rest of their lives.

Prevention

There are no drugs that can eliminate *T. gondii* cysts in animal or human tissues. Humans can reduce their risks of developing toxoplasmosis by practicing the following:

- freezing (to 10.4°F/-12°C) and cooking foods to an internal temperature of 152°F/67°C will kill the cysts
- practicing sanitary kitchen techniques, such as washing utensils and cutting boards that come into contact with raw meat
- keeping pregnant women and children away from household cats and cat litter
- disposing of cat feces daily, because the oocysts do not become infective until after 24 hours
- helping cats to remain free of infection by feeding them dry, canned, or boiled food and by discouraging hunting and scavenging
- washing hands after outdoor activities involving soil contact and wearing gloves when gardening

Resources

BOOKS

- Conn's Current Therapy*, 1996. Ed. Robert E. Rakel. Philadelphia: W. B. Saunders Co., 1996.
- The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.
- Shulman, Stanford T., et al. *The Biologic and Clinical Basis of Infectious Diseases*. 5th ed. Philadelphia: W. B. Saunders Co., 1997.
- Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

PERIODICALS

- Alger, L. S. "Toxoplasmosis and Parvovirus B19." *Infectious Disease Clinics of North America* 11 (Mar. 1997): 55-75.

KEY TERMS

Cyst—The thick-walled dormant form of many organisms.

Immunocompromised—A state in which the immune system is suppressed or not functioning properly.

Oocyst—The egg form of the toxoplasmosis organism.

Protozoan—A single-celled, usually microscopic, organism.

Campagna, A. C. "Pulmonary Toxoplasmosis." *Seminars in Respiratory Infections* 12 (June 1997): 98-105.

Rose, I. "Morphology and Diagnostics of Human Toxoplasmosis." *General & Diagnostic Pathology* 142 (June 1997): 257-70.

Maury M. Breecher, PhD

Toxoplasmosis, Other, Rubella,
Cytomegalovirus, Herpes simplex test see
TORCH test

T-PA see **Thrombolytic therapy**

Trabeculectomy

Definition

Trabeculectomy is a surgical procedure that removes part of the trabeculum in the eye to relieve pressure caused by **glaucoma**.

Purpose

Glaucoma is a disease that injures the optic nerve, causing progressive loss of vision. Presently, glaucoma is a major cause of blindness in the United States. If caught early, glaucoma-related blindness is easily prevented. However, since it does not produce symptoms until late in its cycle, periodic tests for the disease are necessary.

Glaucoma is usually associated with an increase in the pressure inside the eye. This increase occurs in front of the iris in a fluid called the aqueous humor. Aqueous humor is supposed to exit through tiny channels between the iris and the cornea, in an area called the trabeculum.

KEY TERMS

Cornea—Transparent film that covers the iris and pupil.

Iris—Colored part of the eye, which is suspended in aqueous humor and perforated by the pupil.

Sclera—White, outer coating of the eyeball.

Trabeculoplasty—Laser surgery that creates perforations in the trabeculum, to drain built up aqueous humor and relieve pressure.

Trabeculum—Tissue that is a drainage point for aqueous humor in the eye.

When the trabeculum is blocked, pressure from the build up of aqueous humor either increases rapidly with considerable **pain** and redness, or, as in most cases, the pressure builds slowly with no symptoms until much of the vision is lost. Trabeculectomy is the last treatment employed for either type of glaucoma. It is used only after medications and laser trabeculoplasty (less invasive procedure that uses a laser to open the blocked trabeculum) have failed to alleviate the pressure.

Description

A trabeculectomy involves removing a tiny piece of the eyeball right at the place where the cornea connects to the sclera (the white part), and creating a flap to allow fluid to escape the anterior chamber without deflating the eye. Along with that tiny piece of cornea and sclera comes a piece of the iris. The whole area is called the trabeculum. Fluid can then flow out onto the surface of the eye and be absorbed by the conjunctiva, the transparent membrane that lines the sclera and the eyelids. Sometimes, an additional piece is taken out of the iris so that anterior chamber fluid can also flow backward into the vitreous part of the eye. This procedure is called an iridectomy.

Preparation

The procedure and its benefits and possible complications are fully explained. Antiglaucoma drugs are prescribed before surgery. Added pressure on the eye caused from coughing or sneezing should be avoided.

Aftercare

Eye drops, and perhaps patching, will be needed until the eye is healed. The pressure inside the eye will

still be monitored. Immediately following the procedure, the patient may experience blurred vision.

Risks

Infection and bleeding are risks of any surgery. Scarring can cause the drainage to stop. A third of patients with trabeculectomies will develop **cataracts**.

Resources

BOOKS

General Ophthalmology. 13th ed. Ed. Daniel Vaughan. Stamford: Appleton & Lange, 1993.

Sardegna, Jill, and T. Paul Otis. *The Encyclopedia of Blindness and Vision Impairment*. New York: Facts on File, Inc., 1990.

J. Ricker Polsdorfer, MD

Tracheoesophageal fistula

Definition

Tracheoesophageal fistula (TEF) is commonly a birth defect, with the trachea connected to the esophagus. In most cases, the esophagus is discontinuous, causing immediate feeding difficulties. TEFs may develop in adult life, secondary to the invasion of **cancer** in the area. In addition, TEFs may be deliberately constructed with surgery to aid talking in a patient who has the larynx removed (a **laryngectomy**).

Description

The trachea, or windpipe, carries air to the lungs. The esophagus carries food to the stomach. Sometimes during development, these two tubes do not separate completely, but remain connected by a short passage. When this happens, air enters the gastrointestinal system, causing the bowels to distend, and mucus is breathed into the lungs causing aspiration **pneumonia** and breathing problems.

Most tracheoesophageal fistulas are diagnosed when a child is born. There are three types. In 85–90% of tracheoesophageal fistulas, the top part of the esophagus ends in a blind sac, and the lower part inserts into the trachea. In the second type, the upper part of the esophagus is connected directly to the trachea, while the lower part ends in a pouch. In a rare type of fistula called an H type, both the esophagus and trachea are complete, but they are connected. This is the most difficult type of tracheoesophageal fistula to diagnose, because both eating and breathing are possible.

Causes and symptoms

Tracheoesophageal fistulas arise as a developmental abnormality. At birth, the infant has difficulty swallowing. Eating produces severe coughing spells that interfere with breathing. Aspiration pneumonia can develop from fluid breathed into the lungs.

Small H type fistulas may go undiagnosed until later in life. Symptoms of an H type fistula include frequent pulmonary infections and bouts of abdominal bloating.

Diagnosis

Diagnosis that the esophagus is interrupted is confirmed by the inability to insert a **nasogastric suction** tube into the stomach. The exact type and location of the fistula can be determined using a radiopaque catheter, which allows pictures to be taken of the esophagus. X rays may show air in the bowels. Endoscopy often fails to locate the fistula if it is small.

Treatment

Babies with all but H type fistulas are unlikely to survive without surgical separation and repair of the trachea and the esophagus. Surgery cannot always be performed immediately because of **prematurity**, the presence of other **birth defects**, or complications from aspiration pneumonia. It is usually done at a hospital that has special facilities for treating seriously ill newborns.

While awaiting surgery, the infant's condition is stabilized. Preoperative care concentrates on avoiding aspiration pneumonia and includes:

- elevating the head to avoid reflux and aspiration of the stomach contents
- using a suction catheter to continuously remove mucus and saliva that could be inhaled
- when necessary, placement of a **gastrostomy** tube
- withholding feeding by mouth

When surgery is performed, the esophagus is reconnected to make it continuous and separate from the trachea. If the two ends of the esophagus are too far apart to be reattached, a piece of tissue from the large intestine is used to join the parts.

Prognosis

Infants who have tracheoesophageal fistula often have other birth defects that affect their recovery. Even when the esophagus is successfully separated and reattached, many infants have difficulty swallowing, because the contractility of the esophagus is impaired. Infants

KEY TERMS

Endoscopy—A procedure in which an instrument containing a camera and a light source is inserted into the gastrointestinal tract so that the physician can visually inspect the gastrointestinal system.

Gastrostomy tube—Stomach tube for feeding.

Laryngectomy—Surgical removal of the larynx to treat cancer.

may also have problems with gastroesophageal reflux, in which the acidic contents of the stomach back up into the bottom of the esophagus and cause ulcers and scarring.

Prevention

Tracheoesophageal fistulas are not preventable birth defects.

Resources

BOOKS

"Gastrointestinal Defects." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

Tish Davidson

Tracheostomy see **Tracheotomy**

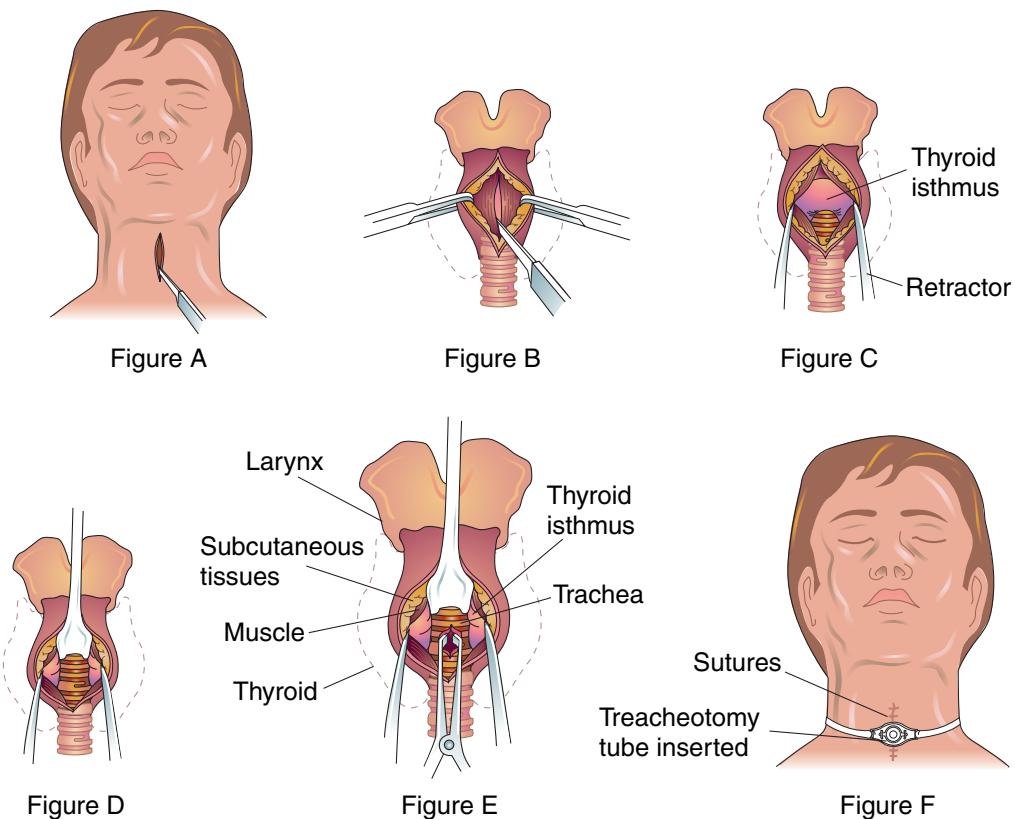
Tracheotomy

Definition

A tracheotomy is a surgical procedure in which a cut or opening is made in the windpipe (trachea). The surgeon inserts a tube into the opening to bypass an obstruction, allow air to get to the lungs, or remove secretions. The term tracheostomy is sometimes used interchangeably with tracheotomy. Strictly speaking, however, tracheostomy usually refers to the opening itself while a tracheotomy is the actual operation.

Purpose

A tracheotomy is performed if enough air is not getting to the lungs, if the person cannot breathe without help, or is having problems with mucus and other secretions get-



Tracheotomy is a surgical procedure in which an opening is made in the windpipe or trachea. As shown in the illustration above, the physician or surgeon will follow these steps in performing this procedure: Figure A: A vertical incision is made through the skin. Figure B: Another incision is made through the subcutaneous tissues and muscles of the neck. Figure C: The neck muscles are separated using retractors. Figure D: The thyroid isthmus is either cut or retracted. Figure E: The surgeon identifies the rings of cartilage that make up the trachea and cuts into the walls. Figure F: A metal or plastic tube is inserted into the opening and sutures are used to hold the tube in place. (Illustration by Electronic Illustrators Group.)

ting into the windpipe because of difficulty swallowing. There are many reasons why air cannot get to the lungs. The patient's windpipe may be blocked by a swelling; by a severe injury to the neck, nose or mouth; by a large foreign object; by **paralysis** of the throat muscles; or by a tumor. The patient may be in a **coma**, or need a ventilator to pump air into the lungs for a long period of time.

Precautions

Doctors perform emergency tracheotomies as last-resort procedures. They are done only if the patient's windpipe is obstructed and the situation is life-threatening.

Description

Emergency tracheotomy

There are two different procedures that are called tracheotomies. The first is done only in emergency situations

and can be performed quite rapidly. The emergency room physician or surgeon makes a cut in a thin part of the voice box (larynx) called the cricothyroid membrane. A tube is inserted and connected to an oxygen bag. This emergency procedure is sometimes called a cricothyroidotomy.

Nonemergency tracheotomy

The second type of tracheotomy takes more time and is usually done in an operating room. The surgeon first makes a cut (incision) in the skin of the neck that lies over the trachea. This incision is in the lower part of the neck between the Adam's apple and top of the breastbone. The neck muscles are separated and the thyroid gland, which overlies the trachea, is usually cut down the middle. The surgeon identifies the rings of cartilage that make up the trachea and cuts into the tough walls. A metal or plastic tube, called a tracheotomy tube, is inserted through the opening. This tube acts like a windpipe and allows the

person to breathe. Oxygen or a mechanical ventilator may be hooked up to the tube to bring oxygen to the lungs. A dressing is placed around the opening. Tape or stitches (sutures) are used to hold the tube in place.

After a nonemergency tracheotomy, the patient usually stays in the hospital for three to five days, unless there is a complicating condition. It takes about two weeks to recover fully from the surgery.

Preparation

Emergency tracheotomy

In the emergency tracheotomy, there is no time to explain the procedure or the need for it to the patient. The patient is placed on his or her back with face upward (supine), with a rolled-up towel between the shoulders. This positioning of the patient makes it easier for the doctor to feel and see the structures in the throat. A local anesthetic is injected across the cricothyroid membrane.

Nonemergency tracheotomy

In a nonemergency tracheotomy, there is time for the doctor to discuss the surgery with the patient, to explain what will happen and why it is needed. The patient is then put under general anesthesia. The neck area and chest are then disinfected as preparation for the operation, and surgical drapes are placed over the area, setting up a sterile field.

Aftercare

Postoperative care

A **chest x ray** is often taken, especially in children, to check whether the tube has become displaced or if complications have occurred. The doctor may prescribe **antibiotics** to reduce the risk of infection. If the patient can breathe on their own, the room is humidified; otherwise, if the tracheotomy tube is to remain in place, the air entering the tube from a ventilator is humidified. During the hospital stay, the patient and his or her family members will learn how to care for the tracheotomy tube, including suctioning and clearing it. Secretions are removed by passing a smaller tube (catheter) into the tracheotomy tube.

It takes most patients several days to adjust to breathing through the tracheotomy tube. At first, it will be hard even to make sounds. If the tube allows some air to escape and pass over the vocal cords, then the patient may be able to speak by holding a finger over the tube. A patient on a ventilator will not be able to talk at all.

The tube will be removed if the tracheotomy is temporary. Then the wound will heal quickly and only a small scar may remain. If the tracheotomy is permanent,

the hole stays open and, if it is no longer needed, it will be surgically closed.

Home care

After the patient is discharged, he or she will need help at home to manage the tracheotomy tube. Warm compresses can be used to relieve **pain** at the incision site. The patient is advised to keep the area dry. It is recommended that the patient wear a loose scarf over the opening when going outside. He or she should also avoid contact with water, food particles, and powdery substances that could enter the opening and cause serious breathing problems. The doctor may prescribe pain medication and antibiotics to minimize the risk of infections. If the tube is to be kept in place permanently, the patient can be referred to a speech therapist in order to learn to speak with the tube in place. The tracheotomy tube may be replaced four to 10 days after surgery.

Patients are encouraged to go about most of their normal activities once they leave the hospital. Vigorous activity is restricted for about six weeks. If the tracheotomy is permanent, further surgery may be needed to widen the opening, which narrows with time.

Risks

Immediate risks

There are several short-term risks associated with tracheotomies. Severe bleeding is one possible complication. The voice box or esophagus may be damaged during surgery. Air may become trapped in the surrounding tissues or the lung may collapse. The tracheotomy tube can be blocked by blood clots, mucus, or the pressure of the airway walls. Blockages can be prevented by suctioning, humidifying the air, and selecting the appropriate tracheotomy tube. Serious infections are rare.

Long-term risks

Over time, other complications may develop following a tracheotomy. The windpipe itself may become damaged for a number of reasons, including pressure from the tube; bacteria that cause infections and form scar tissue; or friction from a tube that moves too much. Sometimes the opening does not close on its own after the tube is removed. This risk is higher in tracheotomies with tubes remaining in place for 16 weeks or longer. In these cases, the wound is surgically closed.

High-risk groups

The risks associated with tracheotomies are higher in the following groups of patients:

KEY TERMS

Cartilage—A tough, fibrous connective tissue that forms various parts of the body, including the trachea and larynx.

Cricothyroidotomy—An emergency tracheotomy that consists of a cut through the cricothyroid membrane to open the patient's airway as fast as possible.

Larynx—A structure made of cartilage and muscle that connects the back of the throat with the trachea. The larynx contains the vocal cords.

Trachea—The tube that leads from the larynx or voice box to two major air passages that bring oxygen to each lung. The trachea is sometimes called the windpipe.

Ventilator—A machine that helps patients to breathe. It is sometimes called a respirator.

- children, especially newborns and infants
- smokers
- alcoholics
- obese adults
- persons over 60
- persons with chronic diseases or respiratory infections
- persons taking **muscle relaxants**, sleeping medications, tranquilizers, or cortisone

The overall risk of **death** from a tracheotomy is less than 5%.

Normal results

Normal results include uncomplicated healing of the incision and successful maintenance of long-term tube placement.

Resources

BOOKS

- Fagan, Johannes J., et al. *Tracheotomy*. Alexandria, VA: American Academy of Otolaryngology-Head and Neck Surgery Foundation, Inc., 1997.
- "Neck Surgery." In *The Surgery Book: An Illustrated Guide to 73 of the Most Common Operations*, ed. Robert M. Younson, et al. New York: St. Martin's Press, 1993.
- Schantz, Nancy V. "Emergency Cricothyroidotomy and Tracheostomy." In *Procedures for the Primary Care Physician*, ed. John Pfenninger and Grant Fowler. New York: Mosby, 1994.

OTHER

"Answers to Common Otolaryngology Health Care Questions."

Department of Otolaryngology-Head and Neck Surgery Page. University of Washington School of Medicine.

<<http://weber.u.washington.edu/~otoweb/trach.html>>.

Sicard, Michael W. "Complications of Tracheotomy." *The Bobby R. Alford Department of Otorhinolaryngology and Communicative Sciences*. <<http://www.bcm.tmc.edu/oto/grand/12194.html>>.

Jeanine Barone, Physiologist

Trachoma

Definition

Trachoma, which is also called granular **conjunctivitis** or Egyptian ophthalmia, is a contagious, chronic inflammation of the mucous membranes of the eyes, caused by *Chlamydia trachomatis*. It is characterized by swelling of the eyelids, sensitivity to light, and eventual scarring of the conjunctivae and corneas of the eyes.

Description

Trachoma is a major cause of blindness in the world. It is found in the Far East, as well as countries with desert climates. In the United States, it is most common among certain Native Americans and in parts of Appalachia. The infection is highly contagious in its early stages. Blindness results from recurrent untreated infections.

The conjunctiva is the clear mucous membrane that lines the inside of the eyelid and covers the white part (sclera) of the eye. Conjunctivitis is an inflammation of the conjunctiva.

Causes and symptoms

Trachoma is caused by *C. trachomatis*, a parasitic organism closely related to bacteria. It is transmitted by insects, by hand-to-eye contact, or by the sharing of infected handkerchiefs or towels. The incubation period is about a week.

The early symptoms of trachoma include the development of follicles (small sacs) on the conjunctivae of the upper eyelids, **pain**, swollen eyelids, a discharge, tearing, and sensitivity to light. If the infection is not treated, the follicles develop into large yellow or gray pimples, and small blood vessels develop inside the cornea. In most cases, both eyes are infected.



A close-up of a human eye with trachoma. Trachoma is caused by *Chlamydia trachomatis* and commonly results in blindness if left untreated. (Custom Medical Stock Photo. Reproduced by permission.)

Repeated infections eventually lead to contraction and turning-in of the eyelids, scarring of the corneas and conjunctivae, eventual blockage of the tear ducts, and blindness.

Diagnosis

Diagnosis is based on a combination of the patient's history (especially living or traveling in areas with high rates of trachoma) and examination of the eyes. The doctor will look for the presence of follicles or scarring. He or she will take a small sample of cells from the patient's conjunctivae and examine them, following a procedure called Giemsa staining, to confirm the diagnosis.

Treatment

Treatment of early-stage trachoma consists of four to six weeks of antibiotic treatment with tetracycline, erythromycin, or sulfonamides. Antibiotics should be given without waiting for laboratory test results. Treatment may combine oral medication with antibiotic ointment applied directly to the eyes. A single-dose treatment with azithromycin is an alternative method. Tetracyclines should not be given to pregnant women or children below the age of seven years.

Patients with complications from untreated or repeated infections are treated surgically. Surgery can be used for **corneal transplantation** or to correct eyelid deformities.

Prognosis

The prognosis for full recovery is excellent if the patient is treated promptly. If the infection has progressed to the stage of follicle development, prevention

KEY TERMS

Conjunctivitis—Inflammation of the conjunctivae, which are the mucous membranes covering the white part of the eyeball (sclera) and lining the inside of the eyelids.

Cornea—The transparent front part of the eye that allows light to enter.

Ophthalmia—Inflammation of the eye. Usually severe and affecting the conjunctiva. Trachoma is sometimes called Egyptian ophthalmia.

of blindness depends on the severity of the follicles, the presence of additional bacterial infections, and the development of scarring.

Prevention

There are vaccines available that offer temporary protection against trachoma, but there is no permanent immunization. Prevention depends upon good hygiene and public health measures:

- seek treatment immediately if a child shows signs of eye infection, and minimize his or her contact with other children
- teach children to wash hands carefully before touching their eyes
- protect children from flies or gnats that settle around the eyes
- if someone has trachoma (or any eye infection), do not share towels, pillowcases, etc.; wash items well
- if medications are prescribed, follow the doctor's instructions carefully

Resources

BOOKS

O'Brien, Terrence P. "Conjunctivitis." In *Conn's Current Therapy*, 1996, ed. Robert E. Rakel. Philadelphia: W. B. Saunders Co., 1996.

"Ophthalmologic Disorders: Trachoma." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

Riordan-Eva, Paul, et al. "Eye." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

"Trachoma." In *Professional Guide to Diseases*, ed. Stanley Loeb, et al. Springhouse, PA: Springhouse Corporation, 1991.

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Traction

Definition

Traction is the use of a pulling force to treat muscle and skeleton disorders.

Purpose

Traction is usually applied to the arms and legs, the neck, the backbone, or the pelvis. It is used to treat **fractures**, dislocations, and long-duration muscle spasms, and to prevent or correct deformities. Traction can either be short-term, as at an accident scene, or long-term, when it is used in a hospital setting.

Traction serves several purposes:

- it aligns the ends of a fracture by pulling the limb into a straight position
- it ends muscle spasm
- it relieves pain
- it takes the pressure off the bone ends by relaxing the muscle

There are two main types of traction: skin traction and skeletal traction. Within these types, many specialized forms of traction have been developed to address problems in particular parts of the body. The application of traction is an exacting technique that requires training and experience, since incorrectly applied traction can cause harm.

Positioning the extremity so that the angle of pull brings the ends of the fracture together is essential. Elaborate methods of weights, counterweights, and pulleys have been developed to provide the appropriate force while keeping the bones aligned and preventing muscle spasm. The patient's age, weight, and medical condition are all taken into account when deciding on the type and degree of traction.

Precautions

People who are suffering from skin disorders or who are allergic to tape should not undergo skin traction, because the application of traction will aggravate their condition. Likewise, circulatory disorders or **varicose veins** can be aggravated by skin traction. People with an inflammation of the bone (**osteomyelitis**) should not undergo skeletal traction.

Description

Skin traction

Skin traction uses five- to seven-pound weights attached to the skin to indirectly apply the necessary

pulling force on the bone. If traction is temporary, or if only a light or discontinuous force is needed, then skin traction is the preferred treatment. Because the procedure is not invasive, it is usually performed in a hospital bed.

Weights are attached either through adhesive or non-adhesive tape, or with straps, boots, or cuffs. Care must be taken to keep the straps or tape loose enough to prevent swelling and allow good circulation to the part of the limb beyond the spot where the traction is applied. The amount of weight that can be applied through skin traction is limited because excessive weight will irritate the skin and cause it to slough off.

Specialized forms of skin traction have been developed to address specific problems. Dunlop's traction is used on children with certain fractures of the upper arm, when the arm must be kept in a flexed position to prevent problems with the circulation and nerves around the elbow. Pelvic traction is applied to the lower spine, with a belt around the waist. Buck's skin traction is used to treat knee injuries other than fractures. The purpose of this traction is to stabilize the knee and reduce muscle spasm.

Skeletal traction

Skeletal traction is performed when more pulling force is needed than can be withstood by skin traction; or when the part of the body needing traction is positioned so that skin traction is impossible. Skeletal traction uses weights of 25-40 pounds.

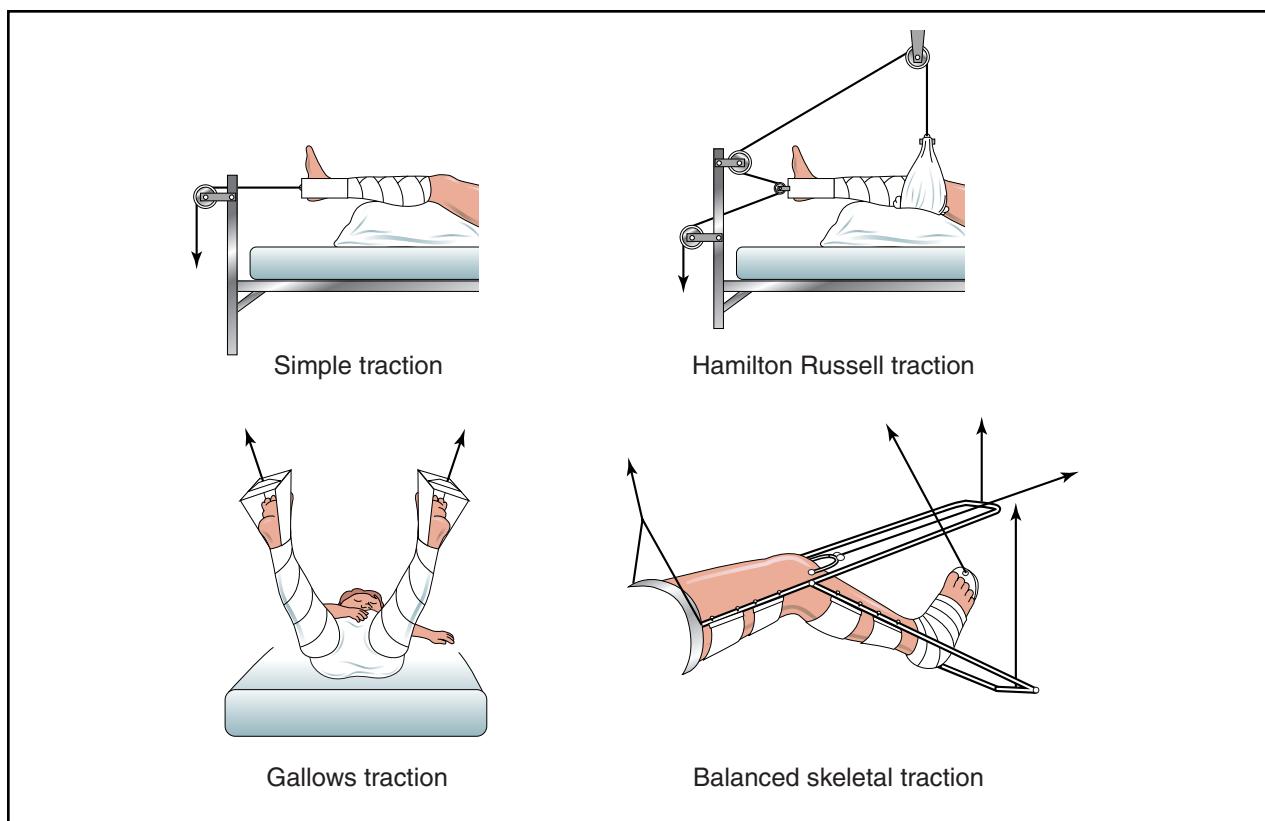
Skeletal traction requires the placement of tongs, pins, or screws into the bone so that the weight is applied directly to the bone. This is an invasive procedure that is done in an operating room under general, regional, or local anesthesia.

Correct placement of the pins is essential to the success of the traction. The pin can be kept in place several months, and must be kept clean to prevent infection. Once the hardware is in place, pulleys and weights are attached to wires to provide the proper pull and alignment on the affected part.

Specialized forms of skeletal traction include cervical traction used for fractures of the neck vertebrae; overhead arm traction used for certain types of upper arm fractures; and tibia pin traction used for some fractures of the femur, hip, or pelvis.

Preparation

X rays are done prior to the application of both forms of traction, and may be repeated during treatment to assure that the affected parts are staying in alignment



Traction refers to the usage of a pulling force and special devices, such as a cast or splint, to treat muscle and skeletal disorders. It is used to treat fractures, dislocations, and long-duration muscle spasms, and to prevent or correct deformities. The illustration above features several commonly used forms of traction. (Illustration by Electronic Illustrators Group.)

and healing properly. Since the insertion of the anchoring devices in skeletal traction is a surgical procedure, standard preoperative blood and urine testing are done, and the patient may meet with an anesthesiologist to discuss any health conditions that might affect the administration of anesthesia.

Aftercare

Aftercare for skin traction involves making sure the limb stays aligned, and caring for the skin so that it does not become sore and irritated. The patient should also be alert to any swelling or tingling in the limb that would suggest that the limb has been wrapped too tightly.

Aftercare for skeletal traction is more complex. The patient is likely to be immobile for an extended period. Deep breathing exercises are taught so that respiratory function is maintained during this time of little activity. Patients are also encouraged to do range-of-motion exercises with the unaffected parts of the body. The patient is taught how to use a trapeze (an overhead support bar) to shift on and off a bedpan, since it is not possible to get up to use the toilet. In serious injuries,

traction may be continued for several months until healing is complete.

Risks

The main risks associated with skin traction are that the traction will be applied incorrectly and cause harm, or that the skin will become irritated. There are more risks associated with skeletal traction. Bone inflammation may occur in response to the introduction of foreign material into the body. Infection can occur at the pin sites. If caught early, infection can be treated with **antibiotics**, but if severe, it may require removal of the pin.

Both types of traction have complications associated with long periods of immobility. These include the development of bed sores, reduced respiratory function, urinary problems, and circulatory problems. Occasionally, fractures fail to heal. Being confined to traction for a long period can take a toll on the patient, also.

Normal results

When correctly applied, traction generally produces very good, if slow, results.

Resources

BOOKS

- Rodrigo, Juan J. "Traction." In *Orthopaedic Surgery: Basic Science and Clinical Science*. Boston: Little, Brown and Co., 1986.
- "Traction." In *Everything You Need to Know About Medical Treatments*. Springhouse, PA: Springhouse Corp., 1996.

Tish Davidson



Traditional Chinese medicine

Definition

Traditional Chinese medicine (TCM) is an ancient and still very vital holistic system of health and healing, based on the notion of harmony and balance, and employing the ideas of moderation and prevention.

Purpose

TCM is a complete system of health-care with its own unique theories of anatomy, health, and treatment. It emphasizes diet and prevention and using **acupuncture**, herbal medicine, massage, and **exercise**; and focuses on stimulating the body's natural curative powers.

Precautions

In situations of severe trauma, TCM should not be substituted for contemporary modern trauma practice; it is most useful as an adjunct to the healing regimen. TCM is not the first line of treatment for bacterial infection or **cancer**, but may usefully complement contemporary medical treatment for those conditions.

Description

In theory and practice, traditional Chinese medicine is completely different from Western medicine, both in terms of considering how the human body works and how illness occurs and should be treated. As a part of a continuing system that has been in use for thousands of years, it is still employed to treat over one-quarter of the world's population. Since the earliest Chinese physicians were also philosophers, their ways of viewing the world and human beings' role in it affected their medicine. In TCM, both philosophically and medically, moderation in all things is advocated, as is living in harmony with nature and striving for balance in all things. Prevention is also a key goal of Chinese medicine, and much emphasis is placed on educating the patient to live responsibly. The

Chinese medicine practitioner preparing herbal medicines.
(Photograph by Eric Nelson. Custom Medical Stock Photo, Inc. Reproduced by permission.)

Chinese physician also is more of an advisor than an authority; he or she believes in treating every patient differently, based on the notion that one does not treat the disease or condition but rather the individual patient. Thus two people with the same complaint may be treated entirely differently, if their constitutions and life situations are dissimilar. Disease is also considered to be evidence of the failure of preventive health care and a falling out of balance or harmony.

There is some confusion in the West about the fundamental philosophical principles upon which traditional Chinese medicine is based — such as the concept of yin and yang, the notion of five elements (wood, fire, earth, metal and water), and the concept of *chi* — yet each can be explained in a way that is understandable to Westerners.

Yin and yang describe the interdependent relationship of opposing but complementary forces believed to be necessary for a healthy life. Basically, the goal is to maintain a balance of yin and yang in all things.

The five elements, or five-phase theory, is also grounded in the notion of harmony and balance. The concept of *chi*, which means something like "life force" or "energy," is perhaps most different from Western ideas. TCM asserts that *chi* is an invisible energy force that flows freely in a healthy person, but is weakened or blocked when a person is ill. Specifically, the illness is a result of the blockage, rather than the blockage being the result of the illness.

Besides these philosophical concepts that differ considerably from infection-based principles of medicine and health, the methods employed by traditional Chinese

medicine are also quite different. If allopathic Western practitioners could be described as interventionist and dependent on synthetic pharmaceuticals, TCM methods are mostly natural and noninvasive. For example, where Western physicians might employ surgery and **chemotherapy** or radiation for a cancer patient, a TCM physician might use acupuncture and dietary changes. TCM believes in “curing the root” of a disease and not merely in treating its symptoms.

Another major difference is how the patient is regarded. In Western medicine, patients with similar complaints or diseases, usually will receive virtually the same treatment. In TCM however, the physician treats the patient and not the condition, believing that identical diseases can have entirely different causes. In terms of the principles upon which it is based and the methods used, traditional Chinese medicine, therefore, is considered by many in the West to be a radically different system of healthcare.

To some in the Western world, this very strangeness is the reason why it might be attractive. To others, tired of what they perceive as their physician’s perfunctory, analytical, and sometimes cold manner, TCM offers a more humane, patient-oriented approach that encourages a high degree of practitioner-patient interaction and is not overly dependent on technology.

For example, during a consultation with a TCM practitioner, the patient will receive a considerable amount of time and attention. During the important first visit, the practitioner will conduct four types of examinations, all extremely observational and all quite different from what patients usually experience.

First, the practitioner will ask many questions, going beyond the typical patient history to inquire about such particulars as eating and bowel habits or sleep patterns. Next, the physician looks at the patient, observing his or her complexion and eyes, while also examining the tongue very closely, believing that it is a barometer of the body’s health and that different areas of the tongue can reflect the functioning of different body organs. After observing, they listen to the patient’s voice or **cough** and then smell his or her breath, body odor, urine, and even bowel movements. Finally, the practitioner touches the patient, palpating his or her abdomen and feeling the wrist to take up to six different pulses. It is through these different pulses that the well-trained practitioner can diagnose any problem with the flow of the all-important *chi*. Altogether, this essentially observational examination will lead the physician to diagnose or decide the patient’s problem. This diagnosis is very different from one in contemporary Western medicine. No blood or urine samples are tested in a laboratory. The

key to this technique lies in the experience and skill of the practitioner.

After making a diagnosis, the physician will suggest a course of treatment from one or all of the available TCM methods. These fall into four main categories: herbal medicine, acupuncture, dietary therapy, and massage and exercise. A typical TCM prescription consists of a complex variety of many different herbal and mineral ingredients. Chinese herbal remedies are intended to assist the body’s own systems so that eventually the patient can stop taking them and never becomes dependent on them. Herbal formulas are usually given as teas, which differ according to the patient.

Other common techniques used in a TCM prescription are as follows:

- Acupuncture is based on the notion that the body’s vital energy force, *chi*, travels through known channels or “meridians.” The acupuncturist inserts tiny, thin sterile needles at particular, selected points on the body to unblock or correct the flow of energy. These needles are hardly felt as they are inserted and are left in place for 15–20 minutes. Some patients report immediate improvement, others feel exhilarated, while some feel like sleeping. In some cases, patients say their condition worsens before it improves. No contemporary scientific explanation exists as to how or why acupuncture works.
- Moxibustion is a variation sometimes employed. Moxibustion is the slow burning on or over the body of special herbal “cones.” These are placed on specific acu-points and provide penetrating, relaxing heat.
- Massage is often recommended, and a deep finger pressure technique known as **acupressure** is often used to promote the proper flow of *chi*.
- Diet is considered essential to good health, and what might be called “kitchen medicine” is just another aspect of herbalism. One example is a delicious *dong quai* black bean soup that is traditionally eaten by women in China after **childbirth** and each menstrual cycle.
- Therapeutic exercises are sometimes prescribed as well. In both the exact and flowing movements of **t’ai chi**, and the breathing techniques of Qi Dong exercise is considered essential to relieving **stress** and promoting the smooth flow of *chi*.

As a system of total healthcare, TCM is prepared to deal with any physical or mental problem, condition, or disease. However, unlike Western medicine at its best, TCM is not able to render the kind of emergency crisis intervention that saves lives during physical traumas. Nonetheless, it works best at achieving its goal of practicing preventive medicine. It has proven effective in treating many types of aches and pains and in helping

KEY TERMS

Allopathic—Pertaining to conventional medical treatment of disease symptoms that uses substances or techniques to oppose or suppress the symptoms.

Anatomy—The science of the body structure of an organism and its parts.

Holistic—That which pertains to the entire person, including the mind, body, and spirit.

Palpate—To examine the body by touching or pressing with the fingers or the palm of the hand.

Pharmaceutical—Pertaining to drugs.

Therapeutic—Curative or healing.

Trauma—Injury or damage to the body.

people with depression and **fatigue**, as well as circulation and digestive problems. Overall, its emphasis on good diet and exercise, as well as on individual responsibility and moderation in all things, suggest that it is grounded in fundamentally sound principles.

Risks

In the hands of a qualified practitioner, TCM is very safe. However, there is a small chance of not only getting an infection from acupuncture, but also that an existing infection could be spread to other parts of the body by increased blood flow and circulation.

Normal results

Traditional Chinese medicine seeks to harmonize and rebalance the entire human system rather than to treat just symptoms. Since proper internal balance is considered to be the key to human health, TCM strives to cure disease by restoring that balance and therefore allowing the body to repair itself. Its continuing medical goal is to detect and correct abnormalities before they cause permanent physical damage.

Resources

BOOKS

- Eckert, Achim. *Chinese Medicine for Beginners*. Rocklin, CA: Prima Publishing, 1996.
- Reid, Daniel. *The Shambhala Guide to Traditional Chinese Medicine*. Boston: Shambhala Publications, Inc., 1996.
- Williams, Tom. *Chinese Medicine*. Rockport, MA: Element Books Ltd., 1995.

Ziyin, Shen, and Chen Zelin. *The Basis of Traditional Chinese Medicine*. Boston: Shambhala Publications, Inc., 1994.

PERIODICALS

Huston, Peter. "China, Chi, and Chicanery." *Skeptical Inquirer* (Sept./Oct. 1995): 38-42, 58.

Light, Louise. "Kitchen Medicine for Women." *Vegetarian Times*, July 1997, 102-106.

Salmons, Catherine A. "Zen and the Art of Healing." *Boston Magazine*, Apr. 1997, 62-65, 95.

ORGANIZATIONS

American Academy of Medical Acupuncture. 2520 Milvia St., Berkeley, CA 94704. (415) 841-3220.

American Association of Acupuncture & Oriental Medicine. 4101 Lake Boone Trail, Suite 201, Raleigh, NC 27607. (919) 787-5181.

Leonard C. Bruno, PhD

Trager psychophysical integration

Definition

Trager psychophysical integration therapy, also known as the Tragerwork system of physical integration, is a combination of hands-on tissue mobilization, relaxation, and movement reeducation called Mentastics. The underlying principle of psychophysical integration is that clients learn to be lighter, easier, and freer by experiencing lightness, ease, and freedom of movement in their bodies.

The Trager method is a psychologically grounded physical approach to muscle relaxation, which is induced when a practitioner and patient achieve a state of mind called hook-up. Hook-up is described as a connection to a state of grace or a powerful and nourishing life force. It is the opposite of strain or effort.

Purpose

Psychophysical integration therapy has been helpful in relieving muscle discomfort in patients afflicted with **polio**, **muscular dystrophy**, **Parkinson's disease**, **multiple sclerosis**, post-stroke trauma, and psychiatric disturbances. The therapy is useful in alleviating such chronic conditions as back and leg **pain**. Athletes may benefit from this system to increase resilience to injuries and to improve their mental attitudes. In addition, the Trager Institute maintains that Tragerwork helps clients achieve greater mental clarity through the release of "deep-seated physical and mental patterns."

MILTON TRAGER (1909–1997)

Milton Trager was a medical doctor and a somatic educator, specializing in body learning. He was a contemporary of F. Matthias Alexander, Moshe Feldenkrais, and Ida Rolf.

As a young man in the 1920s, he occupied himself with gymnastics and boxing. Through his intensely physical pursuits, he arrived at his self-taught body learning theories. The techniques that he nurtured emphasized body control over strength, prowess, and endurance. For example, in striving to leap as high as possible, Trager focused his concentration on landing as softly as possible. He obtained a degree in physical medicine before serving in the military during World War II.

Upon his return, Trager funded his medical school education with his GI benefits. He established a private practice and spent the ensuing 50 years refining his body learning techniques and assisting afflicted individuals in the process. When Trager's father was stricken with sciatic pain, Trager learned to relieve the spasms by hand. In time he learned to alleviate the symptoms of polio victims and others who suffered from muscle spasms.

Trager established the Trager Institute in the 1970s to propagate the techniques that he had developed. By the year 2000, an estimated 2,000 students and practitioners had embraced the Trager Approach.

Trager lived with his wife, Emily, in Southern California at the time of his death in January 1997.

Description

Origins

Psychophysical integration therapy began with Dr. Milton Trager (1909–1997), who earned a medical degree in midlife after working out his approach to healing chronic pain. Trager was born with a spinal deformity and overcame it through practicing a variety of athletic exercises. At the time that he discovered his approach to bodywork, he was training to become a boxer. His therapy came to public attention when Esalen Institute in California, the famous center of the human potential movement, invited him to give a demonstration of his technique during the mid-1970s. Trager abandoned his private medical practice in 1977 to devote full energy to the development and further understanding of psychophysical integration. The Trager Institute, which continues his work, was founded in 1980.

The Trager method consists of two parts, a passive aspect referred to as **tablework** and an active aspect called **Mentastics**, which is a self-care **exercise** program. Although the benefits of the Trager approach are said to

be cumulative, practitioners and clients appear to be free to set their own schedules for a series of sessions. There is no minimum number of sessions that clients must agree to take.

Tablework

The tablework is performed on a comfortable padded table. Sessions last about 60–90 minutes. The practitioner moves the client in ways that he or she naturally moves, in such a way that he or she experiences how it feels to move effortlessly and freely on one's own. The movements resemble general mobilization techniques, and incorporate some manual, cervical, and lumbar **traction**. The goal of tablework is to allow the client "slowly to give up muscular and mental control and sink into a very deep state of relaxation not unlike that experienced in hypnosis."

Mentastics

Mentastics are free-flowing dance-like movements intended to increase the client's self-awareness, as well as providing tools to help the client move through and control chronic pain. The client is encouraged to "let go," which means that they are asked to begin a movement, then release their muscle tension and allow the weight of the body part involved to complete the motion. By experiencing movement as something pleasurable and positive rather than painful or negative, clients begin to loosen up, learn new movements more easily, and even begin inventing their own. In the early stages of treatment, clients are advised to do Mentastic movements at home for 10–15-minute sessions, three times per day.

Preparations

Prior to a session of tablework, the client dresses for comfort, "with a minimum of swimwear or briefs," according to the Trager Institute. The client is also covered with a drape. No oils or lotions are used.

The practitioner prepares for the session by clearing his or her mind of everything but the client, until he or she achieves a state of hook-up. This attitude of "relaxed meditative awareness" on the part of the practitioner is one of the unique features of Tragerwork. It is described as allowing the therapist "to connect deeply with the recipient in an unforced way and enables the practitioner to perceive the slightest responses from the [client's] body."

Precautions

Because of the unusual sensitivity and heightened awareness that is associated with the practitioner's touch, pain should never result from tablework sessions. It is important for clients to alert the practitioner to any pain

KEY TERMS

Hook-up—A state of effortless connection with a life-enhancing force. Trager practitioners enter a state of hook-up before working with clients in order to focus on their needs. Trager himself described hook-up as a meditative process of “becoming one with the energy force that surrounds all living things.”

Mentastics—The active phase of Trager therapy. Mentastics are a form of movement reeducation in which clients learn to reexperience movement as pleasurable and positive.

Tablework—The passive phase of Trager therapy, in which the practitioner uses gentle and noninvasive movements to allow the client to relax deeply and experience physical movement as free and effortless.

associated with either the tablework or the Mentastics program.

Although the movements used in Trager tablework are gentle and noninvasive, clients who have had recent injuries or surgery should wait to heal before undertaking a course of Tragerwork.

Side effects

The Trager method should not produce physical side effects when employed by a qualified practitioner. It is possible that some clients may have emotional reactions associated with the release of physical patterns acquired as a response to trauma, but such reactions are unusual.

Research and general acceptance

Tragerwork, like other forms of bodywork, has gained increasing acceptance as a form of treatment since the 1980s. In 2000 there were 1,200 certified psychophysical integration practitioners in 15 countries worldwide. The therapy has been reported as a commonly employed treatment for mainstream athletes. In addition, the National Institutes of Health lists psychophysical therapy as a mind-body form of complementary alternative medicine.

Resources

BOOKS

- Juhan, Deanne. *Job's Body*. Station Hill Press, 1987.
- Trager, Milton, M.D. *Trager Mentastics: Movements as a Way to Agelessness*. Station Hill Press, 1987.

ORGANIZATIONS

Florida Institute of Psychophysical Integration: Quantum Balance. 5837 Mariner Drive. Tampa, FL 33609-3411. (813) 186-2273. Fax: (813) 287-2870.
Dr.Joy@JohnsonMail.com>.

Trager Institute. 21 Locust Avenue. Mill Valley, CA 94941-2806. (415) 388-2688. Fax: (415) 399-2710. admin@trager.com. <<http://www.trager.com>>.

Gloria Cooksey

Tranquilizers see **Antianxiety drugs**

Transcranial Doppler ultrasonography

Definition

Transcranial **Doppler ultrasonography** is a noninvasive method of analyzing blood flow in the brain.

Purpose

The blood that flows through the brain distributes nutrients to the brain and removes wastes. This flow maintains the high rate of metabolism necessary for the brain to function. Restrictions in blood flow may occur from vessel narrowing (stenosis), clot formation (thrombosis), blockage (**embolism**), or blood vessel rupture (hemorrhage). Lack of sufficient blood flow (**ischemia**) threatens brain tissue and may cause a **stroke**.

The flow of blood through the arteries in the brain can be analyzed using transcranial Doppler ultrasonography (TCD). TCD is a form of ultrasound, in which high frequency sound waves bounce off or pass through body tissues. While most other types of ultrasonography create images of the tissue being studied, the results of TCD are audible sounds that the examiner listens to and records.

Doppler ultrasonography uses what is called the Doppler effect to measure the rate and direction of blood flow in the vessels. Just as a siren's pitch sounds higher when its source is moving toward you and lower as it moves away, so too will ultrasound waves change pitch, or frequency, as they bounce off the red blood cells moving in the blood. It is these pitch changes that produce the audible sounds during the exam.

Changes in frequency can be used to measure both the direction and the speed of blood flow. Faster blood flow causes a greater change in frequency. Combined with other tests, this information can be used to locate restrictions in the blood vessels in the brain, and to track

changes in blood flow over time. In this way, TCD gives valuable information about the site of a stroke and the patient's progress after a stroke. TCD is also used to evaluate the contraction of blood vessels that can occur if a blood vessel ruptures.

Precautions

Ultrasonography procedures are safe, noninvasive, and painless. No special precautions are necessary.

Description

TCD is done with either one or two probes placed against the skin. The examiner spreads a clear gel on the areas of the head where the probe will be placed. Usually, the probes are placed on the temple, on the base of the skull at the back of the neck, and over the closed eyelid. In these places, there is the least amount of thick protective bone and the sound waves can penetrate the best. The examiner adjusts the probe position and orientation to direct the sound waves toward the blood vessels of interest. Finding the best approach may take some time. A compression test may be performed during the exam. In this test, the main artery in the neck (carotid artery) is briefly compressed, and changes in blood flow patterns are observed. A full TCD exam may last 30–45 minutes, and often longer in patients with disease.

Preparation

No special preparation is needed. The patient should remove contact lenses, and may wish to avoid the use of eye makeup, since the gel is likely to smear it.

Aftercare

The gel is washed off with soap and water. No other after care is needed.

Risks

TCD is noninvasive and has no risks. A compression test is occasionally, though very rarely, hazardous for a patient with narrowed arteries (**atherosclerosis**), since the increased pressure may dislodge a piece of the substance that causes the narrowing (plaque).

Normal results

TCD produces an audible sound that varies with the heartbeat. It also varies depending on the direction and rate of flow through the vessel being examined. Each of the vessels in the brain has a characteristic direction of

flow, which can be detected by TCD. Flow rates are somewhat variable from person to person.

Abnormal results

Lack of flow indicates a vessel has been completely blocked (although absence of a signal may also be due to absorption of sound waves by bone). If blood flows in the wrong direction or alternates between normal and reverse flow, it may mean there is a blockage elsewhere. This happens because blood is rerouted due to abnormalities in pressure caused by the blockage.

If the speed of flow is increased, it may mean that blood is flowing through a restricted area that is just "upstream" from the probe. Intuitively, one might think that a restricted blood vessel would cause the speed of blood flow to slow down. However, the opposite is true. This is because the same amount of blood going through a narrower opening must go faster. Increased speed is also seen if a vessel is carrying rerouted blood.

Resources

BOOKS

- Office Practice of Neurology*. Ed. Martin Samuels and Steven Feske. New York: Churchill Livingstone, 1996.
von Reutern, G. M., and H. J. von Budingen. Ultrasound Diagnosis of Cerebrovascular Disease. New York: Georg Thieme Verlag, 1993.

Richard Robinson

Transesophageal echocardiography

Definition

Transesophageal echocardiography is a diagnostic test using an ultrasound device that is passed into the esophagus of the patient to create a clear image of the heart muscle and other parts of the heart. A tube with a device called a transducer is passed down into the patient's throat and into the esophagus (the food tube that connects the mouth to the stomach). The transducer directs ultrasound waves into the heart, and the reflected sound waves picked up by the transducer are translated into an image of the heart.

Purpose

Since the esophagus is right next to the heart, transesophageal echocardiography provides a very clear pic-

ture of the heart. It can provide information on the size of the heart, its pumping strength, and the location and extent of any damage to its tissues. It can detect abnormal tissue growth around the heart valves. It is also good at detecting abnormalities in the pattern of blood flow, such as the backward flow of blood through partly closed heart valves, known as regurgitation or insufficiency. It is especially useful in cases in which conventional echocardiography (a test where the transducer is kept on the patient's chest) cannot offer a good image, such as when the patient is obese or has a thick chest wall. It is useful for monitoring heart function during cardiac surgery and detecting blood clots in the left atrium of the heart.

Precautions

Patients should avoid consuming alcohol for a day or so before the procedure, since alcohol may amplify the effects of the sedative used with the procedure.

Description

Echocardiography creates an image of the heart using ultra-high-frequency sound waves—sound waves that are much too high in frequency to be heard by the human ear. The technique is very similar to ultrasound scanning commonly used to visualize the fetus during pregnancy.

A transesophageal echocardiography examination generally lasts 30–60 minutes. The patient is given a mild sedative and the back of the throat is sprayed with a local anesthetic, in order to suppress the gag reflex. Next, a special viewing tube called an endoscope, containing a tiny transducer, is passed through the mouth and into the esophagus. It is carefully moved until it is positioned directly next to the heart. Essentially a modified microphone, the transducer directs ultrasound waves into the heart, some of which get reflected (or “echoed”) back to the transducer. Different tissues and blood all reflect ultrasound waves differently. These sound waves can be translated into a meaningful image of the heart, which is displayed on a monitor or recorded on paper or tape. The transducer may be moved several times during the test to help doctors get a better view of the heart.

Preparation

The patient may be given a mild sedative before the procedure, and an anesthetic is sprayed into the back of the throat in order to suppress the gag reflex.

Aftercare

After the test, it is important to refrain from eating or drinking until the gag reflex has returned—other-

wise, the patient may accidentally inhale some of the food or beverage. If a sedative has been given, patients should not drive or operate heavy machinery for at least 10–12 hours. They should avoid consuming alcohol for a day or so, since alcohol may amplify the effect of the sedative.

Risks

Transesophageal echocardiography may cause gagging and discomfort when the transducer is passed down into the throat. Patients may also experience **sore throat** for a few days after the test. In rare cases, the procedure may cause bleeding or perforation of the esophagus or an inflammatory condition known as infective **endocarditis**. The patient may have an adverse reaction to the sedative or local anesthetic.

Normal results

A normal transesophageal echocardiogram shows a normal heart structure and the normal flow of blood through the heart chambers and heart valves.

Abnormal results

A transesophageal echocardiogram may show a number of abnormalities in the structure and function of the heart, such as thickening of the wall of the heart muscle (especially the left ventricle). Other abnormalities can include blood leaking backward through the heart valves (regurgitation), or blood clots in the left atrium of the heart.

Resources

BOOKS

Faculty Members of the Yale University School of Medicine.

The Patient's Book of Medical Tests. Boston: Houghton Mifflin Co., 1997.

PERIODICALS

Rose, Verna L. “American College of Cardiology and American Heart Association Address the Use of Echocardiography.” *American Family Physician* 56 (7 Oct. 1997): 1489–90.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>. National Heart, Lung and Blood Institute. P.O. Box 30105, Bethesda, MD 20824-0105. (301) 251-1222. <<http://www.nhlbi.nih.gov>>.

Robert Scott Dinsmoor

Transferrin test see **Iron tests**

KEY TERMS

Endoscope—An instrument used to see and examine the inside of a body cavity or organ.

Gag reflex—A normal reflex consisting of elevation of the palate, retraction of the tongue, and contraction of the throat muscles.

Regurgitation—Backward flow of blood through a partly closed valve.

Transducer—A device that converts electrical signals into ultrasound waves and ultrasound waves back into electrical impulses.

Ultrasound—Sound waves at a frequency of 20,000 kHz, often used for diagnostic imaging.

into the veins (intravenous infusion) so that medical personnel can observe the patient for signs of adverse reactions. People who have received many transfusions can develop an immune response to some factors in foreign blood cells (see below). This immune reaction must be checked before giving new blood. Infectious diseases can also be transmitted through donated blood.

Description

Either whole blood or blood components can be used for transfusion. Whole blood is used exactly as it was received from the donor. Blood components are parts of whole blood, such as red blood cells (RBCs), plasma, platelets, clotting factors, immunoglobulins, and white blood cells. Whole blood is used only when needed or when components are not available. Most of the time whole blood is not used because the patient's medical condition can be treated with a blood component. Too much whole blood can raise a recipient's blood pressure. High blood pressure can have medical side effects and should be avoided. Use of blood components is a more efficient way to use the blood supply, because blood that has been processed (fractionated) into components can be used to treat more than one person.

Whole blood is generally used when a person has lost a lot of blood. Such blood loss can be caused by injury or surgical procedures. Whole blood is given to help restore the blood volume, which is essential for maintaining blood pressure. Whole blood is also given to ensure that the body's tissues are receiving enough oxygen. Whole blood is occasionally given when a required blood component is unavailable in isolated form.

Red blood cells are the blood component most frequently used for transfusion. RBCs are the only cells in the body that transport oxygen. A transfusion of RBCs increases the amount of oxygen that can be carried to the tissues of the body. RBCs that have been separated from the liquid plasma (packed RBCs) are given to people who have anemia or who have lost a lot of blood. Platelets are another component frequently given by transfusion. Platelets are a key factor in blood clotting. The clear fluid that carries blood cells (plasma) also contains blood-clotting factors. The platelets and plasma clotting factors are extracted from donated blood and concentrated for use. These factors are used to treat people with such clotting disorders, as **hemophilia**. Immunoglobulins, also called gamma globulin or immune serum, are collected from plasma for use in temporarily boosting the immune capability of a patient. White blood cells (WBCs) are another infection-fighting component of the blood. White blood cells are given by transfusion only rarely.

Transfusion

Definition

The process of transferring whole blood or blood components from one person (donor) to another (recipient).

Purpose

Transfusions are given to restore lost blood, to improve clotting time, and to improve the ability of the blood to deliver oxygen to the body's tissues.

Precautions

For donors, the process of giving blood is very safe. Only sterile equipment is used and there is no chance of catching an infection from the equipment. There is a slight chance of infection at the puncture site if the skin is not properly washed before the collection needle is inserted. Some donors feel light-headed upon standing for the first time after donating. Occasionally, a donor will faint. Donors are advised to drink lots of liquids to replace the fluid lost with the donated blood. It is important to maintain the fluid volume of the blood so that the blood pressure will remain stable. Strenuous **exercise** should be avoided for the rest of the day. Most patients have very slight symptoms or no symptoms at all after donating blood.

For recipients, a number of precautions must be taken. The blood given by transfusion must be matched with the recipient's blood type. Incompatible blood types can cause a serious adverse reaction (transfusion reaction). Blood is introduced slowly by gravity flow directly

Blood donation

Each year in the United States, about 14,000,000 pints of blood are donated. Blood collection is strictly regulated by the Food and Drug Administration (FDA). The FDA has rules for the collection, processing, storage, and transportation of blood and blood products. In addition, the American Red Cross, the American Association of Blood Banks, and most states have specific rules for the collection and processing of blood. The main purpose of regulation is to ensure the quality of blood and to prevent the transmission of infectious diseases through donated blood. Before blood and blood products are used, they are extensively tested for such infectious agents as hepatitis and AIDS.

DONORS. Blood donors are questioned about their general health, their lifestyle, and any medical conditions that might disqualify them as donors. These conditions include hepatitis, AIDS, **cancer**, heart disease, **asthma**, **malaria**, bleeding disorders, and high blood pressure. Screening prevents blood donation by people who could transmit diseases or by people whose medical condition would place them at risk if they donated blood. Some geographical areas or communities have a high rate of hepatitis or AIDS. Blood collection in most of these areas has been discontinued.

The blood pressure, temperature, and pulse of donors are taken to ensure that they are physically able to donate blood. One pint (450 ml) of blood is usually donated, although it is possible to donate smaller volumes. The average man has 10-12 pints and the average woman 8-9 pints of blood. Within hours after donating, most people have replaced the fluid lost with the donated blood, bringing their blood volume back to normal. Replacing donated blood cells and platelets can take several weeks. People with low blood pressure or anemia and pregnant women should not donate blood or should limit the amount of blood they donate. Generally, people are allowed to donate blood only once every two months. This delay ensures the health of the donor and discourages people from selling their blood. The practice of paying donors for blood has essentially stopped. Donors who sell blood tend to have a high risk for the transmission of infectious agents.

BLOOD COLLECTION. Blood is collected from the donor by inserting a large needle into a vein in the arm. Usually, one of the larger veins near the inside of the elbow is used. A tourniquet is placed on the upper arm to increase the pressure in the arm veins and make them swell and become more accessible. Once a suitable vein is identified, the area where the needle will be inserted is sterilized by washing with soap solution or an iodine-containing antiseptic. Sometimes both are used. The

donor lies on a bed or cot during the procedure, which takes about ten minutes. Generally, an 18-gauge needle is used. This needle can easily fit into the veins and yet is large enough that the blood flows easily. Blood will sometimes clot in a smaller needle and stop flowing. Blood is collected in sterile plastic bags that hold one pint (450 ml). The bags contain an anticoagulant to prevent clotting and preservatives to keep the blood cells alive. Properly handled and refrigerated, whole blood can last for 42 days.

AUTOLOGOUS TRANSFUSION. Autologous transfusion is a procedure in which patients donate blood for their own use. Patients who are to undergo surgical procedures for which a blood transfusion might be required may elect to donate a store of blood for the purpose ahead of time. The blood is stored at the hospital for the exclusive use of the patient. This procedure assures that the blood type is an exact match. It also assures that no infection will be transmitted through the blood transfusion.

DIRECTED DONATION. Directed donors are family or friends of the patient who needs a transfusion. Some people think that family and friends provide a safer source of blood than the general blood supply. Studies do not show that directed donor blood is any safer. Blood that is not used for the identified patient becomes part of the general blood supply.

APHERESIS. Apheresis is a special procedure in which only the necessary components of a donor's blood are collected. The remaining components are returned to the donor. A special blood-processing instrument is used in apheresis. It separates the blood into components, saves the desired component, and pumps all the other components back into the donor. Because donors give only part of their blood, they can donate more frequently. For example, people can give almost ten times as many platelets by apheresis as they could give by donating whole blood.

BLOOD PROCESSING. A sample of the donator's blood is collected at the time of donation and tested for infectious diseases. Blood is not used until the results from these tests confirm that it is safe.

BLOOD TYPING. The donated blood is typed. There are major and minor blood types, also called blood groups. The major types are classified by the ABO system. This system groups blood by two substances, called antigen A and antigen B, in the red blood cells. The four ABO blood types are A, B, AB, and O. Type A blood has the A antigen, type B has the B antigen, type AB has both, and type O has neither. These four types of blood are further sorted by the Rh

factor. The Rh, or rhesus factor, is also an antigen in the red blood cells. A person who has the Rh factor is Rh positive; a person who does not have the factor is Rh negative. If a person has red blood cells with both the B and the Rh antigens, that person is said to have a B positive (B+) blood type. Blood types determine what blood a patient can receive. Generally, patients are limited to receiving only blood of the exact same ABO and Rh type as their own. For example, a person with B+ blood can only receive blood or blood cells from another person with B+ blood. An exception is blood type O. O is called the universal donor, because people of all blood types can accept it.

Blood can be typed by several other minor antigens, such as Kell, Duffy, and Lewis. These minor antigens can become important when a patient has received many transfusions. These patients tend to build up an immune response to the minor blood groups that do not match their own. Upon receiving a transfusion with a mismatched minor blood group, they may have an adverse reaction. A third group of antigens to which a patient can react are residues from the donor's plasma that have attached to the RBCs. To eliminate this problem, the RBCs are rinsed to remove plasma residues. These rinsed cells are called washed RBCs.

Blood components used in transfusion

Most blood collected from donors is broken down (fractionated) into components that are used to treat specific problems or diseases. Treating patients with blood components is the most efficient way to use the blood supply.

RED BLOOD CELLS. Red blood cells (RBCs) carry oxygen throughout the body. They obtain oxygen as they pass through the lungs and give up oxygen to the other tissues of the body as they are pumped through arteries and veins. When patients do not have enough RBCs to properly oxygenate their bodies, they can be given a transfusion with RBCs obtained from donors. RBCs are recovered from whole blood after donation. They are then typed, removed from the watery blood plasma to minimize the volume (packed), and stored. They are given to people who have anemia (including **thalassemia**), whose bone marrow does not make enough RBCs, or who have other conditions that decrease the number of RBCs in the blood. Occasionally, red blood cells from rare blood types are frozen. Once frozen, RBCs can survive for as long as ten years. Packed RBCs are given in the same manner as whole blood.

PLASMA. Plasma is the liquid portion of blood. It contains many useful proteins, especially clotting factors and immunoglobulins. After they are processed,

plasma or plasma factors (fractions) are usually frozen. Some plasma fractions are freeze-dried. These fractions include clotting factors I through XIII. Some people have an inherited disorder in which the body produces too little of the plasma clotting factors VIII (hemophilia A) or IX (hemophilia B). Transfusions of these clotting factors help people with hemophilia stop bleeding. Frozen plasma must be thawed before it is used and freeze-dried plasma must be mixed with liquid (reconstituted). In both cases, these blood fractions are usually small in volume and can be injected by syringe and needle.

PLATELETS. Platelets are small bodies in the blood that are essential for clotting. People who do not have enough platelets have bleeding problems. People who have lymphoma, leukemia, or **thrombocytopenia**, and people who are receiving cancer therapy do not make enough platelets. Platelets have a very short shelf life; they must be used within five days of blood donation. Platelets are packed into bags. A platelet transfusion is given in the same manner as whole blood.

IMMUNOGLOBULINS. Immunoglobulins are the infection-fighting fraction of blood plasma. They are also known as gamma globulin, antibodies, and immune serum. This blood fraction is given to people who have difficulty fighting infections, especially people whose immune systems are depressed by diseases, such as AIDS. Immunoglobulins are also used to prevent **tetanus** after cuts, to treat animal bites when **rabies** infection is suspected, or to treat severe childhood diseases. Generally, the volume used is small, and the immunoglobulins can be injected.

WHITE BLOOD CELLS. White blood cells (WBCs) are another infection-fighting component of the blood. On rare occasions, white blood cells are given by transfusion to treat life-threatening infections. Such transfusions are given when the WBC count is very low or when WBCs are not functioning normally. Most of the time, however, **antibiotics** are used in these cases.

Preparation

A person receiving a transfusion is treated in much the same way as a blood donor. The site where the needle will be inserted is carefully washed with a soap-based solution, followed by an iodine-containing antiseptic. The skin is then dried and the transfusion needle inserted into the recipient's vein. During the early stages of a transfusion, the recipient is monitored closely to detect any adverse reactions. If no signs of adverse reaction are evident, the patient is monitored occasionally for the duration of the transfusion period. Upon completion of

the transfusion, a compress bandage is placed over the needle-insertion site to prevent bleeding.

Aftercare

Recipients of blood transfusion are monitored during and after the transfusion for signs of adverse reaction.

Risks

Adverse reaction to mismatched blood (transfusion reaction) and transmission of infectious disease are the two major risks of blood transfusion. Transfusion reaction occurs when antibodies in the recipient's blood react to foreign blood cells introduced by the transfusion. The antibodies bind to the foreign cells and destroy them (hemolytic reaction). Transfusion reaction may also cause a hypersensitivity of the immune system that, in turn, may cause tissue damage within the patient's body. The patient may also have an allergic reaction to mismatched blood. The first symptoms of transfusion reaction are a feeling of general discomfort and **anxiety**. Breathing difficulties, flushing, a sense of pressure in the chest, and back **pain** may develop. Evidence of a hemolytic reaction can be seen in the urine, which will be colored from the waste of destroyed red blood cells. Severe hemolytic reactions are occasionally fatal. Reactions to mismatches of minor factors are milder. These symptoms include itchiness, **dizziness**, **fever**, **headache**, rash, and swelling. Sometimes the patient will experience breathing difficulties and muscle spasms. Most adverse reactions from mismatched blood are not life-threatening. The infectious diseases most often acquired from blood transfusion in the United States are hepatitis and AIDS.

Patients who are given too much blood can develop high blood pressure, a concern for people who have heart disease. Very rarely, an air **embolism** is created when air is introduced into a patient's veins through the tubing used for intravenous infusion. The danger of embolism is greatest when infusion is begun or ended. Care must be taken to ensure that all air is bled out of the tubing before infusion begins, and that infusion is stopped before air can enter the patient's blood system.

Resources

BOOKS

- Berkow, Robert, ed. *Merck Manual of Medical Information*. Whitehouse Station, NJ: Merck Research Laboratories, 1997.
- Beutler, Ernest, ed., et al. *Williams Hematology*. 5th ed. New York: McGraw-Hill, Inc., 1995.
- Larsen, D. E., ed. *Mayo Clinic Family Health Book*. New York: William Morrow and Co., Inc., 1996.

John T. Lohr, PhD

KEY TERMS

ABO blood groups—A system in which human blood is classified by whether the red blood cells contain A or B antigens. Type A blood has the A antigen; type B has the B antigen, AB has both, and O has neither.

Antibody—A simple protein produced by the body to destroy bacteria, viruses, or other foreign bodies. Production of each antibody is triggered by a specific antigen.

Antigen—A substance that stimulates the immune system to manufacture antibodies (immunoglobulins). The function of antibodies is to fight off intruder cells, such as bacteria or viruses, in the body. Antigens stimulate the blood to fight other blood cells that have the wrong antigens. If a person with blood type A is given a transfusion with blood type B, the A antigens will fight the foreign blood cells as though they were an infection.

Immunoglobulin—An antibody.

Infusion—Introduction of a substance directly into a vein or tissue by gravity flow.

Injection—Forcing a fluid into the body by means of a needle and syringe.

Rh (rhesus) factor—An antigen present in the red blood cells of 85% of humans. A person with Rh factor is Rh positive (Rh+); a person without it is Rh negative (Rh-). The Rh factor was first identified in the blood of a rhesus monkey.

Transhepatic biliary catheterization

Definition

Transhepatic biliary catheterization is a surgical procedure during which a catheter is inserted into the bile duct to relieve an obstruction.

Purpose

Bile is a fluid made in the liver and stored in the gall bladder. The function of bile is to break down fats during digestion. When fatty foods move into the intestine, bile is released from the gall bladder, travels through the bile duct, and enters the first part of the small intestine (duodenum).

If the bile duct is blocked, the skin becomes yellowish (jaundiced), the abdomen is painful, and a **fever** develops. The bile duct can be blocked by **gallstones**, surgical injury, infection in the duct, or by tissue growth due to **cancer**. Transhepatic biliary catheterization is performed to relieve bile duct blockage. The most common reason for this procedure is to relieve obstruction from the overgrowth of cancer cells. Obstruction due to gallstones is usually cleared by other means.

Precautions

Transhepatic biliary catheterization is done when cancer has progressed to the point where all the malignant cells cannot be removed by surgery. Patients who need transhepatic biliary catheterization often suffer from additional complications of their cancer. Because of the likelihood of bleeding from the liver, this procedure should not be done on patients who have blood clotting abnormalities.

Description

Transhepatic biliary catheterization is performed by inserting a needle through the skin, into the abdomen, through the liver, and into the bile duct. A wire attached to the needle then guides the catheter into place. The procedure can take several hours. The patient is given medication for **pain**.

The catheter can either reestablish bile flow into the duodenum or reroute the bile so it drains into a bag outside the body. The choice depends on the extent and position of the obstruction.

Preparation

The standard preoperative blood tests are performed. The patient should not eat or drink the day of the procedure.

Aftercare

The patient must stay in bed after the procedure for at least six hours, to reduce the risk of bleeding. A nurse checks vital signs and looks for indications of complication such as pain, cramping, or leakage around the catheter. The catheter is flushed periodically to keep it open. Patient and caregiver education on how to keep the catheter clean and irrigated is an important part of aftercare.

Risks

The most common complication of transhepatic biliary catheterization is bleeding as a result of puncturing the liver. Infection may also result from this procedure. Sometimes the catheter itself becomes blocked and is ineffective.

Normal results

Transhepatic biliary catheterization is a treatment, not a cure. Successful treatment relieves the blocked bile duct, but does not change the underlying conditions that caused the blockage.

Resources

BOOKS

"Insertion of a Catheter to Relieve Bile Duct Obstruction." In *Everything You Need to Know About Medical Treatments*. Springhouse, PA: Springhouse Corp., 1996.

ORGANIZATIONS

National Cancer Institute. Building 31, Room 10A31, 31 Center Drive, MSC 2580, Bethesda, MD 20892-2580. (800) 422-6237. <<http://www.nci.nih.gov>>.

OTHER

"Extrahepatic Bile Duct Cancer." *National Cancer Institute Page*. <<http://www.nci.nih.gov>>.

Tish Davidson

Transient ischemic attack

Definition

A transient ischemic attack, or TIA, is often described as a mini-stroke. Unlike a **stroke**, however, the symptoms can disappear within a few minutes. TIAs and strokes are both caused by a disruption of the blood flow to the brain. In TIAs and most strokes, this disruption is caused by a blood clot blocking one of the blood vessels leading to the brain. The blockage produces symptoms such as sudden weakness or numbness on one side of the body, sudden dimming or loss of vision, and difficulty speaking or understanding speech. If the symptoms are caused by a TIA, they last less than 24 hours and do not cause brain damage. Stroke-associated symptoms, on the other hand, do not go away and may cause brain damage or **death**. TIAs can serve as an early warning sign of stroke and require immediate medical attention.

Description

Strokes are the third leading cause of death in the United States and the leading cause of disability. Approximately 500,000-600,000 people have strokes each year, and more than 160,000 die as a result. About 85% of these strokes are classified as ischemic. In ischemic stroke, a blood vessel leading to the brain

becomes blocked and an area of the brain is deprived of oxygenated blood. (The other 15% of strokes are caused by bleeding from a blood vessel that has ruptured.) Without the blood supply, the cells in that area of the brain die. Since brain cells cannot grow back, the functions that are controlled by that brain area may be permanently lost.

Approximately 10% of strokes are preceded by one or more TIAs. The estimated annual number of TIAs is about 50,000; an exact count is difficult because TIAs are not always reported. They may be under-reported because they typically last less than an hour, perhaps only for a few minutes. Because they are so brief, TIAs may not seem important. However, an estimated one-third of all TIAs are followed by a stroke within five years. They are considered a medical emergency and prompt medical attention is very important.

Risk factors for strokes and TIAs are very similar. The risk of a TIA or stroke is higher among men, African Americans, people over age 65, and people with heart disease or diabetes. Smokers, people with high blood pressure, and people who are overweight also have a greater risk for TIAs and strokes.

Causes and symptoms

A TIA is caused by a temporary blockage of one of the arteries that leads into the brain. Small blood clots, called microemboli, are the immediate cause of the blockage. The blockage forms because of damage or disease within the circulatory system. Blood clots can form in blood vessels because of artery damage, heart disease, and other cardiovascular problems. For example, **atherosclerosis** is strongly associated with TIAs. Atherosclerosis is the build-up of fatty deposits or plaque at certain areas in the circulatory system. Clotting cells in blood, called platelets, tend to stick to atherosclerotic plaques or other damaged sites within blood vessels. Occasionally, a clot may grow large enough to block a blood vessel, or a piece of a clot may break off and circulate to other areas of the body. If a clot does not dissolve quickly enough, it can lodge in a blood vessel and block it. In TIAs, the microemboli dissolve within a short time.

Blood flows into the brain through two main pathways: the carotid arteries and the vertebrobasilar arteries. The carotid arteries are located on the front of the neck; the vertebrobasilar arteries are at the base of the skull at the back of the head. The symptoms produced by a TIA are determined by the arteries affected.

If a vertebrobasilar artery is blocked, common symptoms include double vision and **dizziness**, **nausea**

and **vomiting**, difficulty speaking, and problems understanding and using spoken words. There may also be a numbness around the mouth and a tingling sensation in the limbs. Blockage of a carotid artery produces complete loss of vision, dimmed or foggy vision, and **paralysis** or weakness on one side of the body. These symptoms may also be accompanied by language problems and speech difficulty.

With either type of blockage, the microemboli dissolve within hours and full function returns.

Diagnosis

The goal of diagnosis is to identify the precise cause of the TIA and to recommend treatment. Initial information that an individual can supply includes a medical history, what drugs are currently being taken and why, and a full description of the symptoms. Blood tests are ordered to screen blood counts—that is, the numbers of specific blood cell types—and to measure sugar and lipid (fats, including cholesterol) levels. Based on this information and a **physical examination** that includes blood pressure, pulse, and respiration measurements, one or more of the following imaging tests are ordered.

A computed tomography scan (CT scan) or a **magnetic resonance imaging** (MRI) scan is usually the first imaging test. CT or MRI can rule out other problems, such as a tumor or **subdural hematoma**, which can mimic the symptoms of a TIA. A CT scan can also uncover aneurysms and arteriovenous malformation, both of which are blood vessel abnormalities that can cause bleeding in the brain.

Another imaging test that is very useful is carotid ultrasonography, a noninvasive procedure that allows examination of the interior of the carotid artery. This examination can detect carotid stenosis, a condition in which the artery is abnormally narrow because of atherosclerosis. Ultrasonography is very reliable in identifying stenosis, but it does not give enough information to accurately assess the degree of stenosis. Because the treatment used depends on the degree of stenosis, treatment decisions cannot be based on ultrasonography. Another type of ultrasonography, called **transcranial doppler ultrasonography**, is used to detect stenosis of the blood vessels within the brain and in the vertebral arteries.

If stenosis is identified, a further test called cerebral arteriography may be done. This test is not done if the individual is in poor health, because it may be too risky. Arteriography involves injecting a special dye into the blood vessels which makes them visible on x rays. This procedure is also used to find suspected

KEY TERMS

Angioplasty—A medical procedure in which a catheter, or thin tube, is threaded through blood vessels. The catheter is used to place a balloon or stent (a small metal rod) at an area of stenosis and expand it mechanically.

Arteriography—A medical test in which an x-ray visible dye is injected into blood vessels. This dye allows the blood vessels to be imaged with x rays.

Atherosclerosis—A build-up of fatty tissue called plaque inside arteries that can impede or block blood flow.

Carotid artery—One of the major blood vessels leading to the brain; it runs up the front of the neck.

Echocardiography—A type of ultrasonography that is used to create an image of the heart and its functioning.

Endarterectomy—A surgical procedure in which diseased tissue and atherosclerotic plaque are removed from the inside of an artery.

Ischemia—A condition in which blood flow is cut off or restricted from a particular area. The sur-

rounding tissue, starved of oxygen and nutrients, dies.

Microemboli—Small blot clots in the bloodstream.

Platelets—Tiny cells in the blood that help form blood clots.

Stenosis—The narrowing of an opening or passageway in the body. In arteries, stenosis is caused by a build-up of atherosclerotic plaque, disease, or other disorder.

Stroke—A condition in which blood flow to the brain has been blocked, thereby causing brain cells to die from lack of oxygen and nutrients; also called a “brain attack.”

Ultrasonography—A medical test in which sound waves are directed against internal structures in the body. As sound waves bounce off the internal structure, they create an image on a video screen.

Vertebral arteries—Major blood vessels that lead to the brain. They are located at the base of the skull at the back of the head.

problems with blood vessels in the brain. Because it is an invasive procedure, complications may arise. Typically, these complications are minor and temporary. In a very small percentage of people with cardiovascular disease, the procedure may cause serious complications, such as stroke.

Although TIAs affect the brain, the ultimate cause of the problem may be found in the heart. Heart disease or damage to the heart's blood vessels is assessed by **echocardiography**. Echocardiography is a type of ultrasonography and is a noninvasive procedure.

Treatment

Treatment is aimed at preventing further TIAs and especially at preventing a stroke. The particular therapy depends on the root cause of the TIA and is not begun until this cause is identified. If at all possible, drug therapy is the preferred method of treating TIAs. Surgical intervention may be required if an individual's situation is not likely to respond to medication or if medication has failed.

Aspirin is often chosen for drug therapy. It is sometimes called a blood thinner because it blocks the func-

tion of platelets, the sticky cells that trigger blood clotting. Since aspirin can cause gastrointestinal side effects, other drugs may be prescribed. These drugs include dipyridamole or ticlopidine hydrochloride (Ticlid). Dipyridamole, which works by relaxing the smooth muscles of the arteries, is not as effective as aspirin. Ticlopidine hydrochloride is an anti-platelet drug that is slightly more effective than aspirin, especially in women. However, it may cause **diarrhea** or lowered blood cell counts. Blood tests must, therefore, be done frequently when patients are taking ticlopidine.

If carotid arteriography reveals at least a 70% blockage of the carotid artery, surgical treatment is usually recommended. The particular surgical method is called carotid **endarterectomy**. In endarterectomy, the artery is opened and the material clogging it is removed. Another procedure, called **angioplasty**, has been suggested for treating carotid stenosis, but it is not widely used. This procedure is performed by threading a thin tube through the blood vessel to the site that is clogged. A balloon or a stent (a slender rod) is then passed through the tube to mechanically widen the narrowed area. This procedure is successfully used in other blood vessels in the body, but there is some worry that

using it close to the brain may be too dangerous. Surgical treatment of blockage of the vertebrobasilar arteries is not usually recommended.

Treatment of TIAs also focuses on underlying problems. High blood pressure, heart disease, and high levels of blood lipids all require medical intervention. Condition-specific medications are often prescribed and lifestyle changes are strongly encouraged. These changes include giving up **smoking** or excess alcohol consumption, engaging in physical **exercise**, and eating sensibly.

Prognosis

One-third of TIAs are followed by stroke in next five years; in the other two-thirds, the TIAs may either continue or disappear on their own. However, because of the risk of stroke-related disability and death, all TIAs should be treated as emergency medical situations.

Medical treatment significantly decreases the risk of stroke for people who experience one or more TIAs. Anti-platelet therapy with aspirin or ticlopidine may reduce risk as much as 31%. Carotid endarterectomy also substantially reduces stroke risk. The procedure itself carries some risk, but the complication rate is less than 5%. The risk of complication can be lowered by choosing to have the procedure done in a facility experienced with it and by a surgeon with a low complication rate.

Prevention

Treatment for TIAs is complemented by lifestyle changes. These practices may also prevent TIAs and strokes from ever occurring. Doctors and other health-care providers universally recommend that individuals stop smoking and consume alcohol in moderation. Regular health checkups can detect high blood pressure, heart disease, and other underlying problems. Adhering to treatment for these problems can help minimize TIA and stroke risks. Finally, maintaining a healthy weight and engaging in regular exercise as able are strongly recommended.

Resources

BOOKS

Current Medical Diagnosis and Treatment, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

PERIODICALS

Edmeads, John G. "Transient Ischemic Attacks: Rethinking Concepts in Management." *Postgraduate Medicine* 96, no. 5 (Oct. 1994): 42.

Hinkle, Janice L. "New Developments in Managing Transient Ischemic Attack and Acute Stroke." *AACN Clinical Issues* 8, no. 2 (May 1997): 205.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>. National Stroke Association. 9707 E. Easter Lane, Englewood, Co. 80112. (800) 787-6537. <<http://www.stroke.org>>.

Julia Barrett

Transplant reaction screening test see
Cytomegalovirus antibody screening test

Transplantation see **Corneal transplantation; Hair transplantation; Heart transplantation; Kidney transplantation; Lung transplantation; Pancreas transplantation**

Transposition of the great arteries

Definition

Transposition of the great arteries is a birth defect causing a fatal condition in which there is a reversal, or switch, in the truncal connections of the two main (great) blood vessels to the heart, the aorta and pulmonary artery.

Description

There are two great arteries, the pulmonary artery and the aorta. Normally, the pulmonary artery carries blood from the right ventricle to the lungs. The aorta carries blood from the left ventricle to the vessels of the rest of the body.

Normally, blood returning to the heart is depleted in oxygen. It goes first to the right atrium of the heart and then to the right ventricle where it is pumped to the lungs. While in the lungs, the blood picks up more oxygen. After the lungs, the blood flows to the left atrium, then the left ventricle, which pumps the blood out through the aorta to the rest of the body, thereby supplying the body with oxygenated blood.

Transposition of the great arteries results in oxygen-depleted blood going to the body. The reason is that the connection of the two great arteries is reversed. In this case, the aorta is connected to the right ventricle. Blood returning to the heart goes to the right atrium and ventricle, which is normal. Then, when the right ventricle pumps the blood out, it goes into the aorta for distri-

bution throughout the body. At the same time, blood in the lungs goes to the left atrium, the left ventricle, but then back to the lungs. This happens because the pulmonary artery is connected to the left ventricle. The result is that highly-oxygenated blood keeps recycling through the lungs, while oxygen-depleted blood recycles through the body without going through the lungs to reoxygenate.

This condition develops during the fetal stage and must be treated promptly after birth if the newborn is to survive. The newborn can survive for a few days because the foramen ovale, a small hole in the septum that separates the two atria, is open, allowing some oxygenated blood to escape and mix into the blood that is being pumped throughout the body. However, the foramen ovale normally closes within a few days after birth.

Causes and symptoms

Transposition of the great arteries is a birth defect that occurs during fetal development. There is no identifiable disease or cause. The main symptom is a “blue” baby appearance, caused by a general lack of oxygen in the body’s tissues.

Diagnosis

Diagnosis is made immediately after birth, when it is observed that the newborn is lacking oxygen. This is noted by the bluish color of the newborn, indicating **cyanosis**, a lack of oxygen. A definite diagnosis is made by x ray, **electrocardiography (ECG)**, and **echocardiography**.

Treatment

The only treatment for this condition is prompt heart surgery shortly after birth. In surgery, the two great arteries are reconnected to their proper destination. This restores the normal blood flow pattern. The coronary arteries are also reconnected, so that they can supply blood to the heart itself. A catheter may be used to maintain or enlarge the opening between the two atria until surgery can be performed.

Prognosis

Left untreated, this disease is fatal within the first weeks of life.

Prevention

Because there is no identifiable cause, there is no way to prevent this condition.

Resources

BOOKS

- Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill, 1998.
- Berkow, Robert, ed. *Merck Manual of Medical Information*. Whitehouse Station, NJ: Merck Research Laboratories, 1997.
- Larsen, D. E., ed. *Mayo Clinic Family Health Book*. New York: William Morrow and Co., Inc., 1996.

John T. Lohr, PhD

Transsexualism see **Gender identity disorder**

Transurethral bladder resection

Definition

Transurethral bladder resection is a surgical procedure, performed under **sedation** or anesthesia, with a lighted tube inserted through the urethra (the small tube-like structure that allows urine to empty from the bladder), into the bladder. It plays both a diagnostic and therapeutic role in the treatment of bladder cancers.

Purpose

Transurethral resection is the initial form of treatment for bladder cancers. The procedure is performed to remove and examine bladder tissue and/or tumor. It may also serve to remove lesions and be the only treatment necessary for noninvasive tumors.

Description

For this procedure, a lighted tube (resectoscope) is inserted through the urethra, into the bladder. A clear solution is infused to maintain visibility, and the tumor or tissue to be examined is cut away using an electric current. Tumor and muscle fibers are biopsied (a sample is cut out and examined, usually under a microscope) in order to evaluate the depth of tissue involvement, while avoiding perforation of the bladder wall. Every attempt is made to remove all visible tumor tissue, along with a small border of healthy tissue. The resected tissue is examined under the microscope for diagnostic purposes. An indwelling catheter may be inserted to ensure adequate drainage of the bladder postoperatively. At this

time, interstitial **radiation therapy** may be initiated if necessary.

Preparation

Preoperative x rays with dye studies are helpful as a guide in determining the character and extent of tumor involved. As with any surgical procedure, the patient is asked to sign a consent form after the procedure is thoroughly explained.

Aftercare

As with any surgical procedure, blood pressure and pulse will be monitored. Urine is expected to be bloodtinged in the early postoperative period. Continuous bladder irrigation (rinsing) may be used for approximately 24 hours after surgery. Most operative sites should be completely healed in three months. The patient is followed closely for possible recurrence with visual examination, using a special viewing device (cystoscope) at regular intervals as the physician deems necessary.

Abnormal results

Complications of the procedure may include bleeding, which may require bladder irrigation postoperatively, during which time the patient's activity is limited to bedrest. Perforation of the bladder is another risk, in which case the urinary catheter is left in place for four to five days postoperatively. The patient is started on antibiotic therapy preventively. If the bladder is lacerated, accompanied by spillage of urine into the abdomen, an abdominal incision may be required.

Resources

BOOKS

- Dollinger, Malin, et al. *Everyone's Guide to Cancer Therapy: How Cancer is Diagnosed, Treated, and Managed Day to Day*. 3rd ed. Kansas City: Andres & McMeel, 1998.
 Hanno, Philip, and Alan Wein. *Clinical Manual of Urology*. Philadelphia: McGraw-Hill, Inc., 1994.
 Lerner, Judith. *Mosby's Manual Of Urologic Nursing*. St. Louis: The C. V. Mosby Co., 1982.

ORGANIZATIONS

- American Cancer Society. 1599 Clifton Rd., NE, Atlanta, GA 30329-4251. (800) 227-2345. <<http://www.cancer.org>>. National Cancer Institute. Building 31, Room 10A31, 31 Center Drive, MSC 2580, Bethesda, MD 20892-2580. (800) 422-6237. <<http://www.nci.nih.gov>>.

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Transverse myelitis

Definition

Transverse myelitis (TM) is an uncommon neurological syndrome caused by inflammation (a protective response which includes swelling, **pain**, heat, and redness) of the spinal cord, characterized by weakness, back pain, and bowel and bladder problems. It affects one to five persons per million.

Description

TM affects the entire thickness of the spinal cord, producing both sensory and movement problems. It is believed to be linked to the immune system, which may be prompted to attack the body's own spinal cord. Striking rapidly without warning, its effects can be devastating.

Causes and symptoms

Transverse myelitis has many different causes, often triggered by a variety of viral and bacterial infections (especially those associated with a rash such as **measles** or **chickenpox**). Once the infection subsides, the inflammation in the cord begins. About a third of patients experience a flu-like illness with **fever** about the time they develop symptoms of TM. Sometimes, there appears to be a direct invasion of, and injury to, the spinal cord by an infectious agent (such as herpes zoster or the **AIDS** virus).

TM can also accompany a variety of diseases that break down tissue that surrounds and insulates the nerves (demyelinating diseases), such as **multiple sclerosis** (MS).

Some toxic substances, such as carbon monoxide, lead, or arsenic, can cause a type of myelitis characterized by inflammation followed by hemorrhage or bleeding that destroys the entire circumference of the spinal cord. Other types of myelitis can be caused by poliovirus; herpes zoster; **rabies**, **smallpox** or **poliovaccination**; or parasitic and fungal infections.

Many experts believe that TM can occur without any apparent cause, probably as the result of an autoimmune process. This means that a person's immune system attacks the spinal cord, causing inflammation and tissue damage.

Regardless of the cause of the myelitis, onset of symptoms is sudden and rapid. Problems with movement and sensation appear within one or two days after inflammation begins. Symptoms include soft (flaccid)

paralysis of the legs, with pain in the lower legs or back, followed by loss of feeling and sphincter (muscles which close an opening, as in the anus) control. The earliest symptom may be a girdle-like sensation around the trunk.

The extent of damage occurring will depend on how much of the spinal cord is affected, but TM rarely involves the arms. Severe spinal cord damage also can lead to **shock**.

Diagnosis

A doctor will suspect transverse myelitis in any patient with a rapid onset of paralysis. Medical history, **physical examination**, brain and spinal cord scans, myelogram, spinal tap, and blood tests are used to rule out other neurological causes of symptoms, such as a tumor. If none of these tests suggest a cause for the symptoms, the patient is presumed to have transverse myelitis.

Treatment

There is no effective treatment for transverse myelitis, but any underlying infection must be treated. After this, the focus of care shifts from diagnosis and treatment to learning how to live with the effects of the syndrome. Patients are helped to cope psychologically with new limitations, and are given physical **rehabilitation**.

Physical adaptations include learning to cope with bowel and bladder control, sexuality, inability to control muscles (spasticity), mobility, pain, and activities of daily living (such as dressing).

As nerve impulses from the spinal cord are often scrambled and misinterpreted by the brain as pain, painkillers are given to ease discomfort. Antidepressants or anticonvulsants may also help.

Prognosis

The prognosis depends on how much of the cord was damaged. Some people recover completely, while others have lasting problems and need help in learning how to cope with activities of daily living. People who develop spastic reflexes early in the course of the condition are more likely to recover than those who do not. If spinal cord tissue **death** (necrosis) occurs, the chance of a complete recovery is poor. Most recovery occurs within the first three months. A certain percentage of patients with TM will go on to develop multiple sclerosis.

KEY TERMS

Demyelinating disorders—A group of diseases characterized by the breakdown of myelin, the fatty sheath surrounding and insulating nerve fibers. This breakdown interferes with nerve function, and can result in paralysis. Multiple sclerosis is a demyelinating disorder.

Myelogram—An x-ray examination of the brain and spinal cord with the aid of a contrast dye, to look for tumors or spinal cord injury.

Resources

BOOKS

Stone, L. A. "Transverse Myelitis." In *Neuroimmunology for the Clinician*, ed. L. A. Rolak and Y. Harati. New York: Butterworth-Heinemann, 1997.

PERIODICALS

Scott, T.F., et.al. "Transverse Myelitis: Comparison with Spinal Cord Presentations of Multiple Sclerosis." *Neurology* 50, no. 2 (Feb. 1998): 429-433.

ORGANIZATIONS

Transverse Myelitis Association. 1787 Sutter Parkway, Powell, OH 43065-8806. (614) 766-1806. <<http://www.myelitis.org>>.

Carol A. Turkington

Tranylcypromine see **Monoamine oxidase inhibitors**

Traumatic amputations

Definition

Traumatic amputation is the accidental severing of some or all of a body part. A complete amputation totally detaches a limb or appendage from the rest of the body. In a partial amputation, some soft tissue remains attached to the site.

Description

Trauma is the second leading cause of amputation in the United States. About 30,000 traumatic amputations occur in this country every year. Four of every five traumatic amputation victims are male, and most of them are between the ages of 15–30.

Traumatic amputation most often affects limbs and appendages like the arms, ears, feet, fingers, hands, legs, and nose.

Causes and symptoms

Farm and factory workers have greater-than-average risks of suffering injuries that result in traumatic amputation. Automobile and motorcycle accidents and the use of lawnmowers, saws, and power tools are also common causes of traumatic amputation.

Blood loss may be massive or minimal, depending on the nature of the injury and the site of the amputation. Patients who lose little blood and have less severe injuries sometimes feel more **pain** than patients who bleed heavily and whose injuries are life-threatening.

Diagnosis

When the patient and the amputated part(s) reach the hospital, an Emergency Department physician will assess the probability that the severed tissue can be successfully reattached.

The Mangled Extremity Severity Score (MESS) assigns numerical values to such factors as body temperature, circulation, numbness, **paralysis**, tissue health, and the patient's age and general health. This is one of the diagnostic tools used to determine how successful reattachment surgery is apt to be. The total score is doubled if blood supply to the amputated part has been absent or diminished for more than six hours.

A general, emergency, or orthopedic surgeon makes the final determination about whether surgery should be performed. The surgeon also considers the patient's wishes and lifestyle. Additional concerns are how and to what extent the amputation will affect the patient's quality of life and ability to perform everyday activities.

Treatment

First aid or emergency care given immediately after the amputation has a critical impact on both the physicians' ability to salvage and reattach the severed part(s) and the patient's ability to regain feeling and function.

Muscle tissue dies quickly, but a well-preserved part can be successfully reattached as much as 24 hours after the amputation occurs. Tissue that has not been preserved will not survive for more than six hours.

Initial response

The most important steps to take when a traumatic amputation occurs are:



This man's hand was surgically reattached following a traumatic amputation. (Photograph by Michael English, M.D., Custom Medical Stock Photo. Reproduced by permission.)

- Contact the nearest emergency services provider, clearly describe what has happened, and follow any instructions given.
- Make sure the victim can breathe; administer **CPR** if necessary.
- Control bleeding, using direct pressure but minimizing or avoiding contact with blood and other body fluids.
- Patients should not be moved if back, head, leg, or neck injuries are suspected or if motion causes pain. If none are found by the EMT, lie the victim flat, with the feet raised 12 inches above the surface.
- Cover the victim with a coat or blanket to prevent shock.

The injured site should be cleansed with a sterile solution and wrapped in a clean towel or other thick material that will protect the wound from further injury. Tissue that is still attached to the body should not be forced back into place. If it cannot be gently replaced, it should be held in its normal position and supported until additional care is available.

Saving the patient's life is always more important than recovering the amputated part(s). Transporting the patient to a hospital or emergency center should never be delayed until missing pieces are located.

Preserving tissue

No amputated body part is too small to be salvaged. Debris or other contaminating material should be removed, but the tissue should not be allowed to get wet.

KEY TERMS

Phantom pain—Pain, tingling, itching, or numbness in the place where the amputated part used to be.

An amputated body part should be wrapped in bandages, towels, or other clean, protective material and sealed in a plastic bag. Placing the sealed bag in a cooler or in a container that is inside a second container filled with cold water or ice will help prevent tissue deterioration.

Prognosis

Possible complications of traumatic amputation include:

- excessive bleeding
- infection
- muscle shortening
- pulmonary embolism

Improved medical and surgical care and **rehabilitation** have improved the long-term outlook for these patients.

Phantom pain

About 80% of all amputees over the age of four experience tingling, **itching**, numbness, or pain in the place where the amputated part used to be. Phantom sensations may begin immediately after the amputation, or they may develop months or years later. They often occur after an injury to the site of the amputation.

These intermittent feelings may:

- occur frequently or only once in a while
- be mild or intense
- last for a few minutes or several hours
- help patients adjust more readily to an artificial limb (prosthesis)

Prevention

The best way to prevent traumatic amputation is to observe common-sense precautions like using seat belts and obeying speed limits and other traffic regulations. It is important to take special precautions when using potentially dangerous equipment and make sure machinery is turned off and disconnected before attempting to service or repair it. Appropriate protective clothing should be worn at all times.

Resources

BOOKS

Sheehy, Susan Budassi. *Manual of Emergency Care*. St. Louis: The C. V. Mosby Co., 1990.

ORGANIZATIONS

American Amputation Foundation, Inc. P.O. Box 250218, Hillcrest Station, Little Rock, AR 72225. (501) 666-2523.

The Amputee Coalition of America. P.O. Box 2528, Knoxville, TN 37901-2528. (888) 267-5669. <<http://www.amputee-coalition.org>>.

OTHER

“Amputation.” *ThriveOnline*. 23 May 1998 <<http://thriveonline.oxygen.com>>.

“Amputation, Traumatic.” *HealthAnswers.com* 24 May 1998 <<http://www.healthanswers.com/database/ami/converted/000006.htm>>.

Maureen Haggerty

Traveler's diarrhea

Definition

The occurrence of multiple loose bowel movements in someone traveling to an area outside of their usual surroundings (usually from temperate industrialized regions to tropical areas), is known as traveler's **diarrhea** (TD). The cause is almost always due to a bacterial or viral infection, acquired through ingesting contaminated food or water.

Description

It is estimated that anywhere from 20–50% of the 12–20 million travelers going from temperate industrialized countries to the tropics will develop TD. Fortunately, most of these episodes are of short duration; nevertheless, about 40% of those affected will need to rearrange their schedule, and 20% will be ill enough to remain in bed for some days.

The chance of winding up with TD is directly related to the area one is traveling to; only about 8% of individuals visiting an industrialized country are affected, whereas at least half of those traveling to non-industrialized regions become ill. It is also clearly related to the number of potentially contaminated foods or beverages consumed. Attention to recommended guidelines regarding food safety and sanitation can greatly decrease the risk of infection.

Causes and symptoms

Bacterial infections are the most common cause of the illness. Viruses and occasional parasites can also be

the cause. As for the bacteria involved, toxin producing types of *E. coli* (called enterotoxigenic) account for approximately 40–60% of cases, with *Campylobacter* and *Shigella* each reported in at least 10% of cases. In some studies, *Campylobacter* has accounted for almost half of the attacks, especially during cooler seasons of the year. The cause can vary depending on several factors, including the season and country visited. More than one organism can be found in 15–30% of cases, and none is identified in up to 40% of cases worldwide.

Rotaviruses and a parvovirus called Norwalk agent are also responsible for TD. *Giardia* is probably the most common parasite identified, though amoebas (*Entamoeba histolytica*), *Cryptosporidium*, and *Cyclospora* are being found with increasing frequency.

Younger age groups, particularly students, are at greatest risk, probably because of where and what they eat. Individuals over 55 years of age, persons staying with relatives, or business travelers are at lower risk. Foods with the highest chance of transmitting disease are uncooked vegetables, unpeeled fruits, meat, and seafood. Tap water and even ice can be dangerous unless one is sure of the source.

Symptoms usually start within a few days after arrival, but can be delayed for as long as two weeks. Illness lasts an average of three to five days, but is sometimes longer. Cramping abdominal pain, lack of appetite, and diarrhea are the main complaints. In approximately 10% of patients, diarrhea turns bloody and fever develops in about half of those. The presence of bloody bowel movements and fever usually indicates a more severe form of illness and makes *Shigella* a more likely cause. Medications that decrease the motility or contractions of the intestine, such as loperamide (Imodium) or diphenoxylate (Lomotil), should not be used when fever or bleeding occur.

Complications

Diarrhea varies from a few loose stools per day to 10 or more. Dehydration and changes in the normal blood pH (acid-base balance) are the main dangers associated with TD. Signs of dehydration can be hard to notice, but increasing thirst, dry mouth, weakness or lightheadedness (particularly if worsening while standing), or a darkening/decrease in urination are suggestive. Severe dehydration and changes in the body's chemistry can lead to kidney failure and become life-threatening.

Another potential complication is "toxic megacolon," in which the colon gradually stretches and its wall thins to the point where it can tear. The presence of a hole in the intestine leads to peritonitis and is fatal unless quickly recognized and treated.

Other complications related to TD can involve the nervous system, skin, blood, or kidneys.

Diagnosis

The occurrence of diarrhea in an individual while traveling is very suggestive of TD. Although there are other possible causes, these are less likely. In most instances, the specific organism responsible for the symptoms does not need to be identified, and the majority of patients need only rest and treatment to avoid potential complications.

When patients develop fever or bloody diarrhea, the illness is more serious and a specific diagnosis is needed. In those cases, or when symptoms last longer than expected, stool samples are obtained to identify the organism.

For this purpose, laboratories can either try to grow (culture) the organism, or identify it with high-powered microscopes (electron microscopy) or with the use of special tests or stains. These can show parasites such as *Giardia*, *Amoeba*, *Cryptosporidium* and others in freshly obtained stool specimens. New techniques that involve identification of DNA (the characteristic material that controls reproduction and is unique for all individuals) of the various organisms, can also be used in special circumstances.

Treatment

The best treatment of TD is prevention; however, once disease occurs, therapy is aimed at preventing or reducing dehydration, and using antibiotics when needed. Fortunately, severe dehydration is unusual in patients with TD, but any fluid losses should be treated early with either fruit juices and "clear fluids" such as tea or broth, or with the recommended Oral Rehydration Solutions (ORS) suggested by the World Health Organization (WHO). Persons traveling to known areas of infection should consult with their physician prior to departure and obtain appropriate instructions. For example, it may be advised to take along pre-prepared packets of ORS designed for easy mixing or commercial preparations such as Pedialyte, Ceralyte, Ricelyte, etc.

When nothing else is available, the following WHO recipe can be made up from household items and taken in small frequent sips;

- table salt: 3/4 teaspoon
- baking powder: 1 teaspoon
- orange juice: 1 cup
- water: 1 quart or liter

A debate has occurred in the medical community over the amount of salt (sodium) in the WHO preparations; some physicians feel that the content is too much for use by well-nourished persons in developed countries. Therefore these preparations should not be used for extended periods of time without consulting a physician.

KEY TERMS

Oral Rehydration Solution (ORS)—A liquid preparation developed by the World Health Organization that can decrease fluid loss in persons with diarrhea. Originally developed to be prepared with materials available in the home, commercial preparations have recently come into use.

Pepto-Bismol (bismuth subsalicylate preparation) is effective in both preventing and treating TD. For treatment once symptoms begin, the drug must be taken more frequently than when used for prevention. Bismuth subsalicylate preparation (1 oz of liquid or two 262.5 mg tablets every 30 minutes for eight doses) has been shown to decrease the number of bowel movements and shorten the length of illness. However, there is some concern about the large doses of bismuth in patients with kidney disease; therefore patients should check with physicians before starting this or any other therapy. Patients should be aware that bismuth can turn bowel movements black in color.

Medications designed to decrease intestinal motility and contractions such as loperamide (Imodium), diphenoxylate (Lomotil), or others are safest when used by those without fever or bloody bowel movements. The presence of either of these symptoms indicates a more severe form of colitis.

Antibiotics are usually not needed, because most cases of TD rapidly improve with minimal treatment. For patients in whom symptoms are especially severe (4 or more stools per day or the onset of bloody diarrhea or fever), antibiotics are indicated. Individuals with less severe attacks can be treated with either antimotility medications or bismuth subsalicylate.

Choice of an antibiotic should ideally be tailored to the most likely organism and then adjusted according to results of stool cultures. Trimethoprim-sulfamethoxazole (Bactrim) or ciprofloxacin (Cipro) are the antibiotics most often prescribed, but others are also used. The type and duration of treatment continues to be revised, and it is therefore extremely important that patients check with a physician prior to beginning treatment. In many instances, an antibiotic can be combined with an antimotility agent to provide the quickest relief.

Prognosis

Up to 1% of patients with TD will become sick enough to require hospitalization, and 3% will continue

to experience diarrhea for at least one month. The majority of patients rapidly recover with minimal therapy. Some will suffer symptoms for even longer. The small number who continue to suffer symptoms will need careful evaluation to rule out the many causes of chronic diarrhea (such as lactase deficiency, **irritable bowel syndrome**, parasites, etc.). It is unusual for diarrhea caused by bacteria to last over two weeks; therefore, more prolonged diarrhea indicates a non-bacterial cause.

Prevention

The best means of prevention is avoiding foods, beverages, and food handling practices that lead to infection with the organisms that cause TD.

One effective means to prevent TD is liquid Pepto-Bismol; this bismuth-containing compound has been shown to be very effective in reducing the incidence of TD. Tablets are now available, which are easier to carry. Two tablets four times a day is recommended, but use should not go beyond three weeks.

Antibiotics can also prevent TD, but their use is controversial, unless it is absolutely necessary to avoid infection (such as someone on an important business trip). There is the tendency for bacteria to become resistant to these medications if used excessively; and these drugs do have side effects which can be worse than the effects of TD. The benefits and risks of antibiotic treatment should be carefully weighed.

Resources

BOOKS

Butterton, Joan R., and Stephen Calderwood. "Acute Infectious Diarrheal Diseases and Bacterial Food Poisoning." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Hamer, Davidson H., and Sherwood L. Gorbach. "Traveler's Diarrhea." In *Sleisenger & Fordtran's Gastrointestinal and Liver Disease*, ed. Mark Feldman, et al. Philadelphia: W. B. Saunders Co., 1997.

Keystone, J. S., and P. E. Kozarsky. "Health Risks to Travelers." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

PERIODICALS

Dupont, Herbert L., et al. "Guidelines on Acute Infectious Diarrhea in Adults." *American Journal of Gastroenterology* 92, no. 11 (1992, 1997).

"Traveler's Diarrhea: Don't Let It Ruin Your Trip." *Mayo Clinic Health Letter* (Jan. 1997).

"When Microbes are on the Menu." *Harvard Health Letter* (Dec. 1994): 4-5.

OTHER

Centers for Disease Control. <<http://www.cdc.gov/nccdp/ph/dt/ddthome.htm>>.

Centers for Disease Control. <<http://www.cdc.gov/nccdphe/ddt/ddthome.htm>>.

David Kaminstein, MD

Tremors

Definition

Tremor is an unintentional (involuntary), rhythmical alternating movement that may affect the muscles of any part of the body. Tremor is caused by the rapid alternating contraction and relaxation of muscles and is a common symptom of diseases of the nervous system (neurologic disease).

Description

Occasional tremor is felt by almost everyone, usually as a result of fear or excitement. However, uncontrollable tremor or shaking is a common symptom of disorders that destroy nerve tissue, such as **Parkinson's disease** or **multiple sclerosis**. Tremor may also occur after **stroke** or **head injury**. Other tremors appear without any underlying illness.

Causes and symptoms

Tremor may be a symptom of an underlying disease, and it may be caused by drugs. It may also exist as the only symptom (essential tremor).

Underlying disease

Some types of tremor are signs of an underlying condition. About a million and a half Americans have Parkinson's disease, a disease that destroys nerve cells. Severe shaking is the most apparent symptom of Parkinson's disease. This coarse tremor features four to five muscle movements per second. The shaking is evident at rest but declines or disappears during movement.

Other disorders that cause tremor are multiple sclerosis, Wilson's disease, mercury **poisoning**, thyrotoxicosis, and **liver encephalopathy**.

A tremor that gets worse during body movement is called an "intention tremor." This type of tremor is a sign that something is amiss in the cerebellum, a region of the brain concerned chiefly with movement, balance and coordination.

Essential tremor

Many people have what is called "essential tremor," in which the tremor is the only symptom. This type of shaking affects between three and four million Americans.

The cause of essential tremor is not known, although it is an inherited problem in more than half of all cases. The genetic condition has an autosomal dominant inheritance pattern, which means that any child of an affected parent will have a 50% chance of developing the condition.

Essential tremor most often appears when the hands are being used, whereas a person with Parkinson's disease will most often have a tremor while walking or while the hands are resting. People with essential tremor will usually have shaking head and hands, but the tremor may involve other parts of the body. The shaking often begins in the dominant hand and may spread to the other hand, interfering with eating and writing. Some people also develop a quavering voice.

Essential tremor affects men and women equally. The shaking often appears at about age 45, although the disorder may actually begin in adolescence or early adulthood. Essential tremor that begins very late in life is sometimes called "senile tremor."

Drugs and tremor

Several different classes of drugs can cause tremor as a side effect. These drugs include amphetamines, anti-depressant drugs, antipsychotic drugs, caffeine, and lithium. Tremor also may be a sign of withdrawal from alcohol or street drugs.

Diagnosis

Close attention to where and how the tremor appears can help provide a correct diagnosis of the cause of the shaking. The source of the tremor can be diagnosed when the underlying condition is found. Diagnostic techniques that make images of the brain, such as computed tomography scan (CT scan) or **magnetic resonance imaging** (MRI), may help form a diagnosis of multiple sclerosis or other tremor caused by disorders of the central nervous system. Blood tests can rule out such metabolic causes as thyroid disease. A family history can help determine whether the tremor is inherited.

Treatment

Neither tremor nor most of its underlying causes can be cured. Most people with essential tremor respond to drug treatment, which may include propranolol, primidone, or a benzodiazepine. People with Parkinson's disease may respond to levodopa or other **antiparkinson drugs**.

Research has shown that about 70% of patients treated with botulinum toxin A (Botox) have some improvement in tremor of the head, hand, and voice. Botulinum is derived from the bacterium *Clostridium botulinum*. This

KEY TERMS

Computed tomography (CT) scan—An imaging technique in which cross-sectional x rays of the body are compiled to create a three-dimensional image of the body's internal structures.

Essential tremor—An uncontrollable (involuntary) shaking of the hands, head, and face. Also called familial tremor because it is sometimes inherited, it can begin in the teens or in middle age. The exact cause is not known.

Fetal tissue transplantation—A method of treating Parkinson's and other neurological diseases by grafting brain cells from human fetuses onto the affected area of the human brain. Human adults cannot grow new brain cells but developing fetuses can. Grafting fetal tissue stimulates the growth of new brain cells in affected adult brains.

Intention tremor—A rhythmic purposeless shaking of the muscles that begins with purposeful (voluntary) movement. This tremor does not affect muscles that are resting.

Liver encephalopathy—A condition in which the brain is affected by a buildup of toxic substances that would normally be removed by the liver. The condition occurs when the liver is too severely damaged to cleanse the blood effectively.

Multiple sclerosis—A degenerative nervous system disorder in which the protective covering of the nerves in the brain are damaged, leading to tremor and paralysis.

Magnetic resonance imaging (MRI)—An imaging technique that uses a large circular magnet and radio waves to generate signals from atoms in the body. These signals are used to construct images of internal structures.

Pallidotomy—A surgical procedure that destroys a small part of a tiny structure within the brain called the globus pallidus internus. This structure is part of the basal ganglia, a part of the brain

involved in the control of willed (voluntary) movement of the muscles.

Parkinson's disease—A slowly progressive disease that destroys nerve cells. Parkinson's is characterized by shaking in resting muscles, a stooping posture, slurred speech, muscular stiffness, and weakness.

Thalamotomy—A surgical procedure that destroys part of a large oval area of gray matter within the brain that acts as a relay center for nerve impulses. The thalamus is an essential part of the nerve pathway that controls intentional movement. By destroying tissue at a particular spot on the thalamus, the surgeon can interrupt the nerve signals that cause tremor.

Thalamus—A large oval area of gray matter within the brain that relays nerve impulses from the basal ganglia to the cerebellum, both parts of the brain that control and regulate muscle movement.

Thyrotoxicosis—An excess of thyroid hormones in the blood, causing a variety of symptoms that include rapid heart beat, sweating, anxiety, and tremor.

Tremor control therapy—A method for controlling tremor by self-administered shocks to the part of the brain that controls intentional movement (thalamus). An electrode attached to an insulated lead wire is implanted in the brain; the battery power source is implanted under the skin of the chest, and an extension wire is tunneled under the skin to connect the battery to the lead. The patient turns on the power source to deliver the electrical impulse and interrupt the tremor.

Wilson's disease—An inborn defect of copper metabolism in which free copper may be deposited in a variety of areas of the body. Deposits in the brain can cause tremor and other symptoms of Parkinson's disease.

bacterium causes **botulism**, a form of **food poisoning**. It is poisonous because it weakens muscles. A very weak solution of the toxin is used in cases of tremor and **paralysis** to force the muscles to relax. However, some patients experience unpleasant side effects with this drug and cannot tolerate effective doses. For other patients, the drug becomes less effective over time. About half of patients don't get any relief of tremor from medications.

Tremor control therapy

Tremor control therapy is a type of treatment using mild electrical pulses to stimulate the brain. These pulses block the brain signals that trigger tremor. In this technique, the surgeon implants an electrode into a large oval area of gray matter within the brain that acts as a relay center for nerve impulses and is involved in generating

movement (thalamus). The electrode is attached to an insulated wire that runs through the brain and exits the skull where it is attached to an extension wire. The extension is connected to a generator similar to a heart pacemaker. The generator is implanted under the skin in the chest, and the extension is tunneled under the skin from the skull to the generator. The patient can control his or her tremor by turning the generator on with a hand-held magnet to deliver an electronic pulse to the brain.

Some patients experience complete relief with this technique, but for others it is of no benefit at all. About 5% of patients experience complications from the surgical procedure, including bleeding in the brain. The procedure causes some discomfort because patients must be awake while the implant is placed. Batteries must be replaced by surgical procedure every three to five years.

Other surgical treatments

A patient with extremely disabling tremor may find relief with a surgical technique called thalamotomy, in which the surgeon destroys part of the thalamus. However, the procedure is complicated by numbness, balance problems, or speech problems in a significant number of cases.

Pallidotomy is another type of surgical procedure sometimes used to decrease tremors from Parkinson's disease. In this technique, the surgeon destroys part of a small structure within the brain called the globus pallidus internus. The globus is part of the basal ganglia, another part of the brain that helps control movement. This surgical technique also carries the risk of disabling permanent side effects.

Fetal tissue transplantation (also called a nigral implant) is a controversial experimental method to treat Parkinson's disease symptoms. This method implants fetal brain tissue into the patient's brain to replace malfunctioning nerves. Unresolved issues include how to harvest the fetal tissue and the moral implications behind using such tissue; the danger of tissue rejection; and how much tissue may be required. Although initial studies using this technique looked promising, there has been difficulty in consistently reproducing positive results.

Small amounts of alcohol may temporarily (sometimes dramatically) ease the shaking. Some experts recommend a small amount of alcohol (especially before dinner). The possible benefits, of course, must be weighed against the risks of alcohol abuse.

Prognosis

Essential tremor and the tremor caused by neurologic disease (including Parkinson's disease) slowly get

worse and can interfere with a person's daily life. While the condition is not life-threatening, it can severely disrupt a person's everyday experiences.

Prevention

Essential tremor and tremor caused by a disease of the central nervous system cannot be prevented. Avoiding use of stimulant drugs such as **caffeine** and amphetamines can prevent tremor that occurs as a side effect of drug use.

Resources

BOOKS

- Greenberg, David A., et al. *Clinical Neurology*. 2nd ed. Norwalk, CT: Appleton & Lange, 1993.
Weiner, William J., and Christopher Goetz. "Essential Tremor." *In Neurology for the Non-Neurologist*. Philadelphia: J. B. Lippincott, 1994.

ORGANIZATIONS

- American Academy of Neurology. 1080 Montreal Ave., St. Paul, MN 55116. (612) 695-1940. <<http://www.aan.com>>. American Parkinson Disease Association. 60 Bay Street, Suite 401, Staten Island, NY 10301. (800) 223-2732. <<http://www.apdaparkinson.org>>. International Tremor Foundation. 7046 West 105th St., Overland Park, KS 66212. (913) 341-3880. National Parkinson Foundation. 1501 N.W. 9th Ave., Miami, FL 33136-1494. (800) 327-4545. <<http://www.parkinson.org>>.

Carol A. Turkington

Trench fever

Definition

Trench fever is a bacterial infection that causes repeated cycles of high fever.

Description

The term trench fever refers to the crowded conditions in which troops fought in during World War I and World War II. Because the causative bacteria are passed among humans through contact with body lice, overcrowding, and conditions which interfere with good hygiene (including regular washing of clothing) soldiers were predispose to this disease. Currently, homeless people in the United States are sometimes diagnosed with this illness. The bacteria are sometimes passed through the bite of an infected tick. This can cause the illness in

people who participate in outdoor activity and encounter ticks in that particular area.

Causes and symptoms

Two different bacteria can cause trench fever: *Bartonella quintana* and *Bartonella henselae*. *B. quintana* is carried by body lice; *B. henselae* is carried by ticks.

Infection with *B. quintana* occurs when an infected louse defecates while feeding on a human. When the person scratches, the feces (which are full of bacteria) are rubbed into the tiny wound. Infection with *B. henselae* occurs when an infected tick bites a human, passing the bacteria along through the tiny bite wound.

Symptoms of trench fever begin about 2 weeks to a month after exposure to the bacteria. Sudden fever, loss of energy, **dizziness**, **headache**, weight loss, skin rash, severe muscle and bone **pain** can occur. Pain is particularly severe in the shins, leading to the nickname "shin bone fever." The fever can reach 105°F (40.5°C) and stays high for five to six days at a time. The temperature then drops, and stays down for several days, usually recurring in five- to six-day cycles. An individual may experience as many as eight cycles of fever with the illness.

Diagnosis

Diagnosis is usually made on the basis of the patient's symptoms, and on knowledge of the conditions in which the patient lives. A blood sample can be drawn and bacteria in the sample are allowed to grow. Identification is made by looking at the number of bacteria that may be present on a glass slide seen under the lens of a microscope. However, this technique can take up to four weeks, because this type of bacterium grows very slowly. By this time, the practitioner has often decided to treat the patient anyway.

Treatment

Erythromycin and azithromycin are both used to treat trench fever. Four weeks of treatment are usually necessary. Inadequate treatment often results in a relapse. In fact, relapses have been reported to occur as long as 10 years after the first episode.

Prognosis

Prognosis for patients with trench fever is excellent. Recovery may take a couple of months. Without treatment, there is always a risk of recurrence, even years after the original illness.

Prevention

Prevention involves good hygiene and decent living conditions. When this is impossible, insecticide dusting

powders are available to apply to clothing. Avoidance of areas known to harbor ticks or the use of insect repellents is necessary to avoid the type of infection passed by ticks.

Resources

BOOKS

Corey, Lawrence. "Rickettsia and Coxiella." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

Tompkins, Lucy S. "Bartonella Infections, Including Cat-Scratch Disease." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

PERIODICALS

Bovsun, Mara. "World War I's Trench Fever Germ Making Comeback Among Poor, Homeless." *Biotechnology Newswatch* (5 Jan. 1998): 6.

Relman, David A. "Has Trench Fever Returned?" *The New England Journal of Medicine* 332, no. 7 (16 Feb. 1995): 463+.

Tompkins, Lucy S. "Bartonella Species Infections, Including Cat-Scratch Disease, Trench Fever, and Bacillary Angiomatosis: What Molecular Techniques Have Revealed." *The Western Journal of Medicine* 164, no. 1 (Jan. 1996): 39+.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

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Treponema carateum infection see **Pinta**

Treponema pallidum infection see **Syphilis**

Tretinoin see **Antiacne drugs**

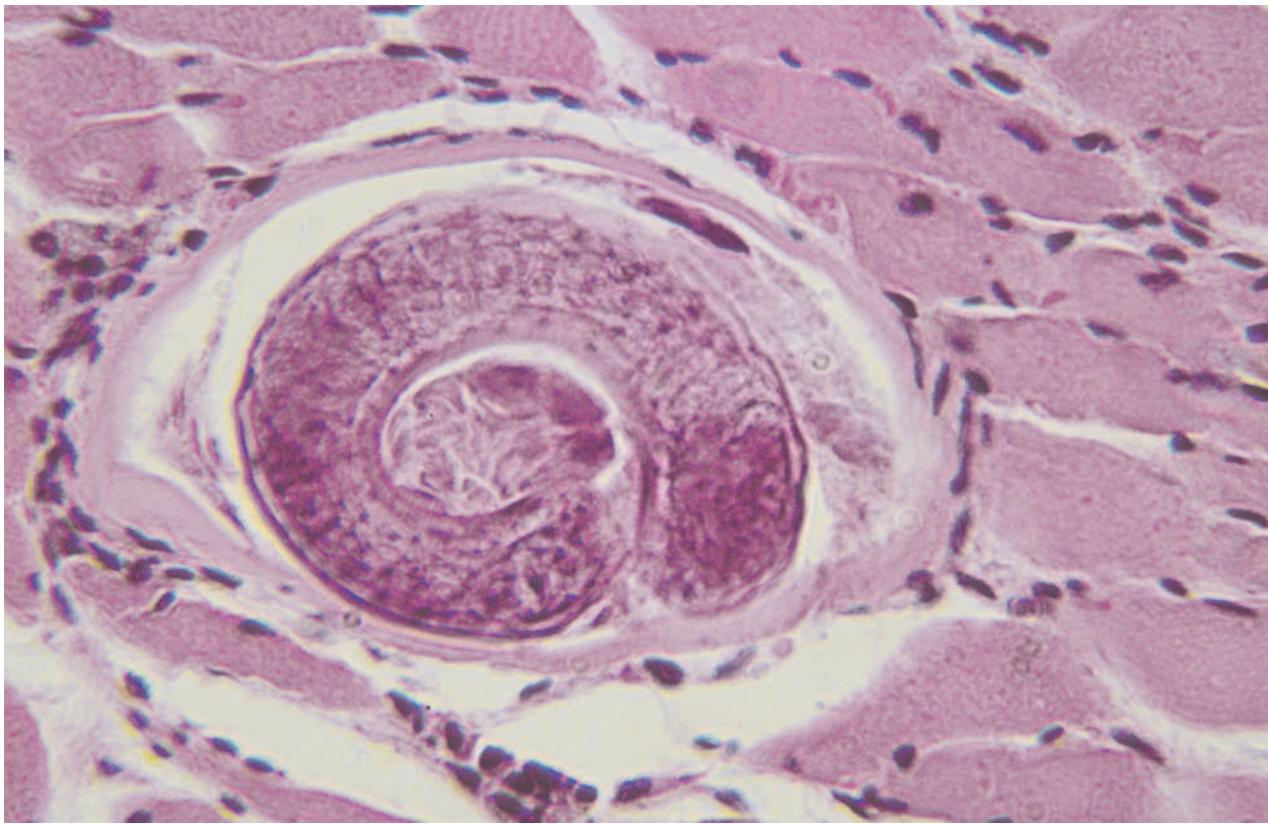
Trichinella spiralis infection see **Trichinosis**

Trichiniasis see **Trichinosis**

Trichinosis

Definition

Trichinosis is a disease caused by a roundworm (nematode) called *Trichinella spiralis*. An individual worm of this species is called a trichina, from the Greek word meaning "hairlike." Trichinae can be readily avoided by proper handling and cooking of certain meats, particularly pork products.



A *Trichinella spiralis* cyst in striated muscle tissue. *T. spiralis* cysts can survive up to ten years in this form. (JLM Visuals. Reproduced by permission.)

Description

The life cycle of *T. spiralis* includes several different stages. The adult trichina lives in the intestinal lining of such meat-eating animals as swine, bears, walrus, and rodents. After mating, the male worm dies while the female goes on to produce the offspring.

Roundworms have a stage of development called the embryonic stage, which in many species occurs after birth. In trichinae, however, this embryonic stage occurs within the uterus of the female, so that the offspring that are ultimately discharged into the host's intestinal lining are in the larval second stage of life. These larvae—about 1500 from each female worm—travel through the circulatory system to the heart, then through the blood vessels leading to striated muscle (the muscle of the skeletal system and the heart). Most larvae that cannot find suitable locations in striated muscle will die.

Those larvae that reach striated muscle will grow to a length of about one millimeter, coil themselves, and enclose themselves within a protective wall called a cyst. This process is referred to as encysting. The worms in the cysts can live for up to ten years in this form.

A pig that has been infected with *T. spiralis*, then, has thousands of cysts lying dormant within its muscles—the very muscles that humans look forward to consuming in the form of pork chops, ham, barbecued ribs, etc. When humans sit down to a delicious meal of undercooked, trichina-infected pig dinner, they are ingesting *T. spiralis* cysts. The cyst walls are broken down by the usual process of food digestion in the stomach, allowing the larvae to escape into the new host's intestines. There the larvae mature to become adult worms, capable of producing a new crop of larvae. When these new larvae hatch, they begin their migration throughout the human host's bloodstream to his or her muscles, where they live for a short while before encysting.

Causes and symptoms

Human hosts who eat meat infested with trichinae may experience symptoms in varying degrees. If the meat ingested has only a few cysts, then the human host's load of parasites (worm burden) is said to be relatively small, and symptoms will be moderate. In fact, many trichinosis infections are subclinical, which means that the symptoms are so mild that the infection remains undiagnosed.

In a host with a greater worm burden, the initial symptoms will be caused by the presence of the adult worms in the intestine. These symptoms usually include **fever**, **diarrhea**, **abdominal pain**, and perhaps vomiting. The symptoms begin about one to two days after eating the contaminated meat, and may last for a week or so.

When the larvae begin their migration through the blood vessels, the host will begin to experience symptoms that affect the whole body (systemic symptoms), such as fever; swelling of the face and the area around the eyes; rash; bleeding into the nail beds, retina, and whites of the eyes; and **cough**. In very severe cases of trichinosis, inflammation of the heart muscle (**myocarditis**), lungs (pneumonitis), or brain (**encephalitis**) may occur. These symptoms can lead to the few deaths caused by trichinosis.

The larvae begin to burrow into the host's muscles and form cysts within two to three weeks of the initial infection. This encysting produces signs of muscle inflammation (myositis) including swelling of the affected muscle groups, pain, and weakness. The most frequently affected muscles are the muscles outside the eye (extraocular muscles) that control eye movements; the muscles of the jaw, neck, and upper arm (biceps muscle); the muscles of the lower back (lumbar region); and the diaphragm, which is the muscle that separates the abdominal and chest cavities and aids in breathing.

The symptoms of trichinosis are at their most severe at about three weeks after infection, and decrease very slowly in their severity. Recovery is extremely gradual, and symptoms may last for as long as three months. **Fatigue** and muscle pain (myalgia) may take several more months to subside.

Diagnosis

An initial diagnosis of trichinosis relies heavily on the presence of its classic symptoms—swelling around the eyes, muscle inflammation, fever, and high levels of a certain type of white blood cell (eosinophils)—coupled with the patient's history. If the patient reports having eaten undercooked meat from an animal known to be a potential carrier of trichinosis, the doctor may order a muscle biopsy to confirm the diagnosis. By the third or fourth week of infection, muscle biopsies usually indicate the presence of larvae. Stool tests rarely reveal adult worms, although larvae can sometimes be found in blood or duodenal washings after the second week of infection. The blood test that is the most specific for trichinosis is the bentonite flocculation (BF) test.

T. spiralis can infect a number of different animal species used for food. The most common food culprit in the United States has been pork sausage, while outbreaks

in Europe have been caused by wild boar and horse meat. Outbreaks of trichinosis in Asia and Africa have been traced to dog meat, and outbreaks in Northern Canada have resulted from consumption of walrus and bear meat.

Treatment

Supportive care

Treatment of trichinosis is primarily aimed at decreasing the severity of the symptoms. Symptomatic relief includes bed rest and medications to relieve fever and muscle pain. The medications most commonly given are **aspirin** and **nonsteroidal anti-inflammatory drugs** (NSAIDs). Steroids such as prednisone (Deltasone, Meticorten) are reserved for the most severe cases of muscle inflammation, or for complicated cases that include myocarditis.

Anthelmintic medications

In addition to medications for pain relief, trichinosis can be treated with drugs that are called anti-worm medications or anthelmintics. Two related anti-worm medications, mebendazole (Vermox) and thiabendazole (Mintezol), have been reported to be effective against intestinal larvae, but not against larvae encysted in the muscles. In particular, thiabendazole has worked best when given to patients who knew within 24 hours that they had eaten infested meat. Thiabendazole has, however, anti-inflammatory properties that can relieve some of the pain during the muscle stage of trichinosis.

Prognosis

The prognosis for recovery from trichinosis is generally good. Most people with the disease are unaware that they have even been infected. It is estimated that between 150,000 and 300,000 people in the United States become infected yearly, so that at any given time, 1.5 million people have *T. spiralis* infections. Most of these people have such light cases that trichinosis is never identified. Worm burden is measured in larvae per gram of muscle tissue; people with 10 or fewer larvae per gram of muscle tissue usually have no significant symptoms. When the number climbs to 100 larvae per gram of muscle tissue, the symptoms become noticeable. People with over 1000 larvae per gram of muscle tissue are usually extremely ill, and often die. The mortality rate of trichinosis is about 1%.

Prevention

Prevention of trichinosis is relatively simple. Swine should be fed only grain or cooked garbage because

KEY TERMS

Anthelminthic—A type of medication that is given to destroy or eliminate parasitic worms.

Cyst—In the life cycle of the round worm, a protective, walled-off capsule in which the larvae lie dormant.

Embryonic—In the life cycle of the round worm, a very early life stage occurring within the uterus of the female round worm.

Host—The animal within which a parasite lives, and from which the parasite receives its nutrition.

Inflammation—A reaction within the body to an invader (virus, bacteria, fungus, worm, etc.) or to tissue injury. The classic signs of inflammation include redness, heat, pain, and loss of function.

Larva—In the life cycle of the round worm, the second stage of life, sometimes considered the "adolescent" stage.

Nematode—A type of roundworm with a long, unsegmented body, usually parasitic on animals or plants.

Striated muscle—Also known as striped muscle; it includes muscles of the skeletal system and of the heart.

Trichina—An individual example of *Trichinella spiralis*.

uncooked garbage may contain contaminated pork scraps. Meat from animals prone to trichinosis infection should be cooked or smoked thoroughly until it is no longer pink. Freezing meat at an adequately low temperature (5°F/–15°C for three weeks) can kill most encysted larvae, except for species which infect such arctic mammals as walrus or bear.

Resources

BOOKS

- Plorde, James J. "Trichinella." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.
 Stoffman, Phyllis. *The Family Guide to Preventing and Treating 100 Infectious Diseases*. New York: John Wiley & Sons, 1995.

PERIODICALS

- Stack, Peter S. "Trichinosis: Still a Public Health Threat." *Post-graduate Medicine* 97, no. 6 (June 1995): 137+.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Trichomonas vaginalis infection see
Trichomoniasis

Trichomoniasis

Definition

Trichomoniasis refers to an infection of the genital and urinary tract.

Description

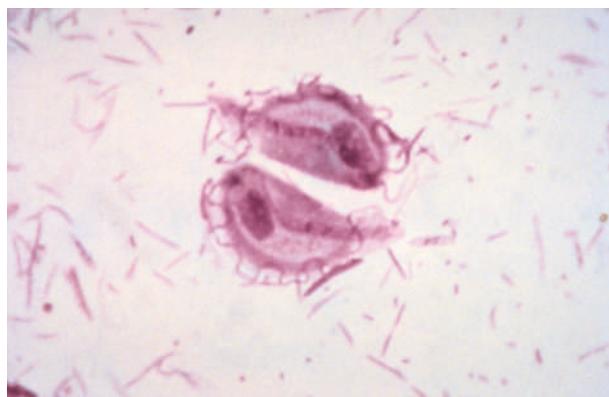
Trichomoniasis is caused by a protozoan (the smallest, single-celled members of the animal kingdom). *Trichomonas vaginalis* is passed almost 100% of the time through sexual contact. Trichomoniasis is primarily an infection of women's vaginal and urinary tracts. A woman is most susceptible to infection just after having completed her menstrual period. Men may carry the organism unknowingly, since infection in men may cause mild or no symptoms.

Causes and symptoms

Because trichomoniasis is a sexually transmitted disease, it occurs more often in individuals who have multiple sexual partners. The protozoan is passed to an individual by contact within the body fluids of an infected sexual partner. It often occurs simultaneously with other sexually transmitted diseases, especially gonorrhea.

In women, the symptoms of trichomoniasis include an unpleasant vaginal odor, and a heavy, frothy, yellow discharge from the vagina. The genital area (vulva) is often very itchy, and there is frequently pain with urination or with sexual intercourse. The labia (lips) of the vagina, the vagina itself, and the cervix (the narrowed, lowest segment of the uterus which extends into the upper part of the vagina) will be bright red and irritated.

In men, there are usually no symptoms at all. Occasionally, a man will notice a small amount of yellowish discharge from his penis, usually first thing in the morning. There may be some mild discomfort while urinating.



A close up image of *Trichomonas vaginalis*, the parasite that causes vaginitis in humans. (Custom Medical Stock Photo. Reproduced by permission.)

Diagnosis

Diagnosis is easily made by taking a sample of the discharge from the women's vagina, or from the opening of the man's penis. The sample is put on a slide, and viewed under a microscope. The protozoa, which are able to move about, are easily viewed.

Treatment

The usual treatment is a single large dose of metronidazole, or split doses over the course of a week. Sexual partners of an infected individual must all be treated, to prevent the infection being passed back and forth.

Alternative treatment

Cure of trichomoniasis may be difficult to achieve with alternative treatments. Some practitioners suggest eliminating sweets and carbohydrates from the diet and supplementing with antioxidants, including vitamins A, C, and E, and zinc. Naturopaths may recommend treatment with two douches (a wash used inside the vagina), alternating one in the morning and one at bedtime. One douche contains the herbs calendula (*Calendula officinalis*), goldenseal (*Hydrastis canadensis*), and echinacea (*Echinacea spp.*); the other douche contains plain yogurt. The herbal douche helps to kill the protozoa, while the yogurt reestablishes healthy flora in the vagina. Acidifying the vagina by douching with boric acid or vinegar may also be useful.

Prognosis

Prognosis is excellent with appropriate treatment of the patient and all sexual partners. Without treatment, the infection can smolder on for a very long time, and can be passed to all sexual partners.

Prevention

All sexually transmitted diseases can be prevented by using adequate protection during sexual intercourse. Effective forms of protection include male and female condoms.

Resources

BOOKS

Nash, Theodore E., and Peter F. Weller. "Protozoal Intestinal Infections and Trichomoniasis." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Plorde, James J. "Introduction to Pathogenic Parasites: Pathogenesis and Chemotherapy of Parasitic Diseases." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

PERIODICALS

Policar, Michael S. "Genital Tract Infections: How Best to Treat Trichomoniasis, Bacterial Vaginosis, and *Candida* Infection." *Consultant* 36 (Aug. 1996): 1769+.

Walling, Anne D. "Lowest Metronidazole Dose for Trichomonas Vaginitis." *American Family Physician* 56 (1 Sept. 1997): 948+.

Rosalyn Carson-DeWitt, MD

Trichotillomania see **Alopecia**

Trichuriasis see **Roundworm infections**

Tricuspid incompetence see **Tricuspid valve insufficiency**

Tricuspid regurgitation see **Tricuspid valve insufficiency**

Tricuspid stenosis see **Tricuspid valve stenosis**

Tricuspid valve insufficiency

Definition

Tricuspid valve insufficiency occurs when a tricuspid valve does not close tightly enough to prevent leakage. This condition is also called tricuspid valve regurgitation and tricuspid incompetence.

Description

The tricuspid valve is located between the right atrium and the right ventricle of the heart. When the right ventricle contracts, it is supposed to pump blood forward into the lungs. If the tricuspid valve does not close tight-

KEY TERMS

Atrial fibrillation—A rapid, uncoordinated quivering of the upper chamber of the heart.

Atrium—The upper chamber of the heart.

Pulmonary valve—The valve at the opening from the right ventricle to the artery that leads to the lungs.

ly, some of that blood leaks back into the right atrium. When the atrium receives its usual quantity of blood from veins leading to the heart, plus the leaking blood, the pressure inside the atrium increases. This higher pressure creates resistance to the flow of blood in the veins that enter the atrium from the body. In addition, this increase in pressure causes the right atrium to enlarge over time. Congestion from fluid buildup occurs, particularly in the liver and legs.

Causes and symptoms

If a person has serious lung disease or a narrowing of the pulmonary valve, the right ventricle must pump harder to force the blood through the pulmonary valve. In order to pump harder, the right ventricle enlarges and the valve opening stretches, causing the valve to leak.

Tricuspid valve insufficiency usually produces such vague symptoms as general weakness and **fatigue**. As the conditions worsens, a person experiences **pain** in the upper right part of the abdomen, caused by a congested and enlarged liver. The legs may also swell (**edema**).

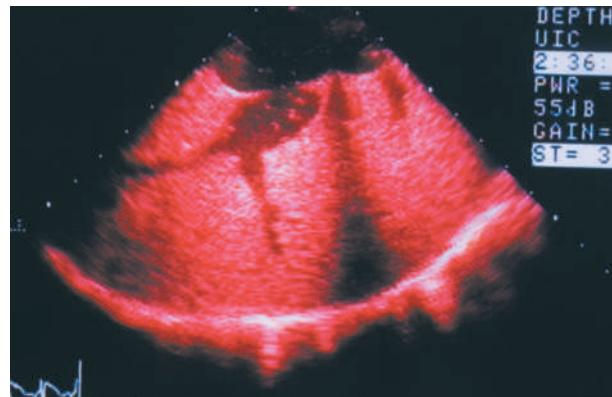
An enlarged right atrium can cause atrial fibrillation (the atria flutter, rather than pumping in a regular rhythm) and severe tricuspid regurgitation of blood, which can eventually lead to congestive **heart failure**.

Diagnosis

A leaky valve can be heard with a stethoscope; the sound is called a heart murmur. Additional support for diagnosing tricuspid valve insufficiency comes from a medical history, physical exam, and **chest x ray**. Further testing with **echocardiography**, to show an image of the leakage and its severity, is the most helpful diagnostic test for this condition.

Treatment

Tricuspid valve insufficiency itself usually does not require treatment, since a tiny leakage occurs in most



This echocardiogram of the heart shows tricuspid valve insufficiency. (Custom Medical Stock Photo. Reproduced by permission.)

normal people. In certain cases, however, if there is underlying pulmonary valve disease or lung disease, those conditions should be treated.

If irregular heart rhythms or heart failure are present, they are usually treated independently of the valve insufficiency.

Since a person with known tricuspid valve insufficiency is at risk for infections of the heart, **antibiotics** should be taken before and after oral or dental surgery, or urologic procedures.

Prognosis

Tricuspid valve insufficiency is not usually considered to be serious. If it is the result of other cardiopulmonary disease, the extent of those conditions effect the prognosis.

Prevention

In general, tricuspid valve insufficiency cannot be prevented.

Resources

BOOKS

McGoon, Michael D., ed. *Mayo Clinic Heart Book: The Ultimate Guide to Heart Health*. New York: William Morrow and Co., Inc., 1993.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

Dorothy Elinor Stonely

Tricuspid valve stenosis

Definition

Tricuspid valve stenosis is a narrowing or stiffening of the opening in the valve. This stenosis causes increased resistance to blood flow through the valve.

Description

The tricuspid valve is located between the right atrium and the right ventricle of the heart. It is the largest of the four valves in the heart. When the tricuspid valve is narrowed or stiffened, it decreases the amount of blood that can flow through it. This decrease raises the pressure in the right atrium and causes the atrium to enlarge. It also causes the right ventricle to shrink, and lowers the cardiac output.

Causes and symptoms

Tricuspid valve stenosis is most often the result of **rheumatic fever**. On rare occasions, it is caused by a tumor or disease of the connective tissue. The rarest cause is a birth defect.

A person with tricuspid valve stenosis may experience generalized weakness and **fatigue**. Many people have **palpitations** and can feel fluttering in their neck. Over time, there may be **pain** in the upper right abdomen, due to increased congestion and enlargement of the liver.

Diagnosis

The noise produced by blood trying to flow through a stenotic valve can be heard with a stethoscope, and is referred to as a murmur. An x ray of the chest will show the right atrium to be enlarged. Further support for this diagnosis is found on an echocardiogram of the heart, which will show an image of the stenotic valve and measure its severity.

Treatment

Tricuspid valve stenosis itself usually doesn't require treatment. However, if there is damage to other valves in the heart as well, then surgical repair or replacement must be considered.

Since a person with known tricuspid valve stenosis is at risk for infections of the heart, **antibiotics** should be taken before and after oral or dental surgery, or urologic procedures.

KEY TERMS

Rheumatic fever—An inflammatory illness that can follow strep throat, and could cause heart damage.

Prognosis

Mild tricuspid valve stenosis is not usually considered cause for surgery. The decision to repair or replace the tricuspid valve is often based on the health of the aortic and mitral valves, rather than on the severity of stenosis in the tricuspid valve.

Prevention

Rheumatic fever, the usual cause of tricuspid valve stenosis, has almost disappeared in North America and western Europe. Therefore, the number of people who acquired this condition in childhood will decline over time.

Resources

BOOKS

McGoon, Michael D., ed. *Mayo Clinic Heart Book: The Ultimate Guide to Heart Health*. New York: William Morrow and Co., Inc., 1993.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

Dorothy Elinor Stonely

Tricyclic antidepressants see
Antidepressants, tricyclic

Trigeminal neuralgia

Definition

Trigeminal neuralgia is a disorder of the trigeminal nerve (the fifth cranial nerve) that causes episodes of sharp, stabbing **pain** in the cheek, lips, gums, or chin on one side of the face.

Description

The trigeminal nerve, which is divided into three branches, is responsible for chewing, for producing sali-

va and tears, and for sending facial sensations to the brain. When this nerve breaks down for some reason, it can trigger brief but agonizing sizzles of pain on one side of the face.

This condition is unusual in those under age 50 and more often occurs after 70. Women are three times more likely to have the condition than are men. When trigeminal neuralgia does occur in younger people, it is often associated with **multiple sclerosis**.

The pain, while brief, is so severe that the sufferer often can't do anything else while the attack lasts. People with this pain often wince or twitch, which is where trigeminal neuralgia gets its French nickname *tic douloureux*, meaning "painful twitch."

Causes and symptoms

The origin of trigeminal neuralgia is not certain, but scientists believe it may be caused by degeneration, pressure, or irritation of the trigeminal nerve. Some doctors believe the pain may be triggered by pressure from a nearby abnormally-formed artery lying too close to the nerve.

Any part of the three branches of the trigeminal nerve may be affected. Neuralgia of the first branch leads to pain around the eyes and over the forehead; the second branch causes pain in the upper lip, nose and cheek; the third branch causes pain on the side of the tongue and lower lip.

The first episodes are usually fairly mild and brief, and it may be minutes, hours, or weeks before the next attack. However, attacks tend to occur in clumps that may last for weeks at a time. As the sufferer ages, the episodes become more frequent and painful, until the person begins to live in constant fear of the next one.

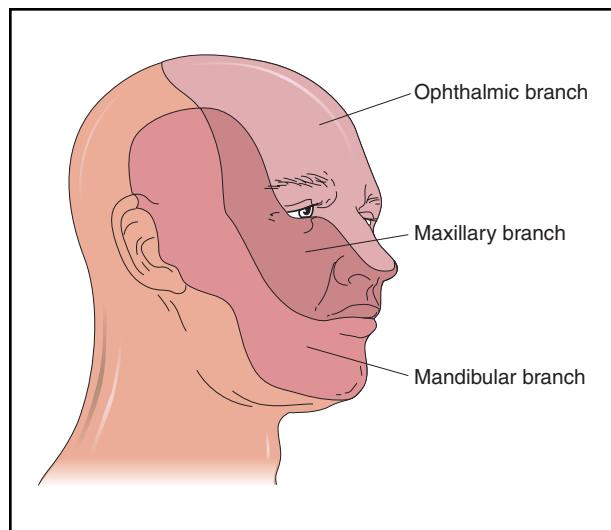
The momentary bursts of pain usually begin from the same spot on the face each time. The pain can be triggered by touching the area, washing, shaving, eating, drinking, or even talking. Even a cool breeze across the face can set off an attack. Pain is more severe at the ends of the affected nerve, especially over the lip, chin, nostrils, or teeth.

Diagnosis

Diagnosis is usually made by eliminating other problems that could cause similar pain in teeth, jaw, head, or sinuses. Because patients with the condition tend to avoid trigger points, avoiding chewing, shaving, touching or washing their faces can be a clue to diagnosis of trigeminal neuralgia.

Treatment

It is not easy to treat trigeminal neuralgia. Pain can be suppressed by a range of medicines, including the anti-



Trigeminal neuralgia is a disorder of the trigeminal nerve (which is divided into three branches, as illustrated above) that causes episodes of sharp, stabbing pain in the cheek, lips, gums, or chin on one side of the face. The origin of this disorder is not certain, but scientists believe it may be caused by degeneration, pressure, or irritation of the trigeminal nerve. (Illustration by Electronic Illustrators Group.)

epilepsy medicines carbamazepine (Tegretol) or phenytoin (Dilantin). These drugs slow down the nerve signals at certain nerve terminals, which eases the pain. However, these drugs cause a wide range of side effects, including nausea, **dizziness**, drowsiness, liver problems, and skin **allergies**. Some people develop resistance to the drugs or they can't tolerate the high dosage needed to control the discomfort. If the medicines are stopped, the pain usually returns.

If drug treatment fails, surgical treatment to block pain signals from the nerve may be effective. Radio-frequency waves, gamma rays, or glycerol injections can deaden the nerve (and hence the pain). An operation that frees the nerve from whatever is compressing it (blood vessel or tumor) can permanently relieve pain, but this major neurosurgical procedure carries its own risks and complications. Alternatively, a new procedure seeks to place a cushioning sponge between the nerve and a pulsating artery wrapping around it to soothe the irritated nerve.

Prognosis

Although the pain is momentarily incapacitating, it's not life-threatening. As the person ages, the attacks can be expected to occur more and more frequently.

Prevention

While the condition itself can't be prevented, there are a number of things patients can do to avoid triggering attacks:

KEY TERMS

Multiple sclerosis—A progressive disease of the central nervous system in which the coverings of nerves in the brain and spinal cord are destroyed.

- wash with cotton pads and warm water over the face
- rinse the mouth with water after eating, if toothbrushing triggers pain
- eat and drink food and beverages at room temperature
- chew on the unaffected side
- eat soft foods, if eating is becoming a problem

Resources

BOOKS

Greenberg, David A., et al. *Clinical Neurology*. 2nd ed. Norwalk, CT: Appleton & Lange, 1993.

ORGANIZATIONS

Chronic Pain Outreach. 822 Wycliff Ct., Manassas, VA 22110. (703) 368-7357.

National Chronic Pain Outreach Association, Inc. 4922 Hampden Lane, Bethesda, MD 20814. (301) 652-4948.

National Institute of Neurological Disorders and Stroke. P.O. Box 5801, Bethesda, MD 20824. (800) 352-9424. <<http://www.ninds.nih.gov/index.htm>>.

Trigeminal Neuralgia Association. P.O. Box 785, Barnegat Light, NJ 08006. (609) 361-1014.

Carol A. Turkington

Trigger finger

Definition

Trigger finger is the popular name of stenosing tenosynovitis, a painful condition in which a finger or thumb locks when it is bent (flexed) or straightened (extended).

Description

Tendons are tough, fibrous cords that connect muscles to bones. Tendons must slide easily through their protective coverings (tendon sheaths). The finger and thumb bones have tendons that are responsible for bending and straightening the fingers. Problems start when a tendon sheath narrows (stenosis) and the outer covering

of the tendon becomes inflamed (tenosynovitis). The tendon swells because of the constriction, sometimes forming a nodule, and is no longer able to move smoothly through its sheath. As a result, a finger may lock in an upward position as the person tries to straighten it. The condition usually happens in the ring and middle fingers and is more common in women, typically over age 30. In infants and small children, the condition generally occurs in the thumb.

Causes and symptoms

Trigger finger is often an overuse injury because of repetitive or frequent movement of the fingers. Trigger finger may happen because a person performs the same manipulation over and over on a job, from squeezing and gripping during a weekend of heavy pruning and gardening, or from such hobbies as playing a musical instrument or crocheting. Trigger finger may also result from trauma or accident. The symptoms of trigger finger are **pain** in the fingers and “popping” sensations. Sometimes the finger may lock down into the palm or lock out straight. Symptoms are usually worse in the morning and improve during the day.

Diagnosis

The diagnosis of trigger finger and thumb is obvious on **physical examination**. Often there is a click that can be felt as the nodule passes through the sheath. Most cases are uncomplicated although X rays are often taken to rule out other injuries or disease such as arthritis.

Treatment

Initial treatment for mild or infrequent symptoms of trigger finger include rest, avoiding or modifying those activities that caused the inflammation, and the use of a nonsteroidal anti-inflammatory drug (NSAID) such as ibuprofen. This may relieve the swelling and inflammation that resulted in the constriction of the sheath and the restriction of the tendon. Injection of a steroid medication (cortisone) into the tendon sheath is the next option to treat trigger finger. Depending on the severity, there may be one more injection a week later. Two-thirds of patients improve after one injection. Some physicians will splint the finger in extension after the injection.

In severe cases that do not respond to injections and the finger or thumb remains in a locked position, surgery may be required to relieve the symptoms. A local anesthetic is used for the surgical procedure performed on an outpatient basis. An incision is made by a surgeon in the palm of the hand at the base of the affected finger or thumb to relieve the constriction of the tendon. Recovery

KEY TERMS

Microcirculation—The passage of blood in the smallest blood vessels of the body, such as the capillaries in the hand and fingers.

Myofascial—The fibrous tissue that encloses and separates layers of muscles.

Nodule—A swelling or knob that may form on a tendon and make it difficult to slide smoothly through its sheath.

Stenosis—Narrowing of a passageway or opening in the body. In trigger finger it is the tendon sheath that narrows.

Synovial tendon sheath—Where the tendons cross joints, they are sheathed in thin membranes known as synovium, which provide lubrication to decrease friction.

Tendon sheath—A membrane covering a tendon.

Tenosynovitis—Inflammation of a tendon and its enveloping sheath, usually resulting from overuse injury.

may take up to four weeks. Sometimes physical therapy of the hand is required after surgery to regain good use.

Alternative treatment

Treatment should begin when a person starts having difficulty moving the fingers. If started early, noninvasive measures have a good chance for success. Alternative treatments include **acupuncture** to facilitate healing and microcirculation, pulsed ultrasound, and myofascial release work for the affected area.

Prognosis

At least half of cases can be cured non-surgically. The key to successful treatment is early intervention. A mistake people make is trying to work through the pain. Diabetics have a higher incidence of the condition and are sometimes left with a disability.

Prevention

Taking frequent breaks from a repetitive activity will do much to prevent the condition. Depending on the intensity, that may mean a 10 minute break every hour from the repetitive activity. The break should be spent stretching the hands and arms and generally moving around.

Resources

PERIODICALS

“Ask the Mayo Physician.” *HealthOasis Mayo Clinic* (May 4, 2000).

Phillips, D. F. “New Paradigms Sought to Explain Occupational and Environmental Disease.” *JAMA* (January 6, 1999).

Stroud, R. “Minimally Invasive Surgical Techniques of the Hand and Upper Extremities.” *Orthopedic Technology Review* (September 2000):18.

ORGANIZATIONS

American Society for Surgery of the Hand. 6300 N. River Rd., Suite 600, Rosemont, IL 60018. <<http://www.hand-surg.org>>.

OTHER

Jameson DC, CCSP, Timothy J. “Explanation, Treatment, and Prevention of Trigger Finger.” *GuitarBase Articles*. <<http://www.gbase.com/articles/med/med4.html>>.

Ruthan Brodsky

Triglycerides test

Definition

Triglycerides test is a blood test to determine the amount of triglycerides, a form of fat, in the blood.

Purpose

The triglycerides test is one of the screening tests for excess lipids (fats) in the blood. It is usually part of an evaluation of risk factors for heart disease.

Description

Triglycerides are a form of fat that comes from foods. They can also be made and stored in the body and are used as an energy source. High levels of triglycerides in the blood can mean that there is too much fat in the diet. Hypertriglyceridemia (high levels of triglycerides) is associated with coronary heart disease, especially since elevated triglycerides levels are often associated with unhealthy low levels of hyper-density lipoproteins (the “good” cholesterol), which are necessary for good health.

Preparation

For triglycerides testing, blood is drawn from a vein in the arm. A vein at the inside of the elbow or on the back of the hand is usually selected. The area where the needle will be inserted is cleaned with antiseptic. A small needle is inserted through the skin and into the vein,

allowing a small amount of blood to flow into a collection tube or syringe. Once the blood is collected, the needle is removed from the puncture site.

Before the blood test, the patient may be required to refrain from eating food for eight to 12 hours. Patients should not drink alcohol for 24 hours before the test. Some drugs may affect the test and the patient may be asked to cease taking certain medications before the test. **Oral contraceptives**, estrogen, and cholestyramine (a drug used to treat **high cholesterol**) can increase triglyceride levels. Ascorbic acid (vitamin C), asparaginase (an enzyme), and various drugs used to treat high blood lipids, can decrease blood triglyceride levels. These substances should not be taken prior to this test.

Aftercare

After the blood sample has been taken and the needle withdrawn from the puncture site, a cotton ball or gauze pad may be placed over the site and direct pressure applied to reduce bleeding. A piece of surgical tape or gauze adhesive bandage strip may be secured over the site to prevent further bleeding.

Risks

There is a very small risk that the puncture site may bleed excessively, a bruise or infection may develop at the site, or it may take several punctures to locate a vein. Some patients may feel faint or lightheaded when blood is drawn.

Normal results

The normal range of triglycerides in the blood depends on the age and gender of the patient. Women naturally have higher levels of triglycerides than men. **Pregnancy** can also increase triglyceride levels. As people age and gain weight, triglyceride levels generally increase. For adults, a normal level is considered to be less than 200 mg/dL (milligrams per deciliter). Levels from 200–400 mg/dL are considered borderline high.

Abnormal results

Triglyceride levels ranging from 400–1000 mg/dL are considered high and levels greater than 1000 mg/dL are considered very high. High levels of triglycerides may indicate liver disease (**cirrhosis**), an underactive thyroid problem, uncontrolled diabetes, an infection of the pancreas (**pancreatitis**), kidney disease, or a diet too low in protein and too high in carbohydrates.

Extremely low triglycerides levels (less than 10 mg/dL) can also indicate a problem. Low levels may

indicate **malnutrition** (not enough nutrients in the diet), malabsorption (inadequate absorption of nutrients in the intestinal tract), a diet too low in fat, or an overactive thyroid problem.

Resources

BOOKS

"Cholesterol and Its Health Hazards." In *The Consumer's Medical Desk Reference*, ed. Charles B. Inlander, et al. New York, NY: Stonesong Press, 1995.

"Primary & Secondary Prevention of Ischemic Heart Disease" and "High Blood Triglycerides." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford, CT: Appleton & Lange, 1997.

OTHER

"Triglyceride levels." *HealthAnswers.com* <<http://www.healthanswers.co>>.

"Triglycerides." *ThriveOnline*. <<http://thriveonline.oxygen.com>>.

Altha Roberts Edgren

Triiodothyronine test see **Thyroid function tests**

Triplets see **Multiple pregnancy**

Trisomy 13 see **Patau's syndrome**

Trisomy 18 see **Edwards' syndrome**

Trisomy G syndrome see **Down syndrome**

Trofloxacin see **Fluoroquinolones**

Tropical spastic paraparesis

Definition

Tropical spastic paraparesis (TSP) is an incurable viral infection of the spinal cord that causes weakness in the legs. It is caused by the human T-cell lymphotropic virus-1 (HTLV-1) retrovirus.

Description

As the name implies, tropical spastic paraparesis usually occurs in tropical locales. Although isolated cases have been diagnosed in the southeastern United States and other places in the United States, TSP is most frequently found in:

- the Caribbean
- Japan
- the Seychelles Islands

- regions of South America
- western Africa

TSP usually affects adults between the ages of 30 and 40, and is far more common in women than in men.

The disease may remain undetected for years after infection is contracted. When the immune system's response to the virus causes nerve damage, the legs gradually lose strength and flexibility.

Causes and symptoms

TSP is caused by the HTLV-1 virus, which also causes leukemia. The virus can be spread through the placenta, and also through blood transfusions, breastfeeding, contaminated needles, and sexual contact.

Symptoms may begin years after infection. In response to the infection, the body's immune response may injure nerve tissue, causing symptoms that include bladder abnormalities, leg **pain**, loss of feeling in the feet, tingling sensations, and unpleasant sensations when the skin is touched.

As many as 20% of patients with TSP may also experience:

- deafness
- double vision
- the tendency to incorrectly estimate the amount of motion necessary to accomplish a specific task (dysmetria)
- exaggerated reflexes
- facial paralysis
- tremor

Diagnosis

Infectious disease specialists use blood tests and **magnetic resonance imaging** (MRI) of the spinal cord to diagnose this condition.

Treatment

While the disease is incurable, significant improvement has been reported in the condition of TSP patients treated with **corticosteroids**. These drugs are believed to alleviate symptoms by suppressing the immune system's response to the virus that causes them.

Plasmapheresis, a dialysis-like procedure in which symptom-producing antibodies are removed from the blood, also provides temporary relief.

Prognosis

As noted, TSP cannot be cured.

KEY TERMS

Retrovirus—A family of RNA viruses containing a reverse transcriptase enzyme which allows the viruses' genetic information to become part of the genetic information of the host cell upon replication.

Virus—A microorganism, smaller than bacteria, which can only replicate within the a cell of a living plant or animal. The virus provides the genetic code and the host cell provides the energy and raw materials for replication.

Prevention

The United States Food and Drug Administration (FDA) has approved screening procedures developed to detect HTLV-1 in donated blood and blood products designated for **transfusion**. These procedures, which can also be used to diagnose patients with TSP, are designed to prevent the spread of the disease.

Resources

BOOKS

Harrison's Principles of Internal Medicine. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

OTHER

"Current Trends Licensure of Screening Tests for Antibody to Human T-Lymphotropic Virus Type I." *Centers for Disease Control*. 27 May 1998 <<http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00001311.htm>>.

Maureen Haggerty

Tropical sprue see **Malabsorption syndrome**

Troponins test

Definition

Troponins are specific proteins found in heart muscle. Troponin testing is done to diagnose heart attacks (myocardial infarctions).

Purpose

When heart muscle is damaged, as in a myocardial infarction (MI), troponins leak out of cells and into the

bloodstream. Increased troponin levels indicate myocardial infarction or injury in a person with chest **pain** or pressure. Some MIs are silent, manifesting few if any symptoms.

If infarction is ruled out in a person with continuing or recurring chest pain (unstable **angina**), an increased troponin level indicates the person has heart muscle **ischemia** (a decreased supply of oxygenated blood to the body), and is at an increased risk for a future serious heart event.

Description

Although troponins also exist in other muscles, those in the heart are unique, and are measured separately in laboratory tests. Troponins in the heart are called cardiac troponins. There are two main types of cardiac troponins; T and I. T is also referred to as cTnT, while I is also referred to as cTnI.

Both troponin T and I are cardiac markers used to diagnose myocardial infarctions. Cardiac markers are substances whose blood levels increase after a myocardial infarction. Others include CK (creatinine kinase), myoglobin, and CK-MB (one of three CK isoenzymes).

Like all cardiac markers, troponins have a unique diagnostic window (the timeline during which the marker rises, peaks, and returns to normal). Troponin levels rise within four to six hours after the beginning of chest pain or heart damage, and stay elevated for at least one week. This long elevation allows detection of a myocardial infarction that occurred days earlier, but prevents detection of a second infarction if it occurred only days after the first.

Troponins I and T are considered superior cardiac markers for several reasons. The most significant is that cardiac troponins are the only markers specific for heart muscle. Other markers also increase following damage to other muscles. Troponin levels help predict the extent of heart muscle damage; higher levels are associated with increased damage, lower levels with less damage. Levels in a healthy person are negligible, so an increase is easily detected.

The main difference between troponins I and T is that cardiac troponin I tests measure only cardiac troponin; tests for cardiac troponin T may cross-react with troponin found in other muscles and give positive or increased results in the absence of heart damage.

Two types of tests for troponins T and I are available: a traditional quantitative test that provides an actual measurement of troponin, and a newer qualitative test that simply reports the result as positive or negative. The quantitative test takes 45–90 minutes, and helps distin-

KEY TERMS

Angina—A temporary chest pain caused by the heart not receiving enough oxygen.

Cardiac marker—A substance in the blood whose levels rises following a myocardial infarction.

Myocardial infarction—Commonly known as a heart attack, a myocardial infarction is an episode in which some of the heart's blood supply is severely cut off or restricted, causing the heart muscle to suffer and die from lack of oxygen.

guish between myocardial infarction and unstable angina. The qualitative test takes 15 minutes and is used in emergency rooms in which rapid patient care decisions can be made based on the presence or absence of troponins.

Preparation

Troponins tests require 5 mL of blood. Collection of the sample takes only a few minutes.

Aftercare

Discomfort or bruising may occur at the puncture site or the person may feel dizzy or faint. Pressure to the puncture site until the bleeding stops reduces bruising. Warm packs to the puncture site relieve discomfort.

Normal results

People without heart damage have troponin levels less than 0.5 ng/mL.

Abnormal results

Levels greater than 2.0 ng/mL indicate a person has had a significant myocardial injury, such as an infarction, and is at an increased risk for future serious heart events. Levels between 0.5 and 2.0 ng/mL indicate a diagnosis of unstable angina, other heart disorders, or **chronic kidney failure**.

Resources

BOOKS

Wu, Alan, ed. *Cardiac Markers*. Washington, DC: American Association of Clinical Chemistry (AACC) Press, 1998.

PERIODICALS

Brown, Chris S., and Barry D. Bertolet. "Cardiac Troponin. See Ya Later, CK!" *Chest* (Jan. 1997): 2-4.

- Hamm, Christian W., et al. "Emergency Room Triage of Patients With Acute Chest Pain by Means of Rapid Testing for Cardiac Troponin T or Troponin I." *The New England Journal of Medicine* (4 Dec. 1997): 67-78.
- Wong, Shan S. "Strategic Utilization of Cardiac Markers for the Diagnosis of Acute Myocardial Infarction." *Annals of Clinical and Laboratory Science* (July 1996): 301-312.

Nancy J. Nordenson

Trypanosoma cruzi infection see **Chagas' disease**

TSS see **Toxic shock syndrome**

Tsutsugamushi fever see **Scrub typhus**

Tubal ligation

Definition

Tubal ligation is a permanent voluntary form of birth control (**contraception**) in which a woman's Fallopian tubes are surgically cut or blocked off to prevent **pregnancy**.

Purpose

Tubal ligation is performed in women who definitely want to prevent future pregnancies. It is frequently chosen by women who do not want more children, but who are still sexually active and potentially fertile, and want to be free of the limitations of other types of birth control. Women who should not become pregnant for health concerns or other reasons may also choose this birth control method. Tubal ligation is one of the leading methods of contraception, having been chosen by over 10 million women in the United States—about 15% of women of reproductive age. The typical tubal ligation patient is over age 30, is married, and has had two to three children.

Precautions

Tubal ligation should be postponed if the woman is unsure about her decision. While it is sometimes reversible, the procedure should be considered permanent and irreversible. Up to 10% of sterilized women regret having had the surgery, and about 1% seek treatment in attempts to restore fertility.

Description

Tubal ligation, or getting one's "tubes tied," refers to female sterilization, the surgery that ends a woman's ability

to conceive. The operation is performed on the patient's Fallopian tubes. These tubes, which are about 10 cm long and 0.5 cm in diameter, are found on the upper outer sides of the uterus, and open into the uterus through small channels. It is within the Fallopian tube that fertilization, the joining of the egg and the sperm, takes place. During tubal ligation, the tubes are cut or blocked in order to close off the sperm's access to the egg.

Normally, tubal ligation takes about 20–30 minutes, and is performed under general anesthesia, spinal anesthesia, or local anesthesia with **sedation**. The surgery can be performed on either hospitalized patients within 24 hours after **childbirth** or on outpatients. The woman can usually leave the hospital the same day.

The most common surgical approaches to tubal ligation include **laparoscopy** and mini-laparotomy. In a laparoscopic tubal ligation, a long, thin telescope-like surgical instrument called a laparoscope is inserted into the pelvis through a small cut about 1 cm long near the navel. Carbon dioxide gas is pumped in to help move the abdominal wall to give the surgeon easier access to the tubes. Often the surgical instruments are inserted through a second incision near the pubic hair line. An instrument may be placed through the vagina to hold the uterus in place.

In a mini-laparotomy, a 3–4 cm incision is made just above the pubic bone or under the navel. A larger incision, or laparotomy, is rarely used today. Tubal ligation can also be performed at the time of a **cesarean section**.

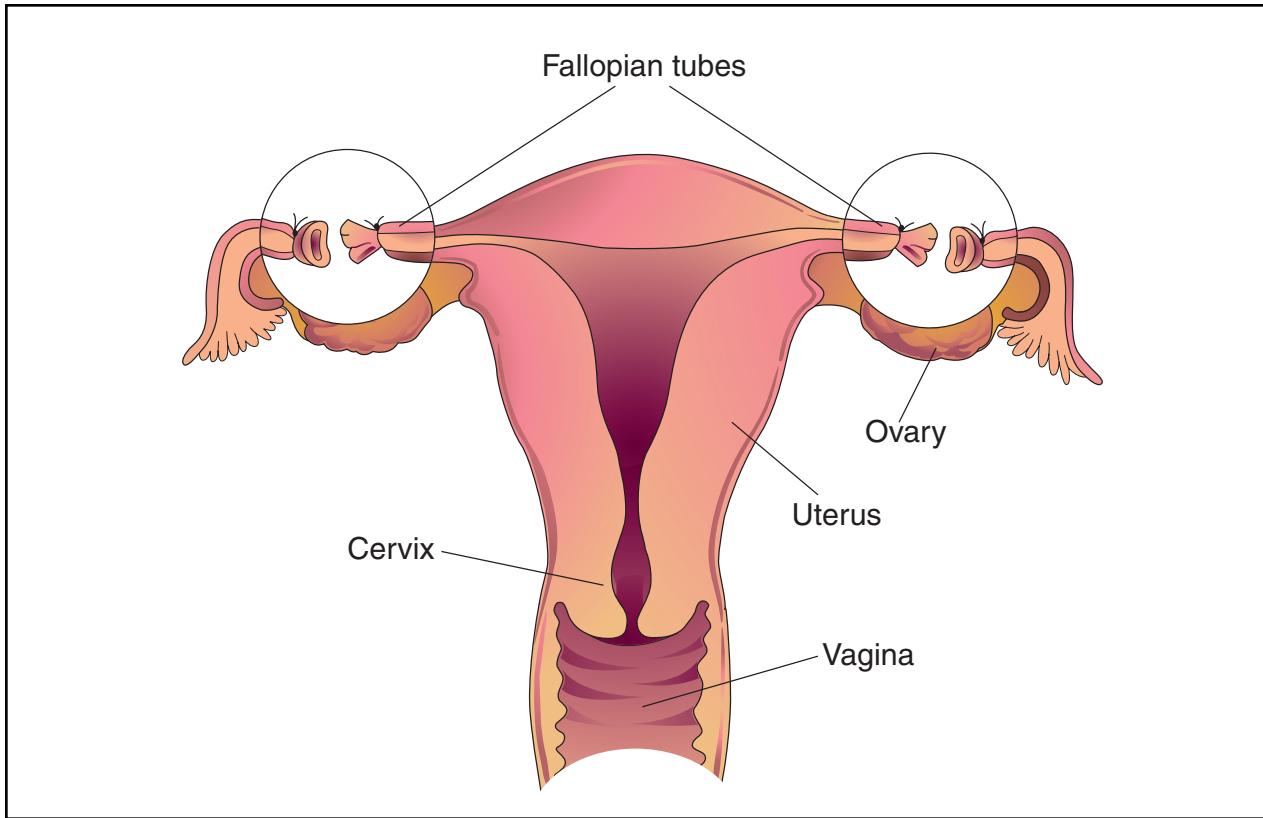
Tubal ligation costs about \$2,000 when performed by a private physician, but is less expensive when performed at a family planning clinic. Most insurance plans cover treatment costs.

Tubal ligation is performed in several ways:

- **Electrocoagulation.** A heated needle connected to an electrical device is used to cauterize or burn the tubes. Electrocoagulation is the most common method of tubal ligation.
- **Falope ring.** In this technique, an applicator is inserted through an incision above the bladder and a plastic ring is placed around a loop of the tube.
- **Hulka clip.** The surgeon places a plastic clip across a tube held in place by a steel spring.
- **Silicone rubber bands.** A band placed over a tube forms a mechanical block to sperm.

Preparation

Preparation for tubal ligation includes patient education and counseling. Before surgery, it is important that the woman understand the permanent nature of tubal ligation, and the risks of anesthesia and surgery. Her med-



Tubal ligation is a permanent form of contraception in which a woman's Fallopian tubes are surgically cut, cauterized, tied, or blocked to prevent pregnancy. This procedure blocks the pathway sperm takes to fertilize an egg. (Illustration by Electronic Illustrators Group.)

ical history is reviewed, and a **physical examination** and laboratory testing are performed. The patient is not allowed to eat or drink for several hours before surgery.

Aftercare

After surgery, the patient is monitored for several hours before she is allowed to go home. She is instructed on care of the surgical wound, and what signs to watch for, such as **fever**, nausea, vomiting, faintness, or **pain**. These signs could indicate that complications have occurred.

Risks

While major complications are uncommon after tubal ligation, there are risks with any surgical procedure. Possible side effects include infection and bleeding. Rarely, **death** may occur as a complication of general anesthesia if a major blood vessel is cut. The death rate following tubal ligation is about four per 100,000 sterilizations.

After laparoscopy, the patient may experience pain in the shoulder area from the carbon dioxide used during surgery, but the technique is associated with less pain than

mini-laparotomy, as well as a faster recovery period. Mini-laparotomy results in a higher incidence of pain, bleeding, bladder injury, and infection compared with laparoscopy. Patients normally feel better after three or four days of rest, and are able to resume sexual activity at that time.

Following tubal ligation, there is a low risk (less than 1%) of **ectopic pregnancy**. Ectopic pregnancy is a condition in which the fertilized egg implants in a place other than the uterus, usually in one of the Fallopian tubes. Ectopic pregnancies are more likely to happen in younger women, and in women whose tubes were ligated by electrocoagulation.

Normal results

After having her tubes ligated, a woman does not need to use any form of birth control to avoid pregnancy. Tubal ligation is almost 100% effective for the prevention of conception. The possibility for treatment failure is very low—fewer than one in 200 women (0.4%) will become pregnant during the first year after sterilization. Failure can happen if the cut ends of the tubes grow back together; if the tube was not completely cut or blocked off; if a

KEY TERMS

Contraception—The prevention of the union of the male's sperm with the female's egg.

Ectopic pregnancy—The implantation of a fertilized egg in a Fallopian tube instead of the uterus.

Electrocoagulation—The coagulation or destruction of tissue through the application of a high-frequency electrical current.

Female sterilization—The process of permanently ending a woman's ability to conceive by tying off or cutting apart the Fallopian tubes.

Laparoscopy—Abdominal surgery performed through a laparoscope, which is a thin telescopic instrument inserted through an incision near the navel.

plastic clip or rubber band is loose or comes off; or if the woman was already pregnant at the time of surgery.

Resources

BOOKS

- MacKay, H. Trent. "Gynecology." In *Current Medical Diagnosis and Treatment*, 1996, ed. Stephen J. McPhee, et al. Stamford: Appleton & Lange, 1995.
- Moore, J. George. "Contraception and Sterilization." In *Essentials of Obstetrics and Gynecology*, ed. Neville F. Hacker, et al. Philadelphia: W. B. Saunders Co., 1992.
- Pasquale, Samuel A., and Jennifer Cadoff. *The Birth Control Book: A Complete Guide to Your Contraceptive Options*. New York: Ballantine Books, 1996.

PERIODICALS

- Andolsek, Kathryn M. "Risk of Ectopic Pregnancy Following Tubal Ligation." *American Family Physician* 1 (Oct. 1997): 1460.
- Apgar, Barbara. "Probability of Pregnancy After Tubal Sterilization." *American Family Physician* 15 (Sept. 1996): 1368-1370.
- Haspel-Siegel, Alyssa S. "Fallopian Tube Anastomosis Procedures to Restore Fertility." *AORN Journal* (Jan. 1997): 75-82.
- Hastings, John. "Could I Get Pregnant Even Though I've Had My Tubes Tied?" *Health*, July/Aug. 1996, 30.
- Peterson, Herbert B., et al. "The Risk of Ectopic Pregnancy After Tubal Sterilization." *New England Journal of Medicine* 13 (Mar. 1997): 762-767.
- Segen, Joseph. "Elective Surgery, Selective Coverage." *Business and Health*, 19 Aug. 1997, 48.
- Walling, Anne D. "Tubal Ligation and Long-Term Probability of Hysterectomy." *American Family Physician* 1 (Oct. 1997): 1442-1443.

ORGANIZATIONS

American College of Obstetricians and Gynecologists. 409 12th Street, S.W., P.O. Box 96920

Planned Parenthood Federation of America, Inc. 810 Seventh Ave., New York, NY, 10019. (800) 669-0156. <<http://www.plannedparenthood.org>>.

Mercedes McLaughlin

Tube compression of the esophagus and stomach

Definition

Tube compression of the esophagus and stomach is an emergency procedure used to stop bleeding from the upper digestive tract.

Purpose

Vomiting blood is both frightening and life-threatening. Among its causes are:

- bleeding from the nose and throat
- peptic ulcers
- stomach **cancer**
- esophageal cancer
- a tear in the esophagus caused by violent vomiting (**Mallory-Weiss syndrome**)
- breaking of blood vessels in the esophagus

The most profuse bleeding comes from veins in the lower esophagus, just above the stomach, that have dilated to enormous dimensions as the result of liver disease. When the liver shrinks due to **cirrhosis** (scarring from chronic disease), its blood vessels shrink, forcing blood from the intestines to find alternate routes back to the heart. The blood usually flows through tiny veins in the esophagus located just beneath the passageway where food passes downward and vomitus passes upward. Major causes for this rearrangement are alcoholic liver disease, chronic hepatitis, and cholangitis. Called esophageal varices, the affected veins can be easily damaged and bleed voraciously.

Description

One emergency method of stopping bleeding from esophageal varices is to tamponade it with a balloon. The Sengstaken-Blakemore tube is a complex rubber device with two balloons and three channels—one channel for each balloon and one that goes all the way through. The

KEY TERMS

Cholangitis—Inflammation of the system of tubes that drains bile from the liver into the intestines.

Chronic hepatitis—Long lasting inflammation of the liver due to viruses or other causes.

Peptic ulcers—Wounds in the stomach and duodenum caused by stomach acid and the bacterium *Helicobacter pylori*.

Tamponade—To occlude by pressure.

Risks

Major complications frequently occur, and **death** results about 3% of the time. Problems include damage to the esophagus and stomach and interference with the airway. Should the tube remain in place too long, there is danger of the pressure eroding the esophagus or the nose.

Resources

BOOKS

Henneman, Philip L. "Gastrointestinal bleeding." In *Emergency Medicine*, ed. Peter Rosen, et al. St. Louis: Mosby, 1998.

J. Ricker Polsdorfer, MD

Minnesota tube has four channels, an extra one that opens above the first balloon. The bottom balloon is round; the upper balloon is long and narrow. The tube is passed through the nose or mouth into the stomach, where the bottom balloon is inflated. Then the tube is pulled back until the bottom balloon comes up against the narrow valve at the top of the stomach, when it can go no further. At this point, the upper balloon is inflated, putting pressure on a length of esophagus where the bleeding veins are located. The tube is then fixed so it cannot be dislodged. The third channel in the tube is used to aspirate (suck out) stomach contents to see if the bleeding has stopped. The fourth channel aspirates from the esophagus.

These tubes are a temporary measure. They stabilize the patient until bleeding has stopped, blood transfusions are received, and permanent repair is imminent.

Since the lower balloon effectively separates the esophagus from the stomach, it is possible to determine more accurately where the bleeding is located when it is in place.

This method of treating upper intestinal bleeding is being replaced by procedures that use a gastroscope, a flexible device that permits viewing and operating without surgery.

Preparation

The procedure is explained to the patient and family. A sedative may be given to prepare the patient for the procedure.

Aftercare

With the tube in place, the patient cannot eat and may have some difficulty breathing. The patient will be hospitalized until the tube can be removed.

Tube feedings

Definition

Nutrients, either a special liquid formula or pureed food, are delivered to a patient through a tube directly into the gastrointestinal tract, usually into the stomach or small intestine.

Purpose

Tube feeding provides **nutrition** to patients who are unable or unwilling to eat food. Conditions where tube feeding is considered include **protein-energy malnutrition**, liver or kidney failure, **coma**, or in patients who cannot chew or swallow (dysphagia) due to **stroke**, **brain tumor**, or **head injury**. Patients who are receiving **radiation therapy** or **chemotherapy** treatments for **cancer** may also be candidates for tube feedings.

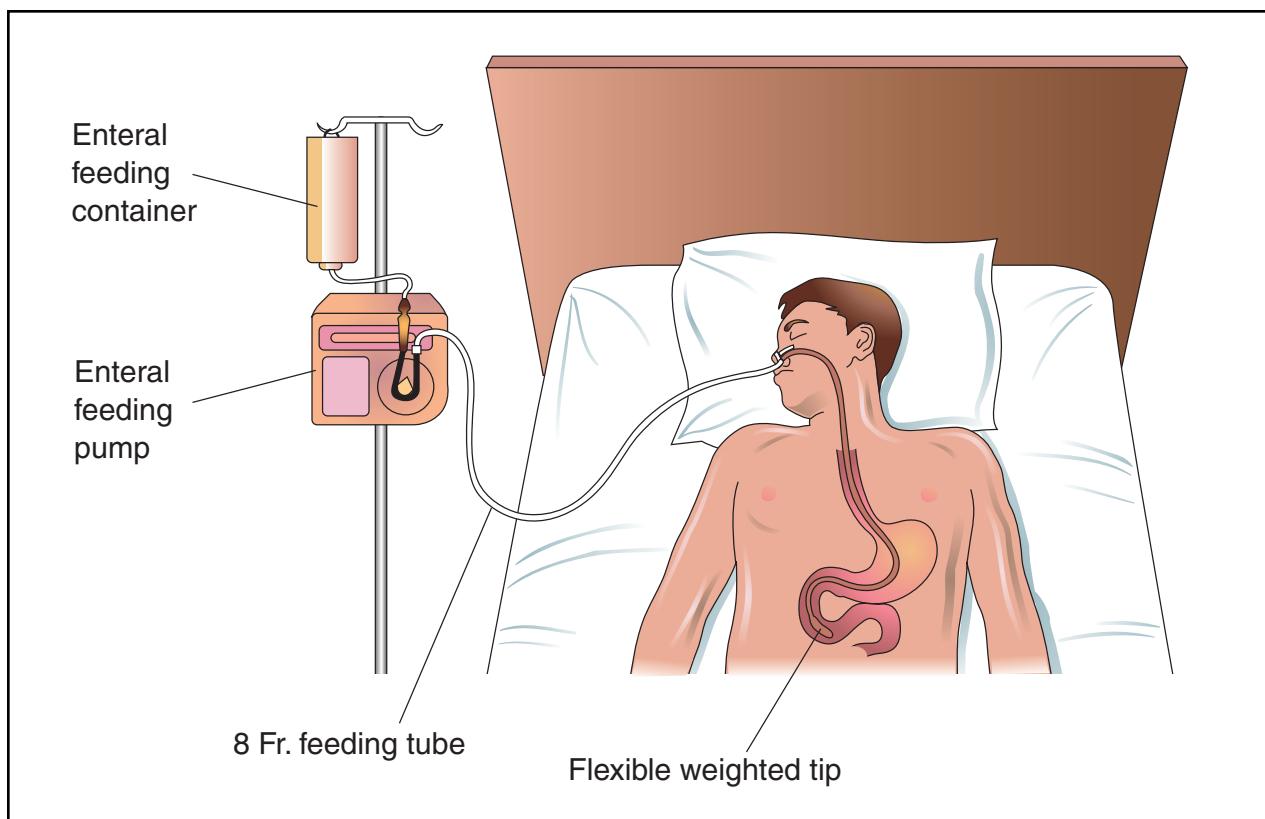
Precautions

Certain medications may interact with some formulas to inactivate the nutrients or change the way that the drug is absorbed.

Description

A flexible, narrow tube is inserted into some portion of the digestive tract and liquid formulas or liquefied foods are placed into the tube to meet the patient's nutritional needs. The feeding may be pumped into the tube or allowed to drip into the tube continuously or at scheduled feeding times.

A feeding tube can be inserted by a surgical or non-surgical procedure in several positions along the gastrointestinal tract. The tube may be inserted into the nose



A feeding tube can be inserted by a surgical or nonsurgical procedure in several positions along the gastrointestinal tract to provide nutrition to patients who are unable or unwilling to eat food. The feeding may be pumped into the tube or allowed to drip into the tube continuously, or at scheduled feeding times. The illustration above features a nasojejunal tube which is inserted through the nose and ends in either the duodenum or jejunum. (Illustration by Electronic Illustrators Group.)

and passed down the throat and through the esophagus. A nasogastric tube is inserted through the nose with the end of the tube reaching into the stomach. A nasoduodenal or nasojejunal tube is inserted through the nose and ends in either the duodenum or jejunum, both of which are portions of the small intestine. This type of tube placement is usually used for short-term feeding. Surgical placement of a feeding tube may be done if there will be a long-term need for feeding that bypasses the upper digestive tract. An esophagostomy creates an opening in the esophagus, a **gastrostomy** creates an opening into the stomach, and a jejunostomy creates an opening into the jejunum. The feeding tube is then inserted through the surgically created opening.

Tube feedings can be a mixture of regular foods that are blended with liquid to make a consistency that will pass through the tube. Nutritionally balanced liquid products are often more convenient to use and ensure a balance of proteins, fats, and carbohydrates along with **vitamins** and **minerals**. Specialized formulas are also available to meet almost any nutritional need. For example, patients with severe **burns**, protein-energy **malnu-**

trition, or slow wound healing may require formulas that are higher in protein. Patients with renal failure may require low-protein formulas with lower concentrations of minerals and vitamins.

Preparation

The reasons that tube feeding is necessary are discussed with the patient, as is the length of time that the feeding tube is expected to be in place. The specific procedure is also explained to the patient.

Aftercare

Patients with **ostomy** feeding tubes may have the tube positioned level with the surrounding skin. A cap or button can be placed over the opening so that it can be more comfortably concealed under clothing. The opening and surrounding tissue need to be cleaned and inspected regularly to prevent infection. For patients with a tube inserted through the nose, daily nasal hygiene is important and the mouth and lips should be kept moist. Good mouth care is necessary for any patient with a feeding tube.

KEY TERMS

Duodenum—The upper portion of the small intestine. It is approximately 10 in (25 cm) long and extends from the stomach to the jejunum.

Jejunum—The middle portion of the small intestine. It is approximately 8 ft (2.5 m) long and extends from the jejunum to the ileum.

Risks

Formula from the tube can backup in the esophagus and be breathed into the trachea and lungs, causing aspiration **pneumonia**. The placement of the tube should be checked frequently and the head of the bed elevated during and after feeding to prevent the solution from moving back up the digestive tract. Feeding tubes can also become clogged and should be flushed regularly with water. If the feeding formula is too concentrated or given too fast, the patient may experience nausea, vomiting, cramping, and bloating. The feeding may need to be diluted with liquid or the rate at which it is given decreased. **Diarrhea** or **constipation** can occur if the feeding is not the right composition or does not provide enough liquid. The tube itself can irritate the nasal passage, esophagus, or surrounding tissues.

Normal results

A patient may be able to return to a normal diet of solid foods after short-term supplementation with formula through a feeding tube. In cases where long-term nutritional therapy is required, all of the patient's nutritional needs will have to be provided by the formula. The balance of fluids, calories, proteins, fats, vitamins, and minerals may need to be adjusted periodically.

Abnormal results

If formula feedings are not tolerated by the patient or are inadequate to meet his or her nutritional needs, the patient may need to receive **nutrition through an intravenous line** (parenteral nutrition). This type of therapy involves delivery of sterile nutrient solutions directly into the bloodstream through a needle inserted into a vein.

Resources

BOOKS

"Enteral Nutrition." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

Howard, Lyn. "Enteral and Parenteral Nutrition Therapy." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Lagua, R. T., and V. S. Claudio. *Nutrition and Diet Therapy Reference Dictionary*. 4th ed. New York: Chapman & Hall, 1996.

Altha Roberts Edgren

Tuberculin skin test

Definition

Tuberculosis (TB) is an airborne infectious disease caused by the bacteria *Mycobacterium tuberculosis*. Besides culturing in the laboratory, the two most common types of tests to screen for exposure to this disease are the Mantoux PPD tuberculin skin test, which is generally considered the most reliable, and the older TB tine test, which is now rarely used. These tests are designed to help identify individuals who may have been infected by the tuberculosis bacteria. A diagnosis of active, infectious tuberculosis is never made solely based on the results of a TB skin test, but requires further testing, including a **sputum culture** and a chest x-ray.

Purpose

Because TB is spread through the air, especially in poorly ventilated areas, it is more commonly found among people living in crowded conditions, such as jails, nursing homes, and homeless shelters. Often, a TB skin test will be given as part of a **physical examination** when a person is hiring a new employee, particularly for those individuals seeking employment in the health-care or food service professions.

People can be exposed to or infected with TB without showing any symptoms or necessarily developing the disease. Individuals with normally functioning immune systems generally prevent the spread of the bacteria by "walling off" or encysting the bacteria within the body. To be at risk for infection a person must have or had close contact with someone who has active tuberculosis (such as a friend or family member). Persons who are more at risk for developing the TB infection overtly include those with a weakened immune system (immunocompromised), either from a chronic disease, such as HIV infection; or as a result of a tissue or organ transplant or other medical treatment designed to suppress the immune system. Symptoms of tuberculosis include a persistent **cough**, **fever**, weight loss, night sweats, **fatigue**, and loss of appetite.

Precautions

Although the test is generally considered safe, it is important to inform the person conducting the test if the patient may be pregnant, have had a positive TB test in the past, or have had tuberculosis in the past. People who have had a positive TB test in the past will probably always have a positive test and should not be tested again.

There are several situations when the TB test results might not be accurate. These include situations involving people who:

- have had vaccinations (such as those for **measles, polio, rubella or mumps**) within the last four weeks
- are taking steroids
- have severe malnutrition

Description

TB skin tests are usually given at a clinic, hospital, or doctor's office. Sometimes the tests are given at schools or workplaces and may be a pre-employment requirement. Many cities provide free TB skin tests and followup care. The Mantoux PPD tuberculin skin test involves injecting a very small amount of a substance called PPD tuberculin just under the top layer of the skin (intracutaneously). Tuberculin is a mixture of antigens obtained from the culture of *M. tuberculosis*. Antigens are foreign particles or proteins that stimulate the immune system to produce antibodies. Two different tuberculin preparations are available, Old Tuberculin (OT) and Purified Protein Derivative (PPD). The latter is the preferred testing substance. The test is usually given on the inside of the forearm about halfway between the wrist and the elbow, where a small bubble will form as the tuberculin is injected. The skin test takes just a minute to administer.

After 48–72 hours, the test site will be examined by a trained person for evidence of swelling. People who have been exposed to tuberculosis will develop an immune response, causing a slight swelling at the injection site. If there is a lump or swelling, the health care provider will use a ruler to measure the size of the reaction.

The other method of TB skin test is called the multiple puncture test or tine test because the small test instrument has several small tines that lightly prick the skin. The small points of the instrument are either coated with dried tuberculin or are used to puncture through a film of liquid tuberculin. The test is read by measuring the size of the largest papule. Because it is not possible to precisely control the amount of tuberculin used in the tine test, a positive test should be verified using the Mantoux

test. For this reason, the tine test is not as widely used as the Mantoux test and is considered to be less reliable.

Preparation

There is no special preparation needed before a TB skin test. A brief personal history will be taken to determine whether the person has had tuberculosis or a TB test before, has been in close contact with anyone with TB, or has any significant risk factors. Directly before the test, the skin on the arm at the injection site is usually cleaned with an alcohol swab and allowed to air dry.

Aftercare

After having a TB skin test, it is extremely important to make sure that the patient keeps the appointment to have the test reaction read. The patient is instructed to keep the test site clean, uncovered, and to not scratch or rub the area. Should severe swelling, **itching**, or **pain** occur, or if the patient has trouble breathing, the clinic or health care provider should be contacted immediately.

Risks

The risk of an adverse reaction is very low. Occasionally, an individual who has been exposed to the TB bacteria will develop a large reaction in which the arm swells and is uncomfortable. This reaction should disappear in two weeks. A sore might develop where the injection was given, or a fever could occur, but these are extremely rare reactions.

It is possible that a person who has TB may receive a negative test result (called a "false negative") or a person who does not have TB may receive a positive test result (called a "false positive"). If there is some doubt, the test may be repeated or the person may be given a diagnostic test using a **chest x ray** and/or sputum sample culture test to determine whether the disease is present and/or active in the lungs.

Normal results

In people who have not been exposed to TB, there will be little or no swelling at the test site after 48–72 hours. This is a negative test. Negative tests can be interpreted to mean that the person has not been infected with the tuberculosis bacteria or that the person has been infected recently and not enough time has elapsed for the body to react to the skin test. Persons become sensitive between two and ten weeks after the initial infection. As a result, if the person has been in contact with someone with tuberculosis, the test should be repeated in three months. Also, because it may take longer than 72 hours

for an elderly individual to develop a reaction, it may be useful to repeat the TB skin test after one week to adequately screen these individuals. Immunocompromised persons may be unable to react sufficiently to the Mantoux test, and either a chest x ray or sputum sample may be required.

Abnormal results

A reaction of 5 mm of induration (swelling) is considered positive for the following groups:

- household contacts of persons with active tuberculosis
- AIDS patients
- persons with old healed tuberculosis on chest x ray
- organ transplant recipients
- persons receiving immunosuppressive medications

A reaction of 10 mm of induration is considered positive in individuals with one or more of the following risk factors which are either reasons to have a higher exposure to TB and/or a condition that increases the risk for progression to active TB:

- foreign-born immigrants from Asia, Africa, or Latin America
- injection drug users
- residents and employees of such high-risk congregate settings as hospitals and jails
- medically underserved low-income populations
- TB lab personnel
- children younger than four years of age or infants, children or adolescents exposed to adults in high risk categories
- residents of long-term care facilities
- individuals with certain medical conditions that increase the risk of developing tuberculosis; these medical conditions include being 10% or more below ideal body weight, **silicosis**, chronic renal failure, **diabetes mellitus**, high dose corticosteroid or other immunosuppressive therapy, some blood disorders like leukemia and lymphomas, and other cancer

Finally, a reaction of 15 mm of induration or greater is considered positive in those with no risk factors and are therefore at the lowest risk of developing TB.

A TB skin conversion is defined as an increase of 10 mm or greater of induration within a two year period, regardless of age.

A positive reaction to tuberculin may be the result of a previous natural infection with *M. tuberculosis*, infection with a variety of non-tuberculosis mycobacteria

(cross-reaction), or tuberculosis **vaccination** with a live, but weakened (attenuated) mycobacterial strain. TB vaccination is not done in the US. Cross-reactions are positive reactions that occur as a result of a person's exposure to other non-tuberculosis bacteria. These tend to be smaller than those caused by *M. tuberculosis*. There is no reliable way of distinguishing whether a positive TB skin test is due to a previous vaccination against tuberculosis. Generally, however, positive results are not due to vaccination exposure because reactions in vaccinated people tend to be less than 10 mm, and an individual's sensitivity to tuberculin steadily declines after vaccination. If the skin test is interpreted as positive, a chest x ray will be performed to determine whether the person has active tuberculosis or whether the body has sufficiently handled the infection.

Resources

BOOKS

Faculty Members at the Yale University School of Medicine.

“Tuberculin Skin Testing.” In *The Patient’s Guide to Medical Tests*, edited by Barry L. Zaret. New York, NY: Houghton Mifflin Company, 1997.

The Merck Manual of Diagnosis and Therapy. Edited by Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

“Tuberculosis.” In *Diseases*, edited by Bryan Bunch. Danbury, CT: Scientific Publishing, Inc., 1997.

PERIODICALS

Advisory Council for the Elimination of Tuberculosis.

“Screening for Tuberculosis and Tuberculosis Infection in High Risk Populations.” *Morbidity & Mortality Weekly Report* 44 (September 8, 1995):19-34.

Pouchot, J., et al. “Reliability of Tuberculin Skin Test Measurement.” *Annals of Internal Medicine* 126 (February 1, 1997): 210-214.

Rose, D. N., et al. “Interpretation of the Tuberculin Skin Test.” *Journal of General Internal Medicine* 10 (November 1995): 635-642.

Steele, Russell W. “Tuberculosis in Children: A Growing Concern.” *Infectious Medicine* 12, no. 9, (1995): 442, 453.

Centers for Disease Control, “Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection.” *Morbidity and Mortality Weekly Report* 49 (RR-6)(2000): 3-4

ORGANIZATION

American Lung Association. 800-LUNG-USA.

National Tuberculosis Center. University of Medicine and Dentistry of New Jersey. Executive Office, Suite GB1, 65 Bergen Street, Newark, NJ 07107-3268. (800) 4TB-DOCS. <<http://www.umdnj.edu/~ntbcweb/ntbchome.htm>>.

OTHER

American Family Physician. “Positive Skin Tests for Tuberculosis.” <<http://www.aafp.org/healthinfo>>.

KEY TERMS

Antibody—A specific protein produced by the immune system in response to a specific foreign protein or particle called an antigen.

Antigen—Any foreign particle or protein that causes an immune response.

Attenuated—A live but weakened microorganism that can no longer produce disease.

Cross-reaction—Positive reactions that occur as a result of a person's exposure to other non-tuberculosis bacteria.

Immunocompromised—A state in which the immune system is suppressed or not functioning properly.

Intracutaneous—Into the skin, in this case directly under the top layer of skin.

Mantoux or PPD test—Other names for a tuberculin skin test. PPD stands for purified protein derivative.

Tuberculin—A mixture of antigens obtained from the cultured bacteria that cause tuberculosis, *Mycobacterium tuberculosis*.

Description

Overview

Tuberculosis was popularly known as consumption for a long time. Scientists know it as an infection caused by *M. tuberculosis*. In 1882, the microbiologist Robert Koch discovered the tubercle bacillus, at a time when one of every seven deaths in Europe was caused by TB. Because antibiotics were unknown, the only means of controlling the spread of infection was to isolate patients in private sanatoria or hospitals limited to patients with TB—a practice that continues to this day in many countries. The net effect of this pattern of treatment was to separate the study of tuberculosis from mainstream medicine. Entire organizations were set up to study not only the disease as it affected individual patients, but its impact on the society as a whole. At the turn of the twentieth century more than 80% of the population in the United States were infected before age 20, and tuberculosis was the single most common cause of death. By 1938 there were more than 700 TB hospitals in this country.

Tuberculosis spread much more widely in Europe when the industrial revolution began in the late nineteenth century. The disease became widespread somewhat later in the United States, because the movement of the population to large cities made overcrowded housing so common. When streptomycin, the first antibiotic effective against *M. tuberculosis*, was discovered in the early 1940s, the infection began to come under control. Although other more effective anti-tuberculosis drugs were developed in the following decades, the number of cases of TB in the United States began to rise again in the mid-1980s. This upsurge was in part again a result of overcrowding and unsanitary conditions in the poor areas of large cities, prisons, and homeless shelters. Infected visitors and immigrants to the United States also contributed to the resurgence of TB. An additional factor is the AIDS epidemic. AIDS patients are much more likely to develop tuberculosis because of their weakened immune systems. There still are an estimated 8 to 10 million new cases of TB each year worldwide, causing roughly 3 million deaths.

Suzanne M. Lutwick, MPH

Tuberculosis

Definition

Tuberculosis (TB) is a potentially fatal contagious disease that can affect almost any part of the body but is mainly an infection of the lungs. It is caused by a bacterial microorganism, the tubercle bacillus or *Mycobacterium tuberculosis*. Although TB can be treated, cured, and can be prevented if persons at risk take certain drugs, scientists have never come close to wiping it out. Few diseases have caused so much distressing illness for centuries and claimed so many lives.

High-risk populations

THE ELDERLY. Tuberculosis is more common in elderly persons. More than one-fourth of the nearly 23,000 cases of TB reported in the United States in 1995 developed in people above age 65. Many elderly patients developed the infection some years ago when the disease was more widespread. There are additional reasons for the vulnerability of older people: those living in nursing homes and similar facilities are in close contact with others who may be infected. The aging process itself may

weaken the body's immune system, which is then less able to ward off the tubercle bacillus. Finally, bacteria that have lain dormant for some time in elderly persons may be reactivated and cause illness.

RACIAL AND ETHNIC GROUPS. TB also is more common in blacks, who are more likely to live under conditions that promote infection. As the end of the century approaches, two-thirds of all cases of TB in the United States affect African Americans, Hispanics, Asians, and persons from the Pacific Islands. Another one-fourth of cases affect persons born outside the United States. As of 1992, the risk of TB was still increasing in all these groups.

LIFESTYLE FACTORS. The high risk of TB in AIDS patients extends to those infected by human **immunodeficiency** virus (HIV) who have not yet developed clinical signs of AIDS. Alcoholics and intravenous drug abusers are also at increased risk of contracting tuberculosis. Until the economic and social factors that influence the spread of tubercular infection are remedied, there is no real possibility of completely eliminating the disease.

Causes and symptoms

Transmission

Tuberculosis spreads by droplet infection. This type of transmission means that when a TB patient exhales, coughs, or sneezes, tiny droplets of fluid containing tubercle bacilli are released into the air. This mist, or aerosol as it is often called, can be taken into the nasal passages and lungs of a susceptible person nearby. Tuberculosis is not, however, highly contagious compared to some other infectious diseases. Only about one in three close contacts of a TB patient, and fewer than 15% of more remote contacts, are likely to become infected. As a rule, close, frequent, or prolonged contact is needed to spread the disease. Of course, if a severely infected patient emits huge numbers of bacilli, the chance of transmitting infection is much greater. Unlike many other infections, TB is not passed on by contact with a patient's clothing, bed linens, or dishes and cooking utensils. The most important exception is **pregnancy**. The fetus of an infected mother may contract TB by inhaling or swallowing the bacilli in the amniotic fluid.

Progression

Once inhaled, tubercle bacilli may reach the small breathing sacs in the lungs (the alveoli), where they are taken up by cells called macrophages. The bacilli multiply within these cells and then spread through the lymph vessels to nearby lymph nodes. Sometimes the bacilli move through blood vessels to distant organs. At this

point they may either remain alive but inactive (quiescent), or they may cause active disease. Actual tissue damage is not caused directly by the tubercle bacillus, but by the reaction of the person's tissues to its presence. In a matter of weeks the host develops an immune response to the bacillus. Cells attack the bacilli, permit the initial damage to heal, and prevent future disease permanently.

Infection does not always mean disease; in fact, it usually does not. At least nine of ten patients who harbor *M. tuberculosis* do not develop symptoms or physical evidence of active disease, and their x-rays remain negative. They are not contagious; however, they do form a pool of infected patients who may get sick at a later date and then pass on TB to others. It is thought that more than 90% of cases of active tuberculosis come from this pool. In the United States this group numbers 10 to 15 million persons. Whether or not a particular infected person will become ill is impossible to predict with certainty. An estimated 5% of infected persons get sick within 12–24 months of being infected. Another 5% heal initially but, after years or decades, develop active tuberculosis either in the lungs or elsewhere in the body. This form of the disease is called reactivation TB, or post-primary disease. On rare occasions a previously infected person gets sick again after a later exposure to the tubercle bacillus.

Pulmonary tuberculosis

Pulmonary tuberculosis is TB that affects the lungs. Its initial symptoms are easily confused with those of other diseases. An infected person may at first feel vaguely unwell or develop a **cough** blamed on **smoking** or a cold. A small amount of greenish or yellow sputum may be coughed up when the person gets up in the morning. In time, more sputum is produced that is streaked with blood. Persons with pulmonary TB do not run a high **fever**, but they often have a low-grade one. They may wake up in the night drenched with cold sweat when the fever breaks. The patient often loses interest in food and may lose weight. Chest **pain** is sometimes present. If the infection allows air to escape from the lungs into the chest cavity (**pneumothorax**) or if fluid collects in the pleural space (**pleural effusion**), the patient may have difficulty breathing. If a young adult develops a pleural effusion, the chance of tubercular infection being the cause is very high. The TB bacilli may travel from the lungs to lymph nodes in the sides and back of the neck. Infection in these areas can break through the skin and discharge pus. Before the development of effective antibiotics, many patients became chronically ill with increasingly severe lung symptoms. They lost a great deal of weight and developed a wasted appearance. This outcome is uncommon today—at least where modern treatment methods are available.

Extrapulmonary tuberculosis

Although the lungs are the major site of damage caused by tuberculosis, many other organs and tissues in the body may be affected. The usual progression is for the disease to spread from the lungs to locations outside the lungs (extrapulmonary sites). In some cases, however, the first sign of disease appears outside the lungs. The many tissues or organs that tuberculosis may affect include:

- **Bones.** TB is particularly likely to attack the spine and the ends of the long bones. Children are especially prone to spinal tuberculosis. If not treated, the spinal segments (vertebrae) may collapse and cause **paralysis** in one or both legs.
- **Kidneys.** Along with the bones, the kidneys are probably the commonest site of extrapulmonary TB. There may, however, be few symptoms even though part of a kidney is destroyed. TB may spread to the bladder. In men, it may spread to the prostate gland and nearby structures.
- **Female reproductive organs.** The ovaries in women may be infected; TB can spread from them to the peritoneum, which is the membrane lining the abdominal cavity.
- **Abdominal cavity.** Tuberculous **peritonitis** may cause pain ranging from the vague discomfort of stomach cramps to intense pain that may mimic the symptoms of appendicitis.
- **Joints.** Tubercular infection of joints causes a form of arthritis that most often affects the hips and knees. The wrist, hand, and elbow joints also may become painful and inflamed.
- **Meninges.** The meninges are tissues that cover the brain and the spinal cord. Infection of the meninges by the TB bacillus causes tuberculous **meningitis**, a condition that is most common in young children but is especially dangerous in the elderly. Patients develop headaches, become drowsy, and eventually comatose. Permanent brain damage is the rule unless prompt treatment is given. Some patients with tuberculous meningitis develop a tumor-like brain mass called a tuberculoma that can cause stroke-like symptoms.
- **Skin, intestines, adrenal glands, and blood vessels.** All these parts of the body can be infected by *M. tuberculosis*. Infection of the wall of the body's main artery (the aorta), can cause it to rupture with catastrophic results. Tuberculous **pericarditis** occurs when the membrane surrounding the heart (the pericardium) is infected and fills up with fluid that interferes with the heart's ability to pump blood.
- **Miliary tuberculosis.** Miliary TB is a life-threatening condition that occurs when large numbers of tubercle

bacilli spread throughout the body. Huge numbers of tiny tubercular lesions develop that cause marked weakness and weight loss, severe anemia, and gradual wasting of the body.

Diseases similar to tuberculosis

There are many forms of mycobacteria other than *M. tuberculosis*, the tubercle bacillus. Some cause infections that may closely resemble tuberculosis, but they usually do so only when an infected person's immune system is defective. People who are HIV-positive are a prime example. The most common mycobacteria that infect AIDS patients are a group known as *Mycobacterium avium* complex (MAC). People infected by MAC are not contagious, but they may develop a serious lung infection that is highly resistant to antibiotics. MAC infections typically start with the patient coughing up mucus. The infection progresses slowly, but eventually blood is brought up and the patient has trouble breathing. In AIDS patients, MAC disease can spread throughout the body, with anemia, **diarrhea**, and stomach pain as common features. Often these patients die unless their immune system can be strengthened. Other mycobacteria grow in swimming pools and may cause skin infection. Some of them infect **wounds** and artificial body parts such as a breast implant or mechanical heart valve.

Diagnosis

The diagnosis of TB is made on the basis of laboratory test results. The standard test for tuberculosis—which is the so-called tuberculin skin test—detects the presence of infection, not of active TB. Tuberculin is an extract prepared from cultures of *M. tuberculosis*. It contains substances belonging to the bacillus (antigens) to which an infected person has been sensitized. When tuberculin is injected into the skin of an infected person, the area around the injection becomes hard, swollen, and red within one to three days. Today skin tests utilize a substance called purified protein derivative (PPD) that has a standard chemical composition and is therefore is a good measure of the presence of tubercular infection. The PPD test is also called the Mantoux test. The Mantoux PPD skin test is not, however, 100% accurate; it can produce false positive as well as false negative results. What these terms mean is that some people who have a skin reaction are not infected (false positive) and that some who do not react are in fact infected (false negative). The PPD test is, however, useful as a screener. Anyone who has suspicious findings on a **chest x ray**, or any condition that makes TB more likely should have a PPD test. In addition, those in close contact with a TB patient and persons who come from a country where TB is common also should be test-



(Library of Congress.)

Florence Barbara Seibert was born on October 6, 1897, in Easton, Pennsylvania, the second of three children. She was the daughter of George Peter Seibert, a rug manufacturer and merchant, and Barbara (Memmert) Seibert. At the age of three she contracted polio. Despite her resultant handicaps, she completed high school, with the

help of her highly supportive parents, and entered Goucher College in Baltimore, where she studied chemistry and zoology. She graduated in 1918, then worked under the direction of one of her chemistry teachers, Jessie E. Minor, at the Chemistry Laboratory of the Hammersley Paper Mill in Garfield, New Jersey. She and her professor, having responded to the call for women to fill positions vacated by men fighting in World War I, coauthored scientific papers on the chemistry of cellulose and wood pulps.

A biochemist who received her Ph.D. from Yale University in 1923, Florence B. Seibert is best known for her research in the biochemistry of tuberculosis. She developed the protein substance used for the tuberculosis skin test. The substance was adopted as the standard in 1941 by the United States and a year later by the World Health Organization. In addition, in the early 1920s, Seibert discovered that the sudden fevers that sometimes occurred during intravenous injections were caused by bacteria in the distilled water that was used to make the protein solutions. She invented a distillation apparatus that prevented contamination. This research had great practical significance later when intravenous blood transfusions became widely used in surgery. Seibert authored or coauthored more than a hundred scientific papers. Her later research involved the study of bacteria associated with certain cancers. Her many honors include five honorary degrees, induction into the National Women's Hall of Fame in Seneca Falls, New York (1990), the Garvan Gold Medal of the American Chemical Society (1942), and the John Elliot Memorial Award of the American Association of Blood Banks (1962).

ed, as should all healthcare personnel and those living in crowded conditions or institutions.

Because the symptoms of TB cover a wide range of severity and affected body parts, diagnosis on the basis of external symptoms is not always possible. Often, the first indication of TB is an abnormal chest x-ray or other test result rather than physical discomfort. On a chest x-ray, evidence of the disease appears as numerous white, irregular areas against a dark background, or as enlarged lymph nodes. The upper parts of the lungs are most often affected. A PPD test is always done to show whether the patient has been infected by the tubercle bacillus. To verify the test results, the physician obtains a sample of sputum or a tissue sample (biopsy) for culture. Three to five sputum samples should be taken early in the morning. If necessary, sputum for culture can be produced by spraying salt solution into the windpipe. Culturing *M. tuberculosis* is useful for diagnosis because the bacillus has certain distinctive characteristics. Unlike many other types

of bacteria, mycobacteria can retain certain dyes even when exposed to acid. This so-called acid-fast property is characteristic of the tubercle bacillus.

Body fluids other than sputum can be used for culture. If TB has invaded the brain or spinal cord, culturing a sample of spinal fluid will make the diagnosis. If TB of the kidneys is suspected because of pus or blood in the urine, culture of the urine may reveal tubercular infection. Infection of the ovaries in women can be detected by placing a tube having a light on its end (a laparoscope) into the area. Samples also may be taken from the liver or bone marrow to detect the tubercle bacillus.

Treatment

Supportive care

In the past, treatment of TB was primarily supportive. Patients were kept in **isolation**, encouraged to rest, and fed well. If these measures failed the lung was col-

KEY TERMS

Bacillus Calmette-Guérin (BCG)—A vaccine made from a damaged bacillus akin to the tubercle bacillus, which may help prevent serious pulmonary TB and its complications.

Mantoux test—Another name for the PPD test.

Miliary tuberculosis—The form of TB in which the bacillus spreads through all body tissues and organs, producing many thousands of tiny tubercular lesions. Miliary TB is often fatal unless promptly treated.

Mycobacteria—A group of bacteria that includes *Mycobacterium tuberculosis*, the bacterium that causes tuberculosis, and other forms that cause related illnesses.

Pneumothorax—Air inside the chest cavity, which may cause the lung to collapse. Pneumothorax is both a complication of pulmonary tuberculosis and

a means of treatment designed to allow an infected lung to rest and heal.

Pulmonary—Refers to the lungs.

Purified protein derivative (PPD)—An extract of tubercle bacilli that is injected into the skin to find out whether a person presently has or has ever had tuberculosis.

Resistance—A property of some bacteria that have been exposed to a particular antibiotic and have “learned” how to survive in its presence.

Sputum—Secretions produced in the infected lung and coughed up. A sign of illness, sputum is routinely used as a specimen for culturing the tubercle bacillus in the laboratory.

Tuberculoma—A tumor-like mass in the brain that sometimes develops as a complication of tuberculous meningitis.

lapsed surgically so that it could “rest” and heal. Today surgical procedures still are used when necessary, but contemporary medicine relies on drug therapy as the mainstay of home care. Given an effective combination of drugs, patients with TB can be treated at home as well as in a sanitorium. Treatment at home does not pose the risk of infecting other household members.

Drug therapy

Most patients with TB can recover if given appropriate medication for a sufficient length of time. Three principles govern modern drug treatment of TB:

- Lowering the number of bacilli as quickly as possible. This measure minimizes the risk of transmitting the disease. When sputum cultures become negative, this has been achieved. Conversely, if the sputum remains positive after five to six months, treatment has failed.
- Preventing the development of drug resistance. For this reason, at least two different drugs and sometimes three are always given at first. If drug resistance is suspected, at least two different drugs should be tried.
- Long-term treatment to prevent relapse.

Five drugs are most commonly used today to treat tuberculosis: isoniazid (INH, Laniazid, Nydrazid); rifampin (Rifadin, Rimactane); pyrazinamide (Tebrazid); streptomycin; and ethambutol (Myambutol). The first three drugs may be given in the same capsule to mini-

mize the number of pills in the dosage. As of 1998, many patients are given INH and rifampin together for six months, with pyrazinamide added for the first two months. Hospitalization is rarely necessary because many patients are no longer infectious after about two weeks of combination treatment. Follow-up involves monitoring of side effects and monthly sputum tests. Of the five medications, INH is the most frequently used drug for both treatment and prevention.

Surgery

Surgical treatment of TB may be used if medications are ineffective. There are three surgical treatments for pulmonary TB: pneumothorax, in which air is introduced into the chest to collapse the lung; thoracoplasty, in which one or more ribs are removed; and removal of a diseased lung, in whole or in part. It is possible for patients to survive with one healthy lung. Spinal TB may result in a severe deformity that can be corrected surgically.

Prognosis

The prognosis for recovery from TB is good for most patients, if the disease is diagnosed early and given prompt treatment with appropriate medications on a long-term regimen. Modern surgical methods have a good outcome in most cases in which they are needed. Miliary tuberculosis is still fatal in many cases but is rarely seen today in developed countries. Even in cases

in which the bacillus proves resistant to all of the commonly used medications for TB, other seldom-used drugs may be tried because the tubercle bacilli have not yet developed resistance to them.

Prevention

General measures

General measures such as avoidance of overcrowded and unsanitary conditions are also necessary aspects of prevention. Hospital emergency rooms and similar locations can be treated with ultraviolet light, which has an antibacterial effect.

Vaccination

Vaccination is one major preventive measure against TB. A vaccine called BCG (Bacillus Calmette-Guérin, named after its French developers) is made from a weakened mycobacterium that infects cattle. Vaccination with BCG does not prevent infection by *M. tuberculosis* but it does strengthen the immune system of first-time TB patients. As a result, serious complications are less likely to develop. BCG is used more widely in developing countries than in the United States. The effectiveness of vaccination is still being studied; it is not clear whether the vaccine's effectiveness depends on the population in which it is used or on variations in its formulation.

Prophylactic use of isoniazid

INH can be given for the prevention as well as the treatment of TB. INH is effective when given daily over a period of 6 to 12 months to people in high-risk categories. INH appears to be most beneficial to persons under the age of 25. Because INH carries the risk of side-effects (liver inflammation, nerve damage, changes in mood and behavior), it is important to give it only to persons at special risk.

High-risk groups for whom isoniazid prevention may be justified include:

- close contacts of TB patients, including health care workers
- newly infected patients whose skin test has turned positive in the past two years
- anyone who is HIV-positive with a positive PPD skin test; isoniazid may be given even if the PPD results are negative if there is a risk of exposure to active tuberculosis
- intravenous drug users, even if they are negative for HIV
- persons with positive PPD results and evidence of old disease on the chest x-ray who have never been treated for TB

- patients who have an illness or are taking a drug that can suppress the immune system
- persons with positive PPD results who have had intestinal surgery; have diabetes or **chronic kidney failure**; have any type of **cancer**; or are more than 10% below their ideal body weight
- people from countries with high rates of TB who have positive PPD results
- people from low-income groups with positive skin test results
- persons with a positive PPD reaction who belong to high-risk ethnic groups (African Americans, Hispanics, Native Americans, Asians, and Pacific Islanders)

Resources

BOOKS

Merck Manual of Medical Information: Home Edition. Ed. Robert Berkow, et al. Whitehouse Station, NJ: Merck Research Laboratories, 1997.

Smolley, Lawrence A., and Debra F. Bryse. *Breathe Right Now: A Comprehensive Guide to Understanding and Treating the Most Common Breathing Disorders*. New York, NY: W. W. Norton & Co., 1998.

ORGANIZATIONS

American Lung Association. 1740 Broadway, New York, NY 10019. (800) 586-4872. <<http://www.lungusa.org>>.

OTHER

New York State Department of Health. "Communicable Disease Fact Sheet."

"Pulmonary Medicine." *Healthweb Page*. 12 Jan. 1998 <<http://healthweb.org/browse.cfm?subjectid=81>>.

David A. Cramer, MD

Tubo-ovarian abscesses see **Pelvic inflammatory disease**

Tularemia

Definition

Tularemia is an illness caused by a bacterium. It results in **fever**, rash, and greatly enlarged lymph nodes.

Description

Tularemia infects a variety of wild animals, including rabbits, deer, squirrels, muskrat, and beaver. Humans can acquire the bacterium directly from contact with the blood or body fluids of these animals, from the bite of a

tick or fly which has previously fed on the blood of an infected animal, or from contaminated food or water.

Tularemia occurs most often in the summer months. It is most likely to infect people who come into contact with infected animals, including hunters, furriers, butchers, laboratory workers, game wardens, and veterinarians. In the United States, the vast majority of cases of tularemia occur in the southeastern and Rocky Mountain states.

Causes and symptoms

Five types of illness may occur, depending on where/how the bacteria enter the body:

- Ulceroglandular/glandular tularemia. Seventy-five to 85% of all cases are of this type. This type is contracted through the bite of an infected tick that has defecated bacteria-laden feces in the area of the bite wound. A tender red bump appears in the area of the original wound. Over a few weeks, the bump develops a punched-out center (ulcer). Nearby lymph nodes grow hugely swollen and very tender. The lymph nodes may drain a thick, pus-like material. Other symptoms include fever, chills, and weakness. In adults, the lymph nodes in the groin are most commonly affected; in children, the lymph nodes in the neck.
- Oculoglandular tularemia. This type accounts for only about 1% of all cases of tularemia. It occurs when a person's contaminated hand rubs his or her eye. The lining of the eyelids and the surface of the white of the eye (conjunctiva) becomes red and severely painful, with multiple small yellow bumps and pitted sores (ulcers). Lymph nodes around the ears, under the jaw, or in the neck may swell and become painful.
- Oropharyngeal and gastrointestinal tularemia. This type occurs when contaminated meat is undercooked and then eaten, or when water from a contaminated source is drunk. Poor hygiene after skinning and cleaning an animal obtained through hunting can also lead to the bacteria entering through the mouth. Sores in the mouth and throat, as well as abdominal **pain, nausea and vomiting**, ulcers in the intestine, intestinal bleeding, and **diarrhea** may all occur.
- Pulmonary tularemia. This rare type of tularemia occurs when a person inhales a spray of infected fluid, or when the bacteria reach the lungs through the blood circulation. A severe **pneumonia** follows.
- Typhoidal tularemia. This type of tularemia is particularly hard to diagnose, because it occurs without the usual skin manifestations or swelling of lymph glands. Symptoms include continuously high fever, terrible **headache**, and confusion. The illness may result in a severely low blood pressure, with signs of poor blood flow to the major organs (shock).

KEY TERMS

Conjunctiva—The lining of the eyelids and the surface of the white part of the eye.

Shock—A state in which drastically low blood pressure prevents adequate blood flow to the tissues and organs throughout the body.

Diagnosis

Samples from the **skin lesions** can be prepared with special stains, to allow identification of the causative bacteria under the microscope. Other tests are available to demonstrate the presence of antibodies (special immune cells that the body produces in response to the presence of specific foreign invaders) which would be increasing over time in an infection with tularemia.

Treatment

Streptomycin (given as a shot in a muscle) and gentamicin (given as either a shot in a muscle or through a needle in the vein) are both used to treat tularemia. Other types of **antibiotics** have been tested, but have often resulted in relatively high rates of relapse (20%).

Prognosis

With treatment, **death** rates from tularemia are under 1%. Without treatment, however, the death rate may reach 30%. The pneumonia and typhoidal types have the worst prognosis without treatment.

Prevention

Prevention involves avoiding areas known to harbor ticks and flies, or the appropriate use of insect repellents. Hunters should wear gloves when skinning animals or preparing meat. Others (butchers, game wardens, veterinarians) who work with animals or carcasses should always wear gloves. A vaccine exists, but is usually only given to people at very high risk due to their profession or hobby (veterinarians, laboratory workers, butchers, hunters, game wardens).

Resources

BOOKS

Jacobs, Richard F. "Tularemia." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

"Some Bacteria Causing Zoonotic Diseases." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*.

3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

PERIODICALS

- Fredericks, David N., and Jack S. Remington. "Tularemia Presenting as Community-Acquired Pneumonia." *Archives of Internal Medicine* 56, no. 18 (14 Oct. 1996): 2137+.
- Schofield, Hal. "Infectious Disease: Leporidae's Revenge." *Patient Care* 30, no. 14 (15 Sept. 1996): 171+.

ORGANIZATIONS

- Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Tumor markers

Definition

Tumor markers are substances, such as proteins, biochemicals, or enzymes, produced by tumor cells or by the body in response to tumor cells. As tumor cells multiply, **cancer** spreads, and tissue is damaged, these substances increase and leak into the bloodstream. Tumor marker levels in blood help physicians evaluate people for certain types of cancer.

Purpose

Tumor marker levels provide evidence about the likelihood of undiagnosed cancer or the status of treated cancer without the expense and discomfort of ultrasound, x-ray, or biopsy procedures. Tumor marker levels are used to screen for and diagnose cancer, predict a person's prognosis, monitor treatment, and watch for cancer recurrence.

Description

Tumor markers associated with common cancers include: AFP, Beta-HCG, CA 15-3, CA 19-9, CA 27.29, CA 125, CEA, and PSA. Some tumor markers are associated with many types of cancer; others, with as few as one. Some tumor markers are always elevated in specific cancers; others are less predictable.

A tumor marker test's ability to screen for and diagnose a specific type of cancer depends on its sensitivity and specificity. A test that is 100% sensitive has no false negatives. It is positive or increased in every person who has that type of cancer. A test that is 100% specific has no false positives. It is negative or decreased in every person who does not have that type of cancer.

Most tumor markers are neither sensitive nor specific enough to screen for or diagnose cancer without the

support of other clinical findings. Increased levels are not found in all people with a specific type of cancer, yet may be found in some people without that type of cancer. In addition, tumor marker levels often do not increase until the person experiences symptoms.

Once cancer is diagnosed, tumor marker levels help determine the amount of cancer present. Higher levels usually indicate more advanced cancer and a worse prognosis. The person and his or her physician use this information to choose between more or less aggressive treatments.

Monitoring cancer treatment is the most common use of tumor markers. As cancer is reduced, levels decrease. Stable or increasing levels indicate the cancer is not responding to treatment.

The choice of tumor marker to use for monitoring is important. Only a marker elevated before treatment can be used to monitor a person during or after treatment. Timing of the tests is also important. Each tumor marker has a unique lifespan in the blood. To monitor a treatment's success, enough time must have passed for the initial marker to be cleared from the blood. Tests done too soon may be falsely elevated because the marker produced by the untreated cancer is still present.

Watching for cancer recurrence is another common reason for tumor marker testing. Periodic testing can detect a recurrence often months earlier than could an ultrasound, x-ray, or **physical examination**.

Tumor marker tests usually are done by combining a sample of blood with a substance containing antibodies to the tumor markers. These antibodies bind to the markers. Another substance is added, often a radioactive substance, to measure the amount of bound marker and antibodies. From this measurement, the amount of tumor marker is calculated.

Conclusions based on tumor marker tests are seldom based on one test result but on a series of test results, called serial measurements. A series of increasing or decreasing values is more significant than a single value.

Tumor marker testing is currently the object of much research. Their use is directed by approval from the Food and Drug Administration (FDA) and guidelines established by organizations such as the American Society of Clinical Oncology and the American Cancer Society.

Tumor marker test results are available within several days. Insurance coverage for markers still in the research stage for particular uses may vary with the company and individual policy.

Alpha-fetoprotein (AFP)

AFP is a protein normally made by only fetal tissue. When certain types of cells become cancerous, they revert

to a fetal form and begin making AFP. Increased levels are associated most strongly with liver, testicular, and **ovarian cancer**. Seventy-percent of people with **liver cancer** have increased AFP levels. Levels indicate the extent of cancer. Serial measurements monitor treatment response.

Pregnant women and people with such noncancerous liver conditions as **cirrhosis** and hepatitis have moderately increased levels.

Beta-subunit human chorionic gonadotropin (Beta-HCG)

The beta-subunit of the hormone HCG is a marker for **testicular cancer** and cancers that begin in placental cells called trophoblasts. Women with **choriocarcinoma** (a cancer originating in the placenta following **pregnancy**) or molar pregnancy (a tumor inside the uterus) have increased levels of Beta-HCG, as do 70% of men with testicular cancer. Serial measurements monitor the progress and treatment of these cancers.

Cancer antigen 15-3 (CA 15-3)

CA 15-3 is produced by cells in the breast. Increased levels are associated with **breast cancer**. Rarely increased in women with early breast cancer, it is used to detect recurrence of cancer in women following treatment or **mastectomy**.

Cancer antigen 19-9 (CA 19-9)

CA 19-9 helps diagnose pancreatic cancer when combined with other test results and clinical findings. After diagnosis, levels help predict the success of surgery and to monitor the course of the cancer.

Not all people with pancreatic cancer have increased CA 19-9 levels. This marker is associated with a specific blood type. People with pancreatic cancer who are negative for this blood type will not have CA 19-9 in their blood. It is also increased in liver and gastrointestinal cancer and in such noncancerous diseases, as **pancreatitis** and **jaundice**.

Breast carcinoma-associated antigen (CA 27.29)

CA 27.29 is a marker for breast cancer. Eighty percent of women with breast cancer have an increased CA 27.29. Serial measurements monitor treatment response and identify recurrence.

Levels may also be increased in noncancerous breast disease and cancers of other tissues. It is not used to screen for breast cancer because women with small or localized breast tumors often have normal CA 27.29 levels.

Cancer antigen 125 (CA 125)

CA 125 is a protein made by ovarian cells and is a marker for ovarian cancer. Eighty percent of women with

ovarian cancer have increased CA 125 levels. Although the test is not sensitive and specific enough to be used for screening, it contributes to a diagnosis when combined with an ultrasound and pelvic examination. After diagnosis and treatment, serial measurements help detect remaining or recurrent cancer. A negative or normal result, however, does not guarantee the absence of cancer.

Women may have increased CA 125 levels during menstruation and pregnancy. Increased levels are also found in **pelvic inflammatory disease**, **endometriosis**, pancreatitis, liver disease, and non-ovarian cancers.

Carcinoembryonic antigen (CEA)

CEA is a protein made by fetal tissues, especially liver, intestinal, and pancreatic tissue. It disappears by birth but often reappears when cells from these tissues become cancerous.

CEA is most often associated with colorectal cancer, although it is not present in all people with this cancer. Pre-surgery CEA levels help stage the cancer and plan the surgery. After surgery, serial measurements indicate the surgery's success and watch for early signs of recurrence. When CEA is found in other body fluids, such as spinal fluid, it indicates cancer has spread.

CEA levels may be increased in many types of cancer: gastrointestinal, colorectal, liver, lung, pancreatic, liver, prostate, thyroid, and breast. People with such non-cancerous conditions as cirrhosis or peptic ulcer, and such inflammatory intestinal conditions as colitis or diverticulitis, also may have increased levels.

Prostate specific antigen (PSA)

PSA is used to screen for **prostate cancer**. A protein produced by the prostate gland, increased PSA levels are associated with prostate cancer. Men over the age of 50 years are advised to be screened annually for prostate cancer with a digital rectal exam and a PSA test. Men at high risk for prostate cancer, such as African-Americans or those with a family history, should begin screening at age 40. Once a diagnosis of prostate cancer is made, PSA levels help determine the stage of the cancer, monitor the response to treatment, and watch for recurrence.

PSA is also increased in benign prostatic hyperplasia (BPH), an **enlarged prostate** condition common in older men. Several calculations of the PSA have been developed to help tell the difference between BPH and prostate cancer: PSA density, PSA velocity, and ratio of free to total.

The PSA density calculates the concentration of PSA in the prostate gland. The volume of prostate gland is determined by a procedure called transrectal ultrasound (TRUS). A person with an enlarged prostate, as seen in BPH, has a lower PSA density than a person with prostate

KEY TERMS

AFP (Alpha-fetoprotein)—A tumor marker associated with liver, testicular, and ovarian cancer.

Beta-HCG (Beta-human chorionic gonadotropin)—A tumor marker associated with testicular cancer and tumors, such as choriocarcinoma and molar pregnancies, that begin in placental cells called trophoblasts.

CA 15-3 (Cancer antigen 15-3)—A tumor marker associated with breast cancer.

CA 19-9 (Cancer antigen 19-9)—A tumor marker associated with pancreatic cancer.

CA 27.29 (Breast carcinoma-associated antigen)—A tumor marker associated with breast cancer.

CA 125 (Cancer antigen 125)—A tumor marker associated with ovarian cancer.

CEA (Carcinoembryonic antigen)—A tumor marker associated with many cancers, especially liver, intestinal, and pancreatic.

PSA (Prostate specific antigen)—A tumor marker associated with prostate cancer.

Sensitivity—A test's ability to detect all cases of a disease.

Serial measurements—A series of measurements looking for an increase or decrease over time.

Specificity—A test's ability to detect only the disease in question.

Tumor markers—Substances, such as proteins, biochemicals, or enzymes, produced by tumor cells or by the body in response to tumor cells. Their levels in the blood help physicians evaluate people for certain kinds of cancer.

cancer. PSA velocity or rate calculates the change in PSA levels over time. A rapid increase in PSA is more likely due to cancer than BPH. The ratio of free PSA to total PSA also helps distinguish BPH from cancer. PSA exists either in a free state or bound to another substance. The percentage of free PSA is greater in BPH than cancer.

PSA levels may increase after ejaculation. Men are recommended to abstain from sexual intercourse or masturbation for 48 hours before the test. PSA levels may also increase after prostate manipulation following the digital rectal exam.

Preparation

Tumor marker tests require 5–10 mL of blood. A healthcare worker ties a tourniquet on the person's upper arm, locates a vein in the inner elbow region, and inserts a needle into that vein. Vacuum action draws the blood through the needle into an attached tube. Collection of the sample takes only a few minutes.

Aftercare

Discomfort or bruising may occur at the puncture site or the person may feel dizzy or faint. Pressure to the puncture site until the bleeding stops reduces bruising. Warm packs to the puncture site relieve discomfort.

Normal results

AFP:

- 99% of nonpregnant people have less than 15 ng/mL
- 95% have less than 6 ng/mL

Beta-HCG:

- Males less than 2.5 IU/L
- Female less than 5.0 IU/L
- Postmenopausal female less than 9.0 IU/L

CA 15-3:

- females have less than 40 U/mL

CA 19-9:

- less than 40 U/mL

CA 27.29:

- less than or equal to 5 ng/mL

PSA:

- less than 4 ng/mL (PSA levels increase with age)

Abnormal results

The meaning of an increased tumor marker level depends on the specific marker, the person's medical history, and why the test was done. Knowledge of the person's history, and additional tests and physical examinations are needed to correctly interpret tumor marker test results.

Resources

BOOKS

American Association of Clinical Chemistry. *Tumor Markers: Reclassification, Reimbursement & Recent Advances*. Washington, DC: American Association of Clinical Chemistry (AACC) Press, 1997.

- Wu, James T. "Diagnosis and Management of Cancer Using Serologic Tumor Markers." In *Clinical Diagnosis and Management by Laboratory Methods*. 19th ed. Ed. John B. Henry. Philadelphia: W. B. Saunders Co., 1996.
- Wu, James T., and Robert M. Makamura. *Human Circulating Tumor Markers: Current Concepts and Clinical Applications*. Chicago: American Society of Clinical Pathologists Press (ASCP) Press, 1997.

PERIODICALS

- Aziz, Douglas C. "Clinical Use of Tumor Markers Based on Outcome Analysis. CE-Update—Tumor Markers I." *Laboratory Medicine* (Nov. 1996): 760-764.
- Aziz, Douglas C. "Clinical Use of Tumor Markers Based on Outcome Analysis. CE-Update—Tumor Markers II." *Laboratory Medicine* (Dec. 1996): 817-821.
- Coley, Christopher M., et al. "Early Detection of Prostate Cancer. Part I: Prior Probability and Effectiveness of Tests." *Annals of Internal Medicine* (Mar. 1997): 394-406.
- Pamies, Rubens J., and Deborah R. Crawford. "Tumor Markers. An Update." *Medical Clinics of North America* (Jan. 1996): 185-199.
- Vashi, Apoorva R., and Joseph E. Oesterling. "Percent Free Prostate-Specific Antigen: Entering a New Era in the Detection of Prostate Cancer." *Mayo Clinic Proceedings* (Apr. 1997): 337-344.

ORGANIZATIONS

- American Cancer Society. 1599 Clifton Rd., NE, Atlanta, GA 30329-4251. (800) 227-2345. <<http://www.cancer.org>>.
- American Society of Clinical Oncology. 225 Reinekers Lane, Suite 650, Alexandria, VA 22314. (703) 299-0150. <<http://www.asco.org>>.
- National Cancer Institute. Building 31, Room 10A31, 31 Center Drive, MSC 2580, Bethesda, MD 20892-2580. (800) 422-6237. <<http://www.nci.nih.gov>>.

OTHER

- "Screening for Ovarian Cancer." *National Cancer Institute Page*. 11 June 1998 <<http://www.nci.nih.gov>>.
- "Screening for Prostate Cancer." *National Cancer Institute Page*. 11 June 1998 <<http://www.nci.nih.gov>>.

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A tumor inside the brain is being removed. (Photograph by Jennifer Watson-Holton, Custom Medical Stock Photo. Reproduced by permission.)

circumscribed and are generally easy to remove completely. In contrast, cancers pose some of the most difficult problems in all of surgery.

Currently 40% of all cancers are treated with surgery alone. In 55%, surgery is combined with other treatments—usually **radiation therapy or chemotherapy**.

The doctor needs to decide if surgery should be done at all. Because cancers spread (metastasize) to normal tissues, sometimes at the other end of the body, the ability of surgery to cure must be addressed at the outset. As long as the cancer is localized, the initial presumption is that cure should be attempted by removing it as soon as possible.

Non-curative surgery may make other treatments more effective. "Debulking" a cancer—making it smaller—is thought to assist radiation and chemotherapy to get to the remaining pieces of the cancer and be more effective.

Another important function surgery performs in cancer treatment is accurately assessing the nature and extent of the cancer. Most cancers cannot be adequately identified without a piece being placed under a microscope. This piece is obtained by surgery. Surgery is also the only way to determine exactly how far the tumor has spread. There are a few standard methods of comparing one cancer to another for the purposes of comparing treatments and estimating outcomes. These methods are called "staging." The most universal method is the TNM system.

- "T" stands for "tumor" and reflects the size of the tumor.
- "N" represents the spread of the cancer to lymph nodes, largely determined by those nodes removed at surgery that contain cancer cells. Since cancers spread mostly through the lymph system, this is a useful measure of their ability to disperse.
- "M" refers to the metastases, how far they are from the original cancer and how often they have multiplied.

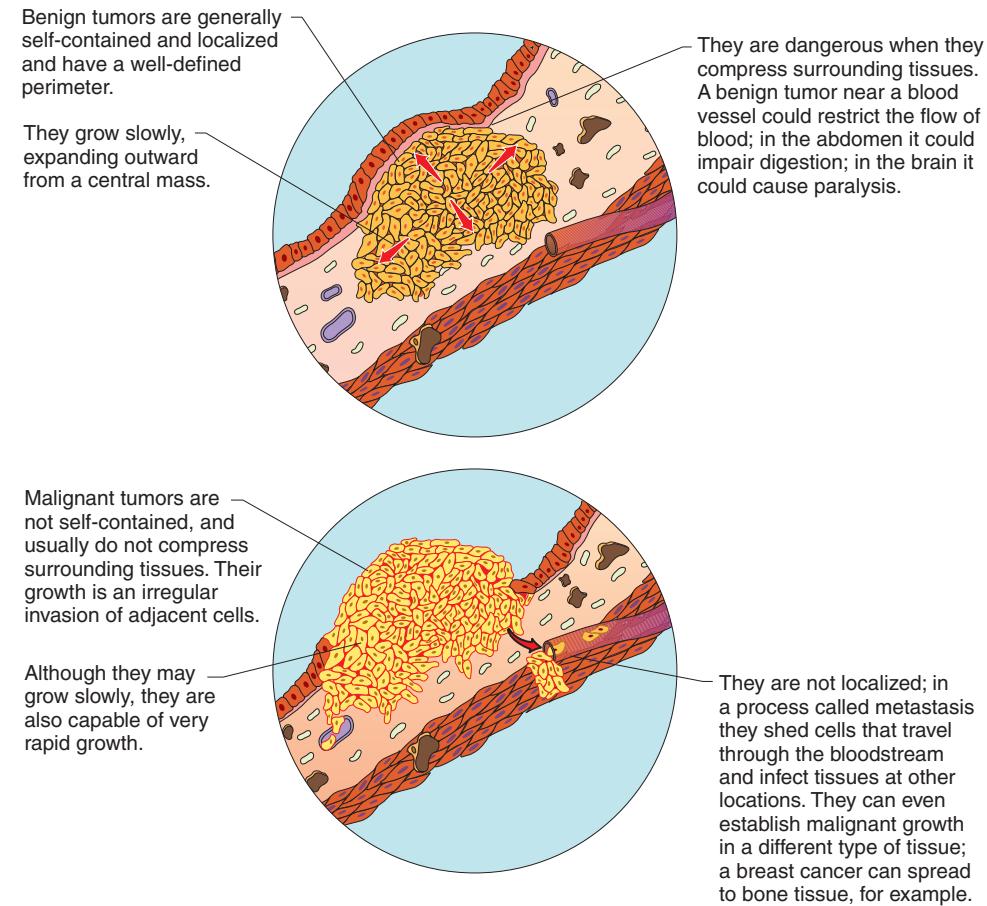
Tumor removal

Definition

Tumor removal is a surgical procedure to remove an abnormal growth.

Purpose

A tumor can be either benign, like a wart, or malignant, in which case it is a **cancer**. Benign tumors are well



A comparison of benign (top of illustration) and malignant tumor characteristics. (Illustration by Hans & Cassady, Inc.)

Other methods of staging include Duke's method and similar systems, which add to the above criteria the degree of invasion of the cancer into the surrounding tissues.

Staging is particularly important with such lymphomas as **Hodgkin's disease**. These cancers may appear in many places in the lymphatic system. Because they are very radiosensitive, radiation treatment is often curative if all the cancer is irradiated. Therefore, it must all be located. Surgery is a common, usually essential, method of performing this staging. If the disease is too widespread, the staging procedure will dictate chemotherapy instead of radiation.

Precautions

Curative cancer surgery demands special considerations. There is a danger of spreading or seeding the cancer during the process of removing it. Presuming the cancer cells can grow almost anywhere in the body they end up, the surgeon must not "spill" cells into the operating field

or "knock them loose" into the blood stream. Special techniques called "block resection" and "no touch" are used. Block resection means taking the entire specimen out as a single piece. "No touch" means that only the normal tissue removed with specimen is handled; the cancer itself is never touched. This prevents "squeezing" cancer cells out into the circulation. Further, in this technique pains are taken to clamp off the blood supply first, preventing cells from leaving by that route later in the surgery.

Description

Diagnostic biopsies

There are four types of biopsy techniques:

- Aspiration biopsy. A needle is inserted into the tumor and a sample is withdrawn.
- Needle biopsy. A special cutting needle is inserted into the core of the tumor and a core sample is cut out.

- Incisional biopsy. A portion of a large tumor is removed, usually before complete tumor removal.
- Excisional biopsy. A whole lesion is removed along with surrounding normal tissue.

Complete tumor removal

Once surgical removal has been decided, an oncologic surgeon will remove the tumor whole, taking with it a large section of the surrounding normal tissue. The healthy tissue is removed to minimize the risk of possible seeding.

Cytoreduction

When surgical removal of a tumor is unacceptable as a sole treatment, a portion of the tumor is removed to “debulk” the mass. Debulking aids radiation and chemotherapy treatments.

Aftercare

Retesting and periodical examinations are necessary to ensure that a tumor has not reformed after total removal.

Risks

The possibility of metastasis and seeding are risks that have to be considered in consultation with an oncologist.

Resources

BOOKS

- Longo, Dan D. “Approach to the Patient with Cancer.” In *Harrison’s Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.
 Morton, Donald M. “Oncology.” In *Principles of Surgery*, ed. Seymour I. Schwartz. New York: McGraw Hill Inc., 1989.

J. Ricker Polsdorfer, MD

Turner syndrome

Definition

Turner syndrome is a chromosomal disorder affecting females wherein one of the two X-chromosomes is defective or completely absent.

Description

Chromosomes are structures in the nucleus of every cell in the human body. Chromosomes contain the genetic information necessary to direct the growth and normal functioning of all cells and systems of the body. A nor-

mal individual has a total of 46 chromosomes in each cell, two of which are responsible for determining gender. Normally, females have two X-chromosomes and males have one X and one Y-chromosome.

In Turner syndrome, an error occurring very early in development results in an abnormal number and arrangement of chromosomes. Most commonly, an individual with Turner syndrome will be born with 45 chromosomes in each cell rather than 46. The missing chromosome is an X-chromosome. The affected person is always female.

The prevalence of Turner syndrome is widely reported as being approximately one per 2,000 live female births although researchers have reported prevalence rates that range from one in 3,125 to one in 5,000 live female births.

About 1% to 2% of all female conceptions have a missing X-chromosome. Of these, the majority (99%) spontaneously abort, usually during the first trimester of pregnancy. With ultrasound being used more frequently, researchers have realized that some pregnancies with a missing X-chromosome that progress into the second trimester are associated with nuchal cysts, severe lymphedema, or hydrops fetalis. These pregnancies are associated with a high frequency of fetal death.

Causes and symptoms

Turner’s syndrome is a disorder associated with characteristic defects in the X-chromosome. The most common presentation is a female with a single X-chromosome and an absent X-chromosome. A Greek study from 1999 reported that the intact X-chromosome was as likely to come from the mother as from the father. This means that there is no parental pattern of responsibility for the missing or defective X-chromosome.

Another less common genetic pattern for Turner Syndrome (35%) is a mosaic. A Danish study reported that mosaicism has an effect on malformations that are associated with Turner syndrome. Research reported in 1997 noted that the karyotype can have a significant effect on the growth of children with Turner syndrome.

The exact location of the genes on the X-chromosome involved in Turner syndrome has not been determined as of 2001. At present, evidence exists that there is a locus for stature on the distal portion of the short arm; there are loci for normal ovarian function on both the short and long arms; and there are loci contributing to fetal viability on the long arm of X.

Turner syndrome is characterized by retarded growth that leads to a small stature and frequent infertility. Individuals with Turner syndrome report an increased



A low hairline at the back of the neck is one of several characteristics of Turner syndrome. (Custom Medical Stock Photo. Reproduced by permission.)

incidence of **fractures** in childhood and osteoporotic fractures in adulthood. The incidence of **diabetes mellitus** (both insulin dependent and non-insulin dependent varieties) has been reported to be increased in Turner syndrome. Ischemic heart disease, **stroke** and **hypertension** are also more common.

Growth in children with Turner syndrome is characterized by a slight **intrauterine growth retardation**, relatively normal growth rates for the first several years of life, a progressive deceleration of growth later in childhood, and the lack of a pubertal growth spurt. Growth patterns of Chinese girls with Turner syndrome parallel those of Caucasians, although their ultimate height is still less than normal.

Contrary to earlier reports, most individuals with Turner syndrome are not mentally retarded. They may have some learning disabilities, particularly with regard to spatial perception, visual-motor coordination, and mathematics. As a result, the nonverbal IQ in Turner syndrome tends to be lower than the verbal IQ.

Cardiovascular malformations are well-recognized congenital anomalies in Turner syndrome. Dilation and dissection of the aorta are reported in approximately half of women with Turner syndrome. Because of the potential consequences of aortic dilation, some experts recommend screening all individuals with Turner syndrome. However, the specific timing for this screening remains controversial in 2001.

Juvenile arthritis, an autoimmune condition, has been recently (1998) associated with Turner syndrome. The prevalence seems to be at least six times greater than would be expected if the two conditions were only randomly associated. Women with Turner syndrome have an elevated prevalence rate of dental caries and such other periodontal conditions as gum disease and plaque.

Normal pubertal development and spontaneous menstrual periods do not occur in the majority of children with Turner' syndrome. It is estimated that 3–8% of girls with a single X-chromosome and 12–21% of females with sex chromosome mosaicism may have normal pubertal development and spontaneous menstrual periods. A few pregnancies have been reported in women with Turner syndrome.

Diagnosis

Turner syndrome is diagnosed on the basis of genetic analysis of chromosomes. This can be done prior to birth. However, the predictive value of **amniocentesis** in diagnosing Turner syndrome varies from 21–67%. There is no significant relation between the mother's age and risk of Turner's syndrome.

Treatment

Because it is so dangerous, experts suggest screening for **aortic dissection**, although the specific timing for this screening is controversial. Plastic surgery to correct webbing of the neck should be considered at an early age (before entering school) for girls with Turner syndrome.

Most individuals with Turner syndrome require female hormone therapy to promote development of secondary sexual characteristics and menstruation. The time of beginning therapy varies with individuals. Experts recommend that therapy begin when a woman expresses concern about her onset of **puberty**.

All women receiving long-term, exogenous female hormone therapy require periodic gynecological examinations, because those with Turner syndrome have an increased risk of developing neoplasms such as gonadoblastoma and dysgerminoma, which arise from their rudimentary streak gonads.

Prognosis

Most women with Turner syndrome can live relatively normal lives. The prognosis for a person with Turner syndrome is dependent on other conditions that may be present. Care must be taken to regularly monitor them for the health problems that are associated with Turner syndrome. For example, heart or kidney defects,

hearing loss, or the development of inflammatory bowel disease may significantly impact the quality of life. Without these types of conditions, however, their life expectancy is normal. Support will be necessary to help an adolescent girl cope with body image issues and to help some women accept the fact that they will never be able to have children.

Resources

BOOKS

- Hall, Judith G. "Chromosomal Clinical Abnormalities." In *Nelson Textbook of Pediatrics*, edited by Richard E Behrman, et al. 16th ed. Philadelphia: W.B. Saunders, 2000, pp. 325-334.
- Jones, K.L. "XO Syndrome." In *Smith's Recognizable Patterns of Human Malformation*, edited by Kenneth L. Jones and Judy Fletcher. 5th ed. Philadelphia: W.B. Saunders, 1997, pp 81-87.
- Plumridge, D. *Good Things Come in Small Packages: The Whys and Hows of Turner Syndrome*. Portland, OR: University of Oregon Health Sciences Center, 1987.
- Reiser, P.A., and L.E. Underwood. *Turner Syndrome: A Guide for Families*. Wayzata, MN: Turner Syndrome Society; 1992.

PERIODICALS

- Gravholt, C.H., et al. "Morbidity in Turner Syndrome." *Journal of Clinical Epidemiology* 51, no. 2 (February 1998): 147-158.
- Gravholt, C.H., et al. "Prenatal and Postnatal Prevalence of Turner's Syndrome: A Registry Study." *British Medical Journal* 312, no. 7022 (January 6, 1996): 16-21.
- Zinn, A.R., D.C. Page, and E.M. Fisher. "Turner Syndrome: The Case of the Missing Sex Chromosome." *Trends in Genetics* 9 (1993): 90-93.

ORGANIZATIONS

- American Academy of Pediatrics. 141 Northwest Point Blvd., Elk Grove Village, IL 60007-1098. (847) 434-4000. Fax: (847) 434-8000. <<http://www.aap.org/visit/contact.htm>>.
- Endocrine Society. 4350 East West Highway, Suite 500, Bethesda, MD 20814-4410. (301) 941-0200. Fax: (301) 941-0259. endostaff@endo-society.org.
- Human Growth Foundation. 997 Glen Cove Ave., Glen Head, NY 11545. (800) 451-6434. Fax: (516) 671-4055. <<http://www.hgfound.org>>.
- MAGIC Foundation for Children's Growth. 1327 N. Harlem Ave., Oak Park, IL 60302. (708) 383-0808 or (800) 362-4423. Fax: (708) 383-0899. <mary@magicfoundation.org>. <<http://www.magicfoundation.org/ghd.html>>.
- Turner Syndrome Society of Canada. 7777 Keele St, Floor 2, Concord, ONT L4K 1Y7. Canada (800) 465-6744 or (416) 660-7766. Fax: (416) 660-7450.
- Turner Syndrome Society of England. 2 Mayfield Ave., London, W41PW. UK 44 (0)181-994 7625. Fax: 44 (0)181-995 9075. <<http://www.exnet.com/staff/sys4/ts.html>> or <<http://www.tss.org.uk>>.

KEY TERMS

Chromosome—A microscopic thread-like structure found within each cell of the body that consists of a complex of proteins and DNA. Humans have 46 chromosomes arranged into 23 pairs. Changes in either the total number of chromosomes or their shape and size (structure) may lead to physical or mental abnormalities.

Mosaic—A term referring to a genetic situation in which an individual's cells do not have the exact same composition of chromosomes. In Down syndrome, this may mean that some of the individual's cells have a normal 46 chromosomes, while other cells have an abnormal 47 chromosomes.

Ovary—The female reproductive organ that produces the reproductive cell (ovum) and female hormones.

Zygote—The cell formed by the uniting of egg and sperm.

Turner Syndrome Society of the United States. 14450 T. C. Jester, Suite 260, Houston, TX 77014. (800) 365-9944 or (832) 249-9988. Fax: (832) 249-9987. <tesch@turner-syndrome-us.org>. <<http://www.turner-syndrome-us.org>>.

OTHER

- American Academy of Pediatrics. <<http://www.aap.org/visit/contact.htm>>.
- On-ramp Access. <<http://www.onr.com/ts-texas/turner.html>>.
- Turner Syndrome Support Society(UK). <<http://www.tss.org.uk/>>.
- University of Kansas Medical Center. <<http://www.kumc.edu/gec/support/turner.html>>.
- L. Fleming Fallon, Jr., MD, PhD, DrPH

Twins see **Multiple pregnancy**

2,3-diphosphoglycerate test

Definition

2,3-diphosphoglycerate (2,3-DPG) is a substance made in the red blood cells. It controls the movement of oxygen from red blood cells to body tissues. 2,3-DPG testing is done to help investigate both a deficiency in red blood cells (anemia) and an unexplained increase of red blood cells, called erythrocytosis.

Purpose

Hemoglobin, the protein in the blood that carries oxygen, uses 2,3-DPG to control how much oxygen is released once the blood gets out into the tissues. The more 2,3-DPG in the cell, the more oxygen is delivered to body tissues. Conversely, the less 2,3-DPG in the cell, the less oxygen is delivered.

Increasing the amount of 2,3-DPG is the body's primary way of responding to a lack of oxygen. Anemia, obstructive lung disease, **cystic fibrosis**, and **congenital heart disease** are all accompanied by increases in 2,3-DPG. When more oxygen is required because of increased metabolism, such as in **hyperthyroidism**, more 2,3-DPG is produced.

Decreased 2,3-DPG results from an inherited lack of the red blood cell enzymes 2,3-DPG mutase and 2,3-DPG phosphatase. These enzymes are needed to make 2,3-DPG. Without 2,3-DPG to control the movement of oxygen to its tissues, the body responds by making more red blood cells, a condition called erythrocytosis. The outside membrane of the cell is weakened, causing it to have an irregular shape and burst, or hemolyze, easily. This condition is called nonspherocytic **hemolytic anemia**.

2,3-DPG levels are important in large blood transfusions, because stored blood quickly loses 2,3-DPG and its ability to deliver oxygen. After **transfusion**, the red cells rebuild the 2,3-DPG, but it takes about 24 hours to regain a normal level of 2,3-DPG and hemoglobin function.

Description

In the laboratory, a person's serum is mixed with a substance that will react with 2,3-DPG. The end product of this reaction is measured; and from that measurement, the amount of 2,3-DPG in the person's serum is determined. Results are usually available the next day.

Preparation

This test requires drawing 5–10 mL of blood. The patient should not **exercise** before having the blood drawn. Exercise increases the body's need for oxygen and could cause a temporary increase in levels of 2,3-DPG.

Aftercare

Discomfort or bruising may occur at the puncture site, or the person may feel dizzy or faint. Pressure to the puncture site until the bleeding stops will reduce bruising. Warm packs to the puncture site will relieve discomfort.

Normal results

Normal results will vary based on the laboratory and testing methods used.

KEY TERMS

Anemia—A reduction in the number of erythrocytes or red blood cells. Erythrocytes are necessary to form hemoglobin for transporting oxygen.

Erythrocytosis—Increased production of red blood cells.

Hemoglobin—A protein within the red blood cell that carries oxygen.

Nonspherocytic hemolytic anemia—Anemia caused by variably shaped red blood cells that burst, or hemolyze, easily.

Abnormal results

Decreased levels of 2,3-DPG are found in cases of erythrocytosis and nonspherocytic hemolytic anemia caused by 2,3-DPG mutase and 2,3-DPG phosphatase deficiencies. Lower levels are also commonly found after large blood transfusions.

Increased levels of 2,3-DPG are found in conditions in which the body needs more oxygen, such as anemia, obstructive lung disease, cystic fibrosis, congenital heart disease, and hyperthyroidism. High altitudes and participating in exercise sessions before the test can also give false high values.

Resources

BOOKS

Clinical Diagnosis and Management by Laboratory Methods. 19th ed. Ed. John B. Henry. Philadelphia: W. B. Saunders Co., 1996.

Pagana, Kathleen Deska. Mosby's Manual of Diagnostic and Laboratory Tests. St. Louis: Mosby, Inc., 1998.

Widmann's Clinical Interpretation of Laboratory Tests. 10th ed. Ed. Ronald A. Sacher, et al. Philadelphia: F. A. Davis Co., 1991.

PERIODICALS

Hsia, Connie C. W. "Respiratory Function of Hemoglobin." *New England Journal of Medicine* 338 (Jan. 1998): 239-247.

Nancy J. Nordenson

2,3-DPG see **2,3-diphosphoglycerate test**

Tylenol see **Acetaminophen**

Tympanic membrane perforation see
Perforated eardrum

Tympanometry see **Audiometry**

Typhoid fever

Definition

Typhoid fever is a severe infection caused by a bacterium, *Salmonella typhi*. *S. typhi* is in the same family of bacteria as the type spread by chicken and eggs, commonly known as “salmonella poisoning,” or **food poisoning**. *S. typhi* bacteria do not have vomiting and **diarrhea** as the most prominent symptoms of their presence in humans. Instead, persistently high fever is the hallmark of *S. typhi* infection.

Description

S. typhi bacteria are passed into the stool and urine of infected patients. They may continue to be present in the stool of asymptomatic carriers, who are persons who have recovered from the symptoms of the disease but continue to carry the bacteria. This carrier state occurs in about 3% of all individuals recovered from typhoid fever.

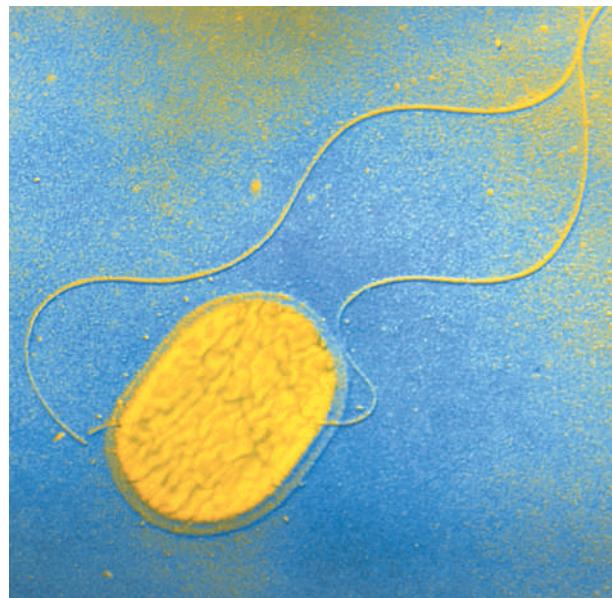
Typhoid fever is passed from person to person through poor hygiene, such as incomplete or no hand washing after using the toilet. Persons who are carriers of the disease and who handle food can be the source of epidemic spread of typhoid. One such individual gave her name to the expression “Typhoid Mary,” a name given to someone whom others avoid.

Typhoid fever is a particularly difficult problem in parts of the world with poor sanitation practices. In the United States, most patients who contract typhoid fever have recently returned from travel to another country where typhoid is much more common, including Mexico, Peru, Chile, India, and Pakistan.

Causes and symptoms

S. typhi must be ingested to cause disease. Transmission often occurs when a person in the carrier state does not wash hands thoroughly (or not at all) after defecation and serves food to others. This pathway is sometimes called the fecal-oral route of disease transmission. In countries where open sewage is accessible to flies, the insects land on the sewage, pick up the bacteria, and then contaminate food to be eaten by humans.

After being swallowed, the *S. typhi* bacteria head down the digestive tract, where they are taken in by cells called mononuclear phagocytes. These phagocytes are cells of the immune system, whose job it is to engulf and kill invading bacteria and viruses. In the case of *S. typhi*, however, the bacteria are able to survive ingestion by the phagocytes, and multiply within these cells. This period of time, during which the bacteria are multiplying within



Transmission electron microscopy (TEM) scan of *Salmonella typhi*, the bacteria which causes typhoid fever in humans.
(Custom Medical Stock Photo. Reproduced by permission.)

the phagocytes, is the 10- to 14-day incubation period of typhoid fever. When huge numbers of bacteria fill an individual phagocyte, they spill out of the cell and into the bloodstream, where their presence begins to cause symptoms.

The presence of increasingly large numbers of bacteria in the bloodstream (**bacteremia**) is responsible for an increasingly high fever, which lasts throughout the four to eight weeks of the disease in untreated individuals. Other symptoms of typhoid fever include **constipation** (at first), extreme **fatigue**, **headache**, joint **pain**, and a rash across the abdomen known as rose spots.

The bacteria move from the bloodstream into certain tissues of the body, including the gallbladder and lymph tissue of the intestine (called Peyer's patches). The tissue's response to this invasion causes symptoms ranging from inflammation of the gallbladder (**cholecystitis**) to intestinal bleeding to actual perforation of the intestine. Perforation of the intestine refers to an actual hole occurring in the wall of the intestine, with leakage of intestinal contents into the abdominal cavity. This leakage causes severe irritation and inflammation of the lining of the abdominal cavity, which is called **peritonitis**. Peritonitis is a frequent cause of **death** from typhoid fever.

Other complications of typhoid fever include liver and spleen enlargement, sometimes so great that the spleen ruptures or bursts; anemia, or low red blood cell count due to blood loss from the intestinal bleeding; joint infections, which are especially common in

patients with sickle cell anemia and immune system disorders; **pneumonia** caused by a bacterial infection—usually *Streptococcus pneumoniae*—which is able to take hold due to the patient's weakened state; heart infections; and **meningitis** and infections of the brain, which cause mental confusion and even **coma**. It may take a patient several months to recover fully from untreated typhoid fever.

Diagnosis

In some cases, the doctor may suspect the diagnosis if the patient has already developed the characteristic rose spots, or if he or she has a history of recent travel in areas with poor sanitation. The diagnosis, however, is confirmed by a **blood culture**. Samples of a patient's stool, urine, and bone marrow can also be used to grow *S. typhi* in a laboratory for identification under a microscope. Cultures are the most accurate method of diagnosis. Blood cultures usually become positive in the first week of illness in 80% of patients who have not taken **antibiotics**.

Treatment

Antibiotics are the treatment of choice for typhoid fever. Chloramphenicol (Chloromycetin) is the most effective medication for *S. typhi*. The patient's symptoms begin to improve slightly after only 24–48 hours of receiving the medication. Another drug, ceftriaxone (Rocephin), has been used as well, and is also extremely effective. It lowers fever fairly quickly.

Carriers of *S. typhi* must be treated even when they do not show any symptoms of the infection, because carriers are responsible for the majority of new cases of typhoid fever. Eliminating the carrier state is actually a fairly difficult task. It requires treatment with one or even two different medications over a period of four to six weeks. In the case of a carrier with **gallstones**, surgery may need to be performed to remove the gallbladder. This measure is necessary because typhoid bacteria are often housed in the gallbladder, where they may survive in spite of antibiotic treatment.

Prognosis

The prognosis for recovery is good for most patients. In the era before effective antibiotics were discovered, about 12% of all typhoid fever patients died of the infection. Now, however, fewer than 1% of patients who receive prompt antibiotic treatment will die. The mortality rate is highest in the very young and very old, and in patients suffering from **malnutrition**. The most ominous signs are changes in a patient's state of consciousness, including stupor or coma.

KEY TERMS

Asymptomatic—A state in which a person experiences no symptoms of a disease.

Bacteremia—Bacteria in the blood.

Carrier—A person who has a particular disease agent present within his/her body, and can pass this agent on to others, but who displays no symptoms of infection.

Epidemic—A large number of cases of the same disease or infection all occurring within a short time period in a specific location.

Mononuclear phagocyte—A type of cell of the human immune system that ingests bacteria, viruses, and other foreign matter, thus removing potentially harmful substances from the bloodstream. These substances are usually then digested within the phagocyte.

Rose spots—A pinkish rash across the trunk or abdomen that is a classic sign of typhoid fever.

Prevention

Hygienic sewage disposal systems in a community as well as proper personal hygiene are the most important factors in preventing typhoid fever. Immunizations are available for travelers who expect to visit countries where *S. typhi* is a known public health problem. Some of these immunizations provide only short-term protection (for a few months), while others may be effective for several years. Efforts are being made to develop immunizations that provide a longer period of protection with fewer side effects from the vaccine itself.

Resources

BOOKS

"Salmonellosis." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.
Stoffman, Phyllis. *The Family Guide to Preventing and Treating 100 Infectious Diseases*. New York: John Wiley & Sons, 1995.

PERIODICALS

Zenilman, J. M. "Typhoid Fever." *Journal of the American Medical Association* (10 Sept. 1997): 847+.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Typhus

Definition

Several different illnesses called “typhus” exist, all of them caused by one of the bacteria in the family *Rickettsiae*. Each illness occurs when the bacteria is passed to a human through contact with an infected insect.

Description

The four main types of typhus are:

- epidemic typhus
- Brill-Zinsser disease
- endemic or murine typhus
- scrub typhus

These diseases are all somewhat similar, although they vary in terms of severity. The specific type of *Rickettsia* that causes the disease also varies, as does the specific insect that can pass the bacteria along.

Epidemic typhus is caused by *Rickettsia prowazekii*, which is carried by body lice. When the lice feed on a human, they may simultaneously defecate. When the person scratches the bite, the feces (which carry the bacteria) are scratched into the wound. Body lice are common in areas in which people live in overcrowded, dirty conditions, with few opportunities to wash themselves or their clothing. Because of this fact, this form of typhus occurs simultaneously in large numbers of individuals living within the same community; that is, in epidemics. This type of typhus occurs when cold weather, poverty, war, and other disasters result in close living conditions that encourage the maintenance of a population of lice living among humans. Epidemic typhus is now found in the mountainous regions of Africa, South America, and Asia.

Brill-Zinsser disease is a reactivation of an earlier infection with epidemic typhus. It affects people years after they have completely recovered from epidemic typhus. When something causes a weakening of their immune system (like aging, surgery, illness), the bacteria can gain hold again, causing illness. This illness tends to be extremely mild.

Endemic typhus is carried by fleas. When a flea lands on a human, it may defecate as it feeds. When the person scratches the itchy spot where the flea was feeding, the bacteria-laden feces are scratched into the skin, thus causing infection. The causative bacteria is called *Rickettsia typhi*. Endemic typhus occurs most commonly in warm, coastal regions. In the United States, southern Texas and southern California have the largest number of cases.

Scrub typhus is caused by *Rickettsia tsutsugamushi*. This bacteria is carried by mites or chiggers. As the mites

feed on humans, they deposit the bacteria. Scrub typhus occurs commonly in the southwest Pacific, southeast Asia, and Japan. It is a very common cause of illness in people living in or visiting these areas. It occurs more commonly during the wet season.

Causes and symptoms

The four types of typhus cause similar types of illnesses, though varying in severity.

Epidemic typhus causes **fever**, **headache**, weakness, and muscle aches. It also causes a rash composed of both spots and bumps. The rash starts on the back, chest, and abdomen, then spreads to the arms and legs. The worst types of complications involve swelling in the heart muscle or brain (**encephalitis**). Without treatment, this type of typhus can be fatal.

Brill-Zinsser disease is quite mild, resulting in about a week-long fever, and a light rash similar to that of the original illness.

Endemic typhus causes about 12 days of high fever, with chills and headache. A light rash may occur.

Scrub typhus causes a wide variety of effects. The main symptoms include fever, headache, muscle aches and pains, **cough**, abdominal **pain**, **nausea and vomiting**, and **diarrhea**. Some patients experience only these symptoms. Some patients develop a rash, which can be flat or bumpy. The individual spots eventually develop crusty black scabs. Other patients go on to develop a more serious disease, in which encephalitis, **pneumonia**, and swelling of the liver and spleen (hepatosplenomegaly) occur.

Diagnosis

A number of tests exist that can determine the reactions of a patient’s antibodies (immune cells in the blood) to the presence of certain viral and bacterial markers. When the antibodies react in a particular way, it suggests the presence of a rickettsial infection. Many tests require a fair amount of time for processing, so practitioners will frequently begin treatment without completing tests, simply on the basis of a patient’s symptoms.

Treatment

The **antibiotics** tetracycline or chloramphenicol are used for treatment of each of the forms of typhus.

Prognosis

The prognosis depends on what types of complications an individual patient experiences. While children usually recover well from epidemic typhus, older adults

KEY TERMS

Antibody—Specialized cells of the immune system, which can recognize organisms that invade the body (such as bacteria, viruses, and fungi). The antibodies are then able to set off a complex chain of events designed to kill these foreign invaders.

Endemic—Occurring naturally and consistently in a particular area.

Epidemic—A large cluster of cases all occurring at about the same time within a specific community or region.

may have as much as a 60% **death** rate without treatment. Brill-Zinsser, on the other hand, carries no threat of death. People usually recover uneventfully from endemic typhus, although the elderly, those with other medical problems, or people mistakenly treated with sulfa drugs may have a 1% death rate from the illness. Scrub typhus responds well to appropriate treatment, but untreated patients have a death rate of about 7%.

Prevention

Prevention for each of these forms of typhus includes avoidance of the insects that carry the causative bacteria. Other preventive measures include good hygiene and the use of insect repellents.

Resources

BOOKS

Walker, David, et al. "Rickettsial Diseases." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Tzanck preparation

Definition

Tzanck preparation is a rapid test done to diagnose infections caused by herpesviruses. Cells are examined under a microscope for signs of infection.

Purpose

Herpesviruses are responsible for several superficial infections. Varicella zoster virus causes **chickenpox** and **shingles**, herpes simplex type 1 causes the **common cold** sore or **fever** blister, and herpes simplex type 2 causes the sexually transmitted disease **genital herpes**. They are all characterized by blisters and ulcers.

Physicians usually can diagnose herpes infections simply by looking at the type of blisters and ulcers, and their distribution on the person's body. Sometimes laboratory evidence of herpes is needed to confirm the diagnosis. For example, herpes can be devastating to a newborn baby or a person with a weakened immune system. Treatment can begin once herpes is confirmed in a laboring mother's genital ulcers or in the skin blisters of an immunocompromised person. A lab tries to grow (culture) the virus that may be present in the blister. This lab test takes several days to complete, but the Tzanck preparation takes minutes.

Description

The Tzanck preparation is done by smearing cells taken from a fresh blister or ulcer onto a microscope slide. The cells are stained with a special stain, such as Wright's stain, and then examined under a microscope for characteristic changes caused by a herpesvirus. Herpes causes giant cells with multiple nuclei. The shape of each nucleus appears molded to fit together with those adjacent. The background of the cell looks like ground glass and contains small dark spots called inclusion bodies.

Tzanck preparation is also called a Tzanck smear, herpes stain for inclusion bodies, or inclusion bodies stain. Results are available the same or following day, often within minutes.

Preparation

A fresh blister is opened with a scalpel or sterile needle. The physician scrapes the base of the blister with the scalpel, gathers as much cellular material as possible, and gently spreads it on a microscope slide.

Normal results

A normal smear shows no evidence of a herpes infection. This test may also have false negatives. Studies have shown that the Tzanck preparation shows signs of infection in only 50–79% of people with a herpes infection. A negative Tzanck preparation may have to be confirmed by a herpes culture.

Abnormal results

A smear that shows evidence of herpes infection does not distinguish between the various infections

caused by herpes virus. The physician uses the person's symptoms and other clinical findings to distinguish between these infections. In certain cases, the physician will follow a positive Tzanck smear with a culture for confirmation.

Resources

BOOKS

- Henry, John B., ed. *Clinical Diagnosis and Management by Laboratory Methods*. 19th ed. Philadelphia: W. B. Saunders Co., 1996.
- Isada, Carlos M., et al. *Infectious Diseases Handbook*. Hudson: Lexi-Comp Inc., 1995.

Nancy J. Nordenson

Tzanck smear see **Tzanck preparation**

U

Ulcer surgery

Definition

Ulcer surgery is a procedure used to cure peptic ulcer disease when medications have failed.

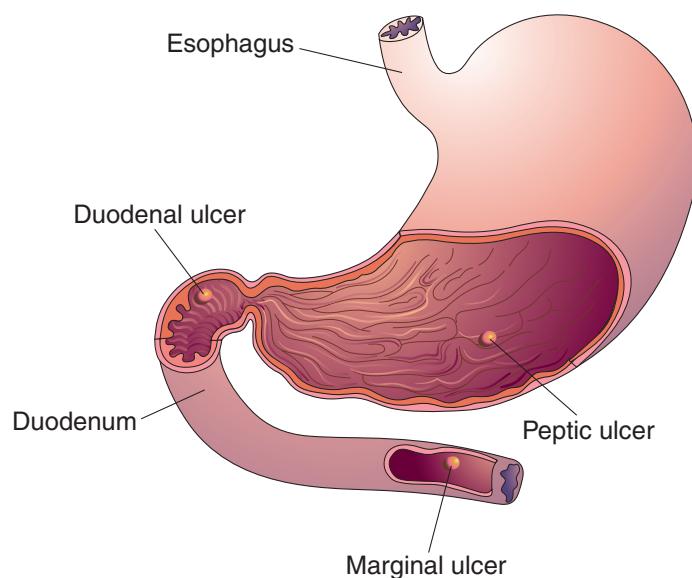
Purpose

Ulcer surgery is used to relieve a present peptic ulcer disease and to prevent recurrence of it.

Surgery is usually required if the ulcer is in one of the following states:

- perforated and overflowed into the abdomen
- scarred or swelled so much that the bowel is obstructed
- acute bleeding
- defied all other types of treatment

The need for ulcer surgery has diminished greatly over the past 20–30 years due to the discovery of two new classes of drugs and the presence of the causal germ *Helicobacter pylori* in the stomach. The drugs are the H₂ blockers such as cimetidine and ranitidine and the proton pump inhibitors such as omeprazole. These effectively arrest acid production. *H. pylori* can be eliminated from most patients with a combination of **antibiotics** and bismuth.



Common sites of ulcers in the human stomach. The need for ulcer surgery has diminished over the past 20-30 years due to the discovery that *Helicobacter pylori*, an infectious bacterium, plays a major role in causing ulcers. *H. pylori* can be eliminated from most patients with a combination of antibiotics and bismuth. (Illustration by Electronic Illustrators Group.)

Precautions

There is a tumor of the pancreas that produces a hormone called gastrin. Gastrin causes ulcers by stimulating acid production. If this disease—Zollinger-Ellison syndrome—does not respond to medical treatment, either the tumor or the entire stomach must be removed.

Description

The two primary goals of ulcer surgery, elimination of the current problem and prevention of future problems bring with them a third problem—to perpetuate the normal function of the bowel. The vagus nerves relax the pylorus, allowing the stomach to empty. Cutting the vagus nerves, while reducing the stomach's acid production, also prevents stomach emptying. Therefore, the procedures described must guarantee stomach emptying along with their other goals.

Total gastrectomy

Removing the entire stomach is done only for resistant Zollinger-Ellison syndrome or extensive cancers.

Antrectomy

The lower half of the stomach makes most of the acid and gets all the peptic ulcers above the duodenum. Removing it leaves little place for ulcers to form and little acid to produce them.

Vagotomy

Cutting the vagus nerves can be done in three ways:

- The main nerves can be cut completely as they enter the abdomen from the chest.
- The branches that go to the stomach can be cut as they leave the main nerves.
- The tiny branches that stimulate acid production can be cut on the surface of the stomach.

Pyloroplasty

Opening up the valve at the outlet of the stomach guarantees that the stomach can empty, even without vagus nerve stimulation. **Pyloroplasty** is ordinarily done by cutting across the muscle that surrounds the outlet. It can also be done by passing a balloon down from the mouth and inflating it forcefully to stretch out the pylorus (opening from the stomach to the intestine).

Close perforation

For some patients all that can be done is to close the hole in the bowel and wait for the patient to recover before initiating corrective surgery.

Billroth I and II

After removing a piece of the stomach, the remainder must be reattached to the rest of the bowel. Simply joining the upper stomach back to the duodenum is called a Billroth I or gastroduodenostomy. It is sometimes better to attach the stomach with another piece of bowel (the jejunum), creating a "y" with the bile drainage and the duodenum forming the second branch of the "y." This part of the procedure is called a gastrojejunostomy. A gastroenterostomy is a more general term for connecting the stomach with any piece of bowel.

A selective **vagotomy** can be done alone. A complete vagotomy requires either a pyloroplasty or antrectomy. An antrectomy must be reconnected with either a Billroth I or a Billroth II.

Some of these procedures are now being done through a laparoscope.

Risks

All of these procedures carry risks, generally in proportion to their benefits. The more extensive surgeries such as vagotomy and antrectomy with Billroth II reconnection have the highest success rate and the highest complication rate.

Complications include:

- Diarrhea after a meal
- Dumping syndrome occurring after a meal and characterized by sweating, abdominal **pain**, vomiting, light-headedness, and diarrhea
- Hypoglycemia after a meal
- Alkaline reflux **gastritis** marked by abdominal pain, vomiting of bile, diminished appetite, and iron-deficiency anemia
- Recurrence of an ulcer
- Malabsorption of necessary nutrients, especially iron, in patients who have had all or part of their stomachs removed.

Resources

BOOKS

- Debas, Haile T., and Susan L. Orloff. "Surgical Therapy." In *Cecil Textbook of Medicine*, ed. J. Claude Bennett and Fred Plum. Philadelphia: W. B. Saunders Co., 1996.
- Friedman, Lawrence S., and Walter L. Peterson. "Peptic Ulcer and Related Disorders." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.
- Moody, Frank G., et al. "Stomach." In *Sleisenger & Fordtran's Gastrointestinal and Liver Disease*, ed. Mark Feldman, et al. Philadelphia: W. B. Saunders Co., 1998.

KEY TERMS

- Gastrin**—A type of hormone that produces gastric juice.
- Hypoglycemia**—An abnormal decrease in blood sugar level.
- Jejunum**—Section of the small intestine.
- Laparoscope**—A pencil-thin telescope that allows surgery to be done through half-inch incisions.
- Pylorus**—The opening from the stomach to the intestine.
- Vagus nerve**—Cranial nerves that supply the internal organs (viscera).
- Zollinger-Ellison syndrome**—A syndrome marked by peptic ulcers and gastrinomas in the pancreas.

"Stomach and Duodenum." In *Current Surgical Diagnosis and Treatment*. 10th ed. Ed. Lawrence W. Way. Stamford: Appleton & Lange, 1994.

J. Ricker Polsdorfer, MD

Ulcerative colitis

Definition

Ulcerative colitis is a form of inflammatory bowel disease (IBD). It causes swelling, ulcerations, and loss of function of the large intestine.

Description

The primary problem in IBD is inflammation, as the name suggests. Inflammation is a process that often occurs in order to fight off foreign invaders in the body, including viruses, bacteria, and fungi. In response to such organisms, the body's immune system begins to produce a variety of cells and chemicals intended to stop the invasion. These immune cells and chemicals, however, also have direct effects on the body's tissues, resulting in heat, redness, swelling, and loss of function. No one knows what starts the cycle of inflammation in IBD, but the result is a swollen, boggy intestine.

In ulcerative colitis, the inflammation affects the lining of the rectum and large intestine. It is thought that the inflammation begins in the last segment of large intestine, which empties into the rectum (sigmoid colon). This

inflammation may spread through the entire large intestine, but only rarely affects the very last section of the small intestine (ileum). The rest of the small intestine remains normal.

Ulcerative colitis differs from **Crohn's disease**, which is a form of IBD that affects both the small and large intestines. The inflammation of ulcerative colitis occurs only in the lining of the intestine (unlike Crohn's disease which affects all of the layers of the intestinal wall). As the inflammation continues, the tissue of the intestine begins to slough off, leaving pits (ulcerations) which often become infected.

Like Crohn's disease, ulcerative colitis occurs in all age groups, with the most common age of diagnosis being 15–35 years of age. Men and women are affected equally. Whites are more frequently affected than other racial groups, and people of Jewish origin have 3–6 times greater likelihood of suffering from any IBD. IBD is familial; an IBD patient has a 20% chance of having other relatives who are fellow sufferers.

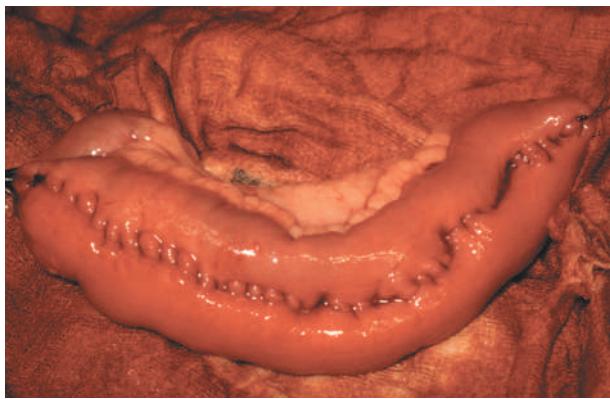
Causes and symptoms

No specific cause of ulcerative colitis has been identified. Although no organism (virus, bacteria, or fungi) has been found to set off the cycle of inflammation that occurs in ulcerative colitis, some researchers continue to suspect that some such organism is responsible for initiating the cycle. Other researchers are concentrating on identifying some change in the cells of the colon that would make the body's immune system accidentally begin treating those cells as foreign invaders. Other evidence for such a disorder of the immune system includes the high number of other immune disorders that tend to accompany ulcerative colitis.

The first symptoms of ulcerative colitis are abdominal cramping and **pain**, a sensation of urgent need to have a bowel movement (defecate), and blood and pus in the stools. Some patients experience **diarrhea**, **fever**, and weight loss. If the diarrhea continues, signs of severe fluid loss (**dehydration**) begin to appear, including low blood pressure, fast heart rate, and **dizziness**.

Severe complications of ulcerative colitis include perforation of the intestine (in which the wall of the intestine develops a hole), toxic dilation of the colon (in which the colon become quite large in diameter), and the development of **colon cancer**.

Intestinal perforation occurs when long-standing inflammation and ulceration of the intestine weakens the wall to such a degree that a hole occurs. This is a life-threatening complication, because the contents of the intestine (which under normal conditions contains a large



A specimen of a colon indicating ulcerative colitis. (Photo Researchers, Inc. Reproduced by permission.)

number of bacteria) spill into the abdomen. The presence of bacteria in the abdomen can result in a massive infection called **peritonitis**.

Toxic dilation of the colon is thought to occur because the intestinal inflammation interferes with the normal function of the muscles of the intestine. This allows the intestine to become lax, and its diameter begins to increase. The enlarged diameter thins the walls further, increasing the risk of perforation and peritonitis. When the diameter of the intestine is quite large, and infection is present, the condition is referred to as "toxic megacolon."

Patients with ulcerative colitis have a significant risk of developing colon **cancer**. This risk seems to begin around 10 years after diagnosis of ulcerative colitis. The risk becomes statistically greater every year:

- At 10 years, the risk of cancer is about 0.5–1%.
- At 15 years, the risk of cancer is about 12%.
- At 20 years, the risk of cancer is about 23%.
- At 24 years, the risk of cancer is about 42%.

The overall risk of developing cancer seems to be greatest for those patients with the largest extent of intestine involved in ulcerative colitis.

Patients with ulcerative colitis also have a high chance of experiencing other disorders, including inflammation of the joints (arthritis), inflammation of the vertebrae (spondylitis), ulcers in the mouth and on the skin, the development of painful, red bumps on the skin, inflammation of several areas of the eye, and various disorders of the liver and gallbladder.

Diagnosis

Diagnosis is first suspected based on the symptoms that a patient is experiencing. Examination of the stool

will usually reveal the presence of blood and pus (white blood cells). Blood tests may show an increase in the number of white blood cells, which is an indication of inflammation occurring somewhere in the body. The blood test may also reveal anemia, particularly when a great deal of blood has been lost in the stool.

The most important method of diagnosis is endoscopy, during which a doctor passes a flexible tube with a tiny, fiberoptic camera device through the rectum and into the colon. The doctor can then examine the lining of the intestine for signs of inflammation and ulceration that might indicate ulcerative colitis. A tiny sample (biopsy) of the intestine will be removed through the endoscope, which will be examined under a microscope for evidence of ulcerative colitis. Because of the increased risk of cancer in patients with ulcerative colitis, endoscopic exam will need to be repeated frequently. Biopsies should be taken regularly, to closely monitor the intestine for the development of cancer or precancerous changes.

X-ray examination is helpful to determine the amount of intestine affected by the disease. However, x-ray examinations requiring the use of barium should be delayed until treatment has begun. Barium is a chalky solution that the patient drinks or is administered through the rectum and into the intestine (enema). The presence of barium in the intestine allows more detail to be seen on x-ray pictures. However, because of the risk of intestinal perforation in ulcerative colitis, most doctors begin treatment before stressing the wall of the intestine with the barium solution.

Treatment

Treatment for ulcerative colitis addresses the underlying inflammation, as well as the problems occurring due to continued diarrhea and blood loss.

Inflammation is treated with a drug called sulfasalazine. Sulfasalazine is made up of two parts. One part is related to the sulfa **antibiotics**; the other part is a form of the anti-inflammatory chemical salicylic acid (related to **aspirin**). Sulfasalazine is not well-absorbed from the intestine, so it stays mostly within the intestine, where it is broken down into its components. It is believed to be primarily the salicylic acid component that is active in treating ulcerative colitis, by fighting inflammation. For patients who do not respond to sulfasalazine, steroid medications (such as prednisone) are the next choice.

Depending on the degree of blood loss, a patient with ulcerative colitis may require blood transfusions and fluid replacement through a needle in the vein (intravenous or IV). Medications that can slow diarrhea must be used with great care, because they may actually cause the development of toxic megacolon.

A patient with toxic megacolon requires close monitoring and care in the hospital. He or she will usually be given steroid medications through an IV, and may be put on antibiotics. If these measures do not improve the situation, the patient will have to undergo surgery to remove the colon. This is done because the risk of **death** after perforation of toxic megacolon is greater than 50%.

Similarly, a patient with proven cancer of the colon, or even a patient who shows certain signs thought to indicate a precancerous condition, will need his or her colon removed. Removal of the colon is called a colectomy. When a colectomy is performed, a piece of the small intestine (ileum) is pulled through an opening in the abdomen. This bit of intestine is fashioned surgically to allow a special bag to be placed over it, in order to catch the body's waste (feces) which no longer can be passed through the large intestine and out of the anus. This opening, which will remain for the duration of the patient's life, is called an ileostomy.

Prognosis

Remission refers to a disease becoming inactive for a period of time. The rate of remission of ulcerative colitis (after a first attack) is nearly 90%. Those individuals whose colitis is confined primarily to the left side of the large intestine have the best prognosis. Those individuals with extensive colitis, involving most or all of the large intestine, have a much poorer prognosis. Recent studies show that about 10% of these patients will have died by 10 years after diagnosis. About 20–25% of all ulcerative colitis patients will require colectomy. Unlike the case for patients with Crohn's disease, however, such radical surgery results in a cure of the disease.

Resources

BOOKS

- Glickman, Robert. "Inflammatory Bowel Disease: Ulcerative Colitis and Crohn's Disease." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.
- Long, James W. *The Essential Guide to Chronic Illness*. New York: Harperperennial, 1997.
- Sabil, Fred. *Crohn's Disease and Ulcerative Colitis*. Buffalo, NY: Firefly Books, 1997.

PERIODICALS

- Martin, Frances L. "Ulcerative Colitis." *American Journal of Nursing* 97 (Aug. 1997): 38+.
- Peppercorn, Mark A., and Susannah K. Gordon. "Making Sense of a Mystery Ailment: Inflammatory Bowel Disease." *Harvard Health Letter* 22 (Dec. 1996): 4+.
- "Ulcerative Colitis: Manageable, With a Brighter Outlook." *Mayo Clinic Health Letter* 13 (Dec. 1995): 1+.

KEY TERMS

Endoscopy—A type of medical examination in which an instrument called an endoscope is passed into an area of the body (the bladder or intestine, for example). The endoscope usually has a fiberoptic camera, which allows a greatly magnified image to be projected onto a video screen, to be viewed by the operator. Many endoscopes also allow the operator to retrieve a small sample (biopsy) of the area being examined, in order to more closely view the tissue under a microscope.

Immune system—The system of the body that is responsible for producing various cells and chemicals that fight off infection by viruses, bacteria, fungi, and other foreign invaders. In autoimmune disease, these cells and chemicals are turned against the body itself.

Inflammation—The result of the body's attempts to fight off and wall off an area that is infected. Inflammation results in the classic signs of redness, heat, swelling, and loss of function.

ORGANIZATIONS

Crohn's and Colitis Foundation of America, Inc. 386 Park Avenue South, 17th Floor, New York, NY 10016-8804.
(800)932-2423.

Rosalyn Carson-DeWitt, MD

Ulcers (digestive)

Definition

In general, an ulcer is any eroded area of skin or a mucous membrane, marked by tissue disintegration. In common usage, however, ulcer is usually used to refer to disorders in the upper digestive tract. The terms ulcer, gastric ulcer, and peptic ulcer are often used loosely and interchangeably. Peptic ulcers can develop in the lower part of the esophagus, the stomach, the first part of the small intestine (the duodenum), and the second part of the small intestine (the jejunum).

Description

It is estimated that 2% of the adult population in the United States has active peptic ulcers, and that about

10% will develop ulcers at some point in their lives. There are about 500,000 new cases of peptic ulcer in the United States every year, with as many as 4 million recurrences. The male/female ratio for ulcers of the digestive tract is 3:1.

The most common forms of peptic ulcer are duodenal and gastric. About 80% of all ulcers in the digestive tract are duodenal ulcers. This type of ulcer may strike people in any age group but is most common in males between the ages of 20 and 45. The incidence of duodenal ulcers has dropped over the past 30 years. Gastric ulcers account for about 16% of peptic ulcers. They are most common in males between the ages of 55 and 70. The single most common cause of gastric ulcers is the use of **nonsteroidal anti-inflammatory drugs**, or NSAIDs. The widespread use of NSAIDs is thought to explain why the incidence of gastric ulcers in the United States is rising.

Causes and symptoms

Causes of peptic ulcers

There are three major causes of peptic ulcers: infection, certain types of medication, and disorders that cause oversecretion of stomach juices.

HELICOBACTER PYLORI INFECTION. *Helicobacter pylori* is a rod-shaped gram-negative bacterium that lives in the mucous tissues that line the digestive tract. Infection with *H. pylori* is the most common cause of duodenal ulcers. About 95% of patients with duodenal ulcers are infected with *H. pylori*, as opposed to only 70% of patients with gastric ulcers.

USE OF NONSTEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS). Nonsteroidal anti-inflammatory drugs, or NSAIDs, are painkillers that many people use for headaches, sore muscles, arthritis, menstrual cramps, and similar complaints. Many NSAIDs are available without prescriptions. Common NSAIDs include **aspirin**, ibuprofen (Advil, Motrin), flurbiprofen (Ansaid, Ocufen), ketoprofen (Orudis), and indomethacin (Indacin). Chronic NSAID users have 40 times the risk of developing a gastric ulcer as nonusers. Users are also three times more likely than nonusers to develop bleeding or fatal complications of ulcers. Aspirin is the NSAID that is most likely to cause ulcers.

MISCELLANEOUS SYNDROMES AND DISORDERS. Fewer than 5% of peptic ulcers are due to these disorders. They include Zollinger-Ellison syndrome, a disorder in which small tumors, called gastrinomas, secrete a hormone (gastrin) that stimulates the production of digestive juices. Because of this excess secretion, these disorders are sometimes called hypersecretory syndromes.

OTHER RISK FACTORS. **Smoking** is an important risk factor that increases a patient's chance of developing an ulcer, decreases the body's response to therapy, and increases the chances of dying from ulcer complications. Blood type appears to be a predisposing factor for ulcer location; people with type A blood are more likely to have gastric ulcers, while those with type O are more likely to develop duodenal ulcers. The role of emotional **stress** in ulcer development is currently debated. Present research indicates that an individual's attitudes toward stress, rather than the amount of stress by itself, is a better predictor of vulnerability to peptic ulcers. Preferences for high-fat or spicy foods do not appear to be significant risk factors.

Symptoms

GASTRIC ULCERS. The symptoms of gastric ulcers include feelings of **indigestion** and **heartburn**, weight loss, and repeated episodes of gastrointestinal bleeding. Ulcer **pain** is often described as gnawing, dull, aching, or resembling hunger pangs. The patient may be nauseated and suffer loss of appetite. About 30% of patients with gastric ulcers are awakened by pain at night. Many patients have periods of chronic ulcer pain alternating with symptom-free periods that last for several weeks or months. This characteristic is called periodicity.

DUODENAL ULCERS. The symptoms of duodenal ulcers include heartburn, stomach pain relieved by eating or **antacids**, weight gain, and a burning sensation at the back of the throat. The patient is most likely to feel discomfort two to four hours after meals, or after having citrus juice, coffee, or aspirin. About 50% of patients with duodenal ulcers awake during the night with pain, usually between midnight and 3 A.M. A regular pattern of ulcer pain associated with certain periods of day or night or a time interval after meals is called rhythmicity.

Not all digestive ulcers produce symptoms; as many as 20% of ulcer patients have so-called painless or silent ulcers. Silent ulcers occur most frequently in the elderly and in chronic NSAID users.

Complications

Between 10–20% of peptic ulcer patients develop complications at some time during the course of their illness. All of these are potentially serious conditions. Complications are not always preceded by diagnosis of or treatment for ulcers; as many as 60% of patients with complications have not had prior symptoms.

HEMORRHAGE. Bleeding is the most common complication of ulcers. It may result in anemia, vomiting blood (hematemesis), or the passage of bright red blood through the rectum (melena). About half of all cases of bleeding

from the upper digestive tract are caused by ulcers. The mortality rate from ulcer hemorrhage is 6–10%.

PERFORATION. About 5% of ulcer patients develop perforations, which are holes in the duodenal or gastric wall through which the stomach contents can leak out into the abdominal cavity. The incidence of perforation is rising because of the increased use of NSAIDs, particularly among the elderly. The signs of an ulcer perforation are severe pain, **fever**, and tenderness when the doctor touches the abdomen. Most cases of perforation require emergency surgery. The mortality rate is about 5%.

PENETRATION. Ulcer penetration is a complication in which the ulcer erodes through the intestinal wall without digestive fluid leaking into the abdomen. Instead, the ulcer penetrates into an adjoining organ, such as the pancreas or liver. The signs of penetration are more severe pain *without* rhythmicity or periodicity, and the spread of the pain to the lower back.

OBSTRUCTION. Obstruction of the stomach outlet occurs in about 2% of ulcer patients. It is caused by swelling or scar tissue formation that narrows the opening between the stomach and the duodenum (the pylorus). Over 90% of patients with obstruction have recurrent vomiting of partly digested or undigested food; 20% are seriously dehydrated. These patients also usually feel full after eating only a little food, and may lose weight.

Diagnosis

Physical examination and patient history

The diagnosis of peptic ulcers is rarely made on the basis of a **physical examination** alone. The only significant finding may be mild soreness in the area over the stomach when the doctor presses (palpates) it. The doctor is more likely to suspect an ulcer if the patient has one or more of the following risk factors:

- male sex
- age over 45
- recent weight loss, bleeding, recurrent vomiting, **jaundice**, back pain, or anemia
- history of using aspirin or other NSAIDs
- history of heavy smoking
- family history of ulcers or stomach cancer

Endoscopy and imaging studies

An endoscopy is considered the best procedure for diagnosing digestive ulcers and for taking samples of stomach tissue for biopsies. An endoscope is a slender tube-shaped instrument that allows the doctor to view the



A clinical photograph of a large duodenal ulcer after surgical removal. The ulcer is the prominent triangular crater at center. (Photo Researchers, Inc. Reproduced by permission.)

tissues lining the stomach and duodenum. Duodenal ulcers are rarely malignant. If the ulcer is in the stomach, however, the doctor will take a tissue sample because 3–5% of gastric ulcers are malignant. Radiological studies are sometimes used instead of endoscopy because they are less expensive, more comfortable for the patient, and are 85% accurate in detecting malignancies.

Laboratory tests

BLOOD TESTS. Blood tests usually give normal results in ulcer patients without complications. They are useful, however, in evaluating anemia from a bleeding ulcer or a high white cell count from perforation or penetration. Serum gastrin levels can be used to screen for Zollinger-Ellison syndrome.

TESTS FOR *HELICOBACTER PYLORI*. It is important to test for *H. pylori* because almost all ulcer patients who are not taking NSAIDs are infected. Noninvasive tests include blood tests for immune response and a breath test. In the breath test, the patient is given an oral dose of radiolabeled urea. If *H. pylori* is present, it will react with the urea and the patient will exhale radiolabeled carbon dioxide. Invasive tests for *H. pylori* include tissue biopsies and cultures performed from fluid obtained by endoscopy.

Treatment

Medications

Most drugs that are currently given to treat ulcers work either by lowering the rate of stomach acid secretion or by protecting the mucous tissues that line the digestive tract.

ANTISECRETORY DRUGS. Medications that lower the rate of stomach acid secretions fall into two major cate-



A barium x-ray image of a gastric ulcer. (Photograph by Bates, M.D., Custom Medical Stock Photo. Reproduced by permission.)

gories: proton pump inhibitors, which bind an enzyme that secretes stomach acid, and H₂ receptor antagonists, which work by reducing intracellular acid secretion. The proton pump inhibitors include omeprazole (Prilosec) and lansoprazole (Prevacid). The H₂ receptor antagonists include ranitidine (Zantac), cimetidine (Tagamet), famotidine (Pepcid), and nizatidine (Axid). Both types of drugs have few serious side effects and appear to be safe for long-term use.

PROTECTIVE DRUGS. The drugs that are currently used to protect the stomach tissues are sucralfate (Carafate), which forms a pastelike substance that clings to the mucous tissues and prevents further damage from stomach acid; and bismuth preparations. A third type of protective drug includes misoprostol (Cytotec), which is often given to patients with ulcers caused by NSAIDs.

Surgery

Surgical treatment of ulcers is generally used only for complications and suspected malignancies. The most common surgical procedures that are used are vagotomies, in which the connections of the vagus nerve to the stomach are cut in order to reduce acid secretion; and antrectomies, which involve the removal of a part of the stomach (the antrum).

Eradication of Helicobacter pylori

Most doctors presently recommend treatment to eliminate *H. pylori* in order to prevent ulcer recurrences. Without such treatment, ulcers recur at the rate of 80% per year. The usual regimen used to eliminate the bacterium is a combination of tetracycline, bismuth subsalicylate (Pepto-Bismol), and metronidazole (Metizol).

Alternative treatment

Alternative treatments can relieve symptoms and promote healing of ulcers. A primary goal of these

treatments is to rebalance the stomach's hydrochloric acid output and to enhance the mucosal lining of the stomach.

Food **allergies** have been pointed to as a major cause of peptic (stomach) ulcers. An elimination/challenge diet can help identify the allergenic food(s) and continued elimination of these foods can assist in healing the ulcer. People with ulcers should not take aspirin. They should also stop smoking, since smoking irritates the mucosal lining of the stomach. Antacids should be avoided by anyone with an ulcer, because they can cause a rebound effect of increasing gastric acid secretion, as well as deplete vital nutrients necessary for healing. **Stress reduction** is also important for ulcer sufferers.

Botanical medicine offers a variety of remedies that may be helpful in ulcer treatment. Deglycyrrhizinated licorice or DGL, in a chewable or powder form, can help heal the mucous membranes and increase mucus so that it mixes with saliva to protect the membranes. Raw cabbage juice, high in glutamic acid, is very effective in healing an ulcer (take 1 quart per day in divided doses). Soothing herbs, such as plantain (*Plantago major*), marsh mallow (*Althaea officinalis*), and slippery elm (*Ulmus fulva*); astringent herbs, such as geranium (*Pelargonium odoratissimum*); and the antimicrobial herb goldenseal (*Hydrastis canadensis*) can all be effective. Nutritionists advise taking antioxidant nutrients, including **vitamins A, C, and E**, zinc, and selenium.

Prognosis

The prognosis for recovery from ulcers is good for most patients. Very few ulcers fail to respond to the medications that are currently used to treat them. Recurrences can be cut to 5% by eradication of *H. pylori*. Most patients who develop complications recover without problems even when emergency surgery is necessary.

Prevention

Strategies for the prevention of ulcers or their recurrence include the following:

- eradication of *H. pylori* in patients already diagnosed with ulcers
- giving misoprostol to patients who must take NSAIDs
- avoiding unnecessary use of aspirin and NSAIDs
- giving up smoking
- cutting down on alcohol, tea, coffee, and sodas containing caffeine

KEY TERMS

Duodenum—The first of the three segments of the small intestine. The duodenum connects the stomach and the jejunum. Most peptic ulcers are in the duodenum.

Helicobacter pylori—A gram-negative rod-shaped bacterium that lives in the tissues of the stomach and causes inflammation of the stomach lining.

Zollinger-Ellison syndrome—A disorder characterized by the presence of tumors (gastrinomas) that secrete a hormone (gastrin), which stimulates the production of digestive juices.

Resources

BOOKS

- McQuaid, Kenneth R. "Alimentary Tract." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.
- Miller, David K. "Chronic Abdominal Pain." In *Current Diagnosis*. Vol. 9. Ed. Rex B. Conn, et al. Philadelphia: W. B. Saunders Co., 1997.
- "Peptic Ulcers." In *Professional Guide to Diseases*, ed. Stanley Loeb, et al. Springhouse, PA: Springhouse Corporation, 1991.
- Viggiano, Thomas R. "Peptic Ulcer Disease." In *Current Diagnosis*. Vol. 9. Ed. Rex B. Conn, et al. Philadelphia: W. B. Saunders Co., 1997.
- "Stomach and Duodenum." In *Current Surgical Diagnosis and Treatment*. 10th ed. Ed. Lawrence W. Way. Stamford: Appleton & Lange, 1994.

ORGANIZATIONS

- American College of Gastroenterology. 4900-B South Thirty-First St., Arlington, VA 22206-1656. (703) 820-7400.
[<http://www.acg.cgi.org/acghome/html>](http://www.acg.cgi.org/acghome/html).
- Digestive Health Initiative. 7910 Woodmont Ave., #914, Bethesda, MD 20814. (800) 668-5237. <<http://www.gastro.org/dhi.html>>.

Rebecca J. Frey

Ultrasonic lithotripsy see **Lithotripsy**

Ultraviolet light treatment

Definition

Ultraviolet light treatment uses a particular band of the nonvisible light spectrum to treat **psoriasis** and a

variety of other skin diseases. It can be used alone or in combination with other medications applied directly to the skin or taken internally.

Purpose

Ultraviolet (UV) light treatment is used primarily in cases of severe psoriasis that have not responded to other medications or in cases affecting large portions of the body. Patients will typically receive a series of 3–5 weekly treatments for a month or more to bring their psoriasis symptoms into check. They may also receive periodic maintenance treatments to prevent recurrence of their psoriasis. Other skin conditions treated with UV light treatments are **vitiligo**, a condition in which people lose pigmentation in large patches of their skin, and **atopic dermatitis**, an allergy-related skin condition that produces itchy, reddish, and scaly patches of skin.

Precautions

Exposure to UV radiation is known to prematurely age the skin over time and increase the risk of skin **cancer**. These potential effects should be weighed against the potential benefits of the treatment. A history will be taken regarding sun exposure and burning, medications, such as **diuretics**, that may increase UV sensitivity exposure, and any history of skin cancers. Sometimes, UV light treatments are given in combination with photosensitizing agents, which maximize UV's effects on the skin. Patients who receive these agents, called **psoralens**, must take care to avoid exposure to sunlight, which also contains UV radiation. Exposure to UV radiation can also cause **cataracts** and other eye damage, so the patient's eyes must be adequately shielded during the treatments.

Description

UV light treatment can employ one of two bands of the ultraviolet spectrum: ultraviolet A (UVA), and ultraviolet B (UVB). Patients receive full body treatments in special light boxes; smaller areas of the skin are sometimes treated with hand-held devices.

UVB treatment

Psoriasis is the most common skin disease treated with UVB light treatment. Its mechanism of action remains unclear, but investigators speculate it may kill abnormal skin cells or alter immune system reactions in the skin. Most patients require 18–30 treatments before substantial improvement or complete clearing is seen. The intensity of the UV applied will vary depending on the patient's skin type. Fair-skinned patients will start with a relatively weaker dose; dark-skinned patients, a

stronger dose. Physicians will first expose a small area of skin to UVB to determine the minimum erythema dose (MED), the minimum amount of UVB that produces redness 24 hours after exposure. Patients will be exposed for short times early in the treatment cycle, but these times will gradually increase over time.

The Goeckerman regimen, a treatment that combines UVB light with coal tar applied to the skin, is among the oldest and most frequently used treatments for patients with moderate to severe psoriasis. The coal tar is a photosensitizing agent, and, when it interacts with UVB, it appears to limit the abnormal turnover of skin cells characteristic of psoriasis. Although treatments with UVB and coal tar are highly effective, many patients dislike the smell. Some investigators believe use of petroleum jelly or other emollients are just as effective as the coal tar preparations.

In addition to their UVB treatments, many patients will receive systemic agents such as methotrexate, a drug used in severe case of psoriasis, and certain vitamin A derivatives called retinoids.

PUVA treatment

Psoralens are photosensitizing agents found in plants. They have been known since ancient Egypt but have only been available in a chemically synthesized form since the 1970s. Psoralens are taken systemically or can be applied directly to the skin. The psoralens allow a relatively lower dose of UVA to be used. When they are combined with exposure to UVA in PUVA, they are highly effective at clearing psoriasis. Like UVB light treatments, the reason remains unclear, though investigators speculate there may be similar effects on cell turnover and the skin's immune response.

Choosing the proper dose for PUVA is similar to the procedure followed with UVB. The physician can choose a dose based on the patient's skin type. Often, however, a small area of the patient's skin will be exposed to UVA after ingestion of psoralen. The dose of UVA that produces uniform redness 72 hours later, called the minimum photo-toxic dose (MPD), becomes the starting dose for treatment.

Some patients experience nausea and **itching** after ingesting the psoralen compound. For these patients "bath PUVA" may be a good option.

Preparation

No major preparation is required for UV light treatments. Areas of the skin that are especially sensitive to the effects of UV light, such as the groin, backside, or face, are shielded during the treatments. Areas not affected by psoriasis are also covered. Special goggles are

worn to protect the eyes. Some physicians apply an emollient, such as petroleum jelly, to the skin or other topical agents, such as coal tar, to enhance the results. In PUVA treatments, the psoralen is usually taken one hour before the treatment.

Aftercare

No major aftercare is required following UV light treatments. Patients, however, must take great care to limit or eliminate other exposures to UV radiation, such as from sunlight or tanning beds, because of the increased risk of premature **aging** of the skin and the development of skin cancers. Patients should monitor their skin closely for any signs of precancerous or cancerous skin growths in the future.

Risks

People who receive UV light treatments are at higher risk of premature aging of the skin, and of developing skin cancer. These risks should be balanced against the benefits of treatment. Patients must also take care to limit or eliminate their exposure to other sources of UV radiation, especially if they are taking a psoralen compound in addition to receiving the UV treatments.

Normal results

Psoriasis will normally show significant improvement to complete healing with three to five UVB treatments a week for about four to five weeks. PUVA treatments may require a bit longer to take effect, but because the overall dosage of UV is lower, they are thought by some investigators to be a safer alternative to UVB treatments.

Abnormal results

Modern light boxes carefully control the dosage of UV radiation and the exposure time. Overdose or overexposure is possible, however, and can lead to severe **burns**. It is important to choose a treatment provider who is experienced in the technique. It is also important to tell the physician about all medications being taken by the patient. Some medications, either alone or in combination with a psoralen, can provoke an extreme reaction to UV radiation.

Resources

BOOKS

- Dover, Jeffrey S. "Phototherapy." In *Manual of Clinical Problems in Dermatology*, ed. Susan M. Olbricht, et al. Boston: Little, Brown and Co., 1992.
- Lynch, Peter J., and W. Mitchell Sams Jr. *Principles and Practice of Dermatology*. 2nd ed. New York: Churchill Livingstone, 1996.

KEY TERMS

Goeckerman regimen—UVB light therapy combined with topical coal-tar preparations.

Minimum erythema dose—The minimum amount of UVB that produces redness 24 hours after exposure. It is the starting dose for UVB light treatments.

Minimum phototoxic dose—The dose of UVA that produces uniform redness 72 hours after ingesting a psoralen compound. It becomes the starting dose for PUVA treatment.

Psoralen—A family of photosensitizing chemicals that can be found in lemons, celery, and other plants. Chemically synthesized versions are used to augment the effects of UVA light treatments.

PUVA treatments—Treatments with the photosensitizers called psoralens and UVA.

Ultraviolet light—A portion of the light spectrum not visible to the eye. Two bands of the UV spectrum, UVA and UVB, are used to treat psoriasis and other skin diseases.

PERIODICALS

- Lowe, Nicholas J. "Photo(chemo)therapy: General Principles." *Clinics in Dermatology* 15 (Sept./Oct. 1997): 745-752.
 Nee, Tham Siew. "Phototherapy." *Clinics in Dermatology* 15 (Sept./Oct. 1997): 753-767.

ORGANIZATIONS

- American Academy of Dermatology. 930 N. Meacham Road, P.O. Box 4014, Schaumburg, IL 60168-4014. (847) 330-0230. <<http://www.aad.org>>.
 National Psoriasis Foundation. 6600 SW 92nd Ave., Suite 300, Portland OR 97223-7195. (503) 244-7404. <<http://www.psoriasis.org>>.

Richard H. Camer

Uncinariasis see **Hookworm disease**

Undescended testes

Definition

Also known as cryptorchidism, undescended testes is a congenital condition characterized by testicles that do not extend to the scrotum.

Description

In the fetus, the testes are in the abdomen. As development progresses they migrate downward through the groin and into the scrotum. This event takes place late in fetal development, during the eighth month of gestation. Thirty percent of premature boys have testes that have not yet made the full descent. Only 3–4% of full-term baby boys have undescended testes, and half of those complete the journey by the age of three months. Eighty percent of all undescended testes cases naturally correct themselves during the first year of life. Undescended testes that are not corrected can lead to sterility and an increased risk of **testicular cancer**.

Causes and symptoms

The cause of undescended testes is presently unknown, however its symptoms are quite apparent. One or all of the testicles can be undescended, therefore the testicles appear to be either missing or lopsided.

Diagnosis

The newborn examination always checks for testes in the scrotum. If they are not found, a search will be conducted, but not necessarily right away. In most cases, the testes will drop into place later. If the testes are present at all, they can be anywhere within a couple inches of the appropriate spot. In 5% of cases, one testis is completely absent. In 10%, the condition occurs on both sides. Presence of undescended testes is indicated by measuring the amount of gonadotropin hormone in the blood.

Treatment

Once it is determined that the testes will not naturally descend, surgery becomes necessary. The procedure is called an orchiopexy and is relatively simple once the testes are located. The surgery is usually performed when the boy is between one to two years old.

Prognosis

Undescended testes must be treated to eliminate the increased risk of testicular **cancer** and the possibility of sterility. Undescended testes are twice as likely to develop cancer. Ten percent of all testicular cancers are in undescended testes.

Resources

BOOKS

- Bennett, J. Claude, and Fred Plum, eds. *Cecil Textbook of Medicine*. Philadelphia: W. B. Saunders Co., 1996.

KEY TERMS

Cryptorchidism—Undescended testes.

Embryonic—Early stages of life in the womb.

Fetal—Refers to the fetus, also known in the first two months after conception as an embryo.

Orchiopexy—Surgical procedure that places the testicles in the scrotum.

Nelson Textbook of Pediatrics. Ed. Richard E. Behrman.

Philadelphia: W. B. Saunders Co., 1996.

Rajfer, Jacob. "Congenital Anomalies of the Testes and Scrotum." In *Campbell's Urology*, ed. Patrick C. Walsh, et al. Philadelphia: W. B. Saunders Co., 1998.

Rozauski, Thomas, et al. "Surgery of the Scrotum and Testis in Children." In *Campbell's Urology*, ed. Patrick C. Walsh, et al. Philadelphia: W. B. Saunders Co., 1998.

J. Ricker Polsdorfer, MD

Undulant fever see **Brucellosis**

Unipolar depression see **Depressive disorders**

Upper GI exam

Definition

An upper GI examination is a fluoroscopic examination (a type of x-ray imaging) of the upper gastrointestinal tract, including the esophagus, stomach, and upper small intestine (duodenum).

Purpose

An upper GI series is frequently requested when a patient experiences unexplained symptoms of abdominal pain, difficulty in swallowing (dysphagia), regurgitation, diarrhea, or weight loss. It is used to help diagnose disorders and diseases of, or related to, the upper gastrointestinal tract, including cases of hiatal hernia, diverticuli, ulcers, tumors, obstruction, enteritis, gastroesophageal reflux disease, Crohn's disease, and pulmonary aspiration.

Precautions

Because of the risks of radiation exposure to the fetus, pregnant women are advised to avoid this procedure. Patients with an obstruction or perforation in their

bowel should not ingest barium (a radioactive substance used to show contrast in the images) for an upper GI, but may still be able to undergo the procedure if a water-soluble contrast medium is substituted for the barium.

Glucagon, a medication sometimes given prior to an upper GI procedure, may cause nausea and **dizziness**.

Description

An upper GI series takes place in a hospital or clinic setting and is performed by an x-ray technician and a radiologist. A radiologist typically is in attendance to oversee the procedure, and view and interpret the fluoroscopic pictures. Before the test begins, the patient is sometimes administered an injection of glucagon, a medication which slows stomach and bowel activity, to allow the radiologist to get a clearer picture of the gastrointestinal tract. In order to further improve the clarity of the upper GI pictures, the patient may be given a cup of baking soda crystals to swallow, which distend the stomach by producing gas.

Once these preparatory steps are complete, the patient stands against an upright x-ray table, and a fluoroscopic screen is placed in front of him. The patient will be asked to drink from a cup of flavored barium sulfate, a thick and chalky-tasting liquid that allows the radiologist to see the digestive tract, while the radiologist views the esophagus, stomach, and duodenum on the fluoroscopic screen. The patient will be asked to change positions frequently in order to coat the entire surface of the gastrointestinal tract with barium. The technician or radiologist may press on the patient's abdomen in order to spread the barium. The x-ray table will also be moved several times throughout the procedure. The radiologist will ask the patient to hold his breath periodically while exposures are being taken. The entire procedure takes approximately 30 minutes.

In some cases, in addition to the standard upper GI series, a doctor may request a detailed intestine, or small bowel, radiography and fluoroscopy series; it is also called a small bowel follow-through (SBFT). Once the preliminary upper GI series is complete, the patient will be escorted to a waiting area while the barium travels down through the rest of the small intestinal path. Every 15–30 minutes, the patient will return to the x-ray suite for additional x rays, or films. Once the barium has completed its trip down the small bowel tract, the test is completed. This procedure can take anywhere from one to four hours.

Esophageal radiography, also called a barium esophagram or a barium swallow, is a study of the esophagus only, and is usually performed as part of the upper

GI series. It is commonly used to diagnose the cause of difficulty in swallowing (dysphagia) and for detecting hiatal hernia. A barium sulfate liquid, and sometimes pieces of food covered in barium, are given to the patient to drink and eat while a radiologist examines the swallowing mechanism on a fluoroscopic screen. The test takes approximately 30 minutes.

Preparation

Patients must not eat, drink, or smoke for eight hours prior to undergoing an upper GI examination. Longer dietary restrictions may be required, depending on the type and diagnostic purpose of the test. Patients undergoing a small bowel follow-through exam may be asked to take **laxatives** the day prior to the test. Upper GI patients are typically required to wear a hospital gown, or similar attire, and to remove all jewelry, so the camera has an unobstructed view of the abdomen.

Aftercare

No special aftercare treatment or regimen is required for an upper GI series. The patient may eat and drink as soon as the test is completed. The barium sulfate may make the patient's stool white for several days, and patients are encouraged to drink plenty of fluids in order to eliminate it from their system.

Risks

Because the upper GI series is an x-ray procedure, it does involve minor exposure to ionizing radiation. Unless the patient is pregnant, or multiple radiological or fluoroscopic studies are required, the small dose of radiation incurred during a single procedure poses little risk. However, multiple studies requiring fluoroscopic exposure that are conducted in a short time period have been known, on rare occasions, to cause skin **death** (necrosis) in some individuals. This risk can be minimized by careful monitoring and documentation of cumulative radiation doses administered to these patients.

Normal results

A normal upper GI series will show a healthy, functioning, and unobstructed digestive tract.

Abnormal results

Obstructions or inflammation, including ulcers of the esophagus, stomach, or small intestine; or irregularities in the swallowing mechanism are just a few of the possible abnormalities that may show up on an upper GI series.

Resources

BOOKS

Ross, Linda, ed. *Gastrointestinal Diseases and Disorders Sourcebook*. Vol. 16. Detroit: Omnigraphics, Inc., 1996.

PERIODICALS

Newman, J. "Radiographic and Endoscopic Evaluation of the Upper GI Tract." *Radiology Technology* 69,no. 3 (Jan./Feb. 1998): 213-26.

Urea clearance by the kidneys see **Kidney function tests**

Ureteral stenting

Definition

Ureteral stents are thin catheters threaded into segments of the ureter that carry urine, produced by the kidney, either down into the bladder internally, or to an external collection system. Insertion is most often done through the skin (percutaneously); however, in the presence of kidney or ureteral stones, stenting is ideally done during **cystoscopy**.

Purpose

Ureteral stenting may be placed on a long-term basis (months to years) in order to bypass ureteral obstruction. Short-term stenting (weeks to months) may be used as an adjunct to open surgical procedures of the urinary tract to provide a mold around which healing can occur, or to divert the urinary flow away from areas of leakage. Following balloon dilation or incision of ureteral strictures, placement of stents maintains the functionality of the ureters. Stents may also be used in the presence of **kidney stones** to manipulate or prevent stone migration prior to treatment, or to make the ureters more easily identifiable during difficult surgical procedures. Ureteral stents may be used in those with active kidney infection or with markedly diseased, intolerant bladders (e.g., damage from **radiation therapy**, bladder invasion by adjacent neoplasm).

Preparation

The procedure should be thoroughly explained by a medical professional before it takes place. The patient will be asked to put on a hospital gown. If the procedure is performed with the aid of a cytoscope, the patient will assume a position that is typically used in a gynecological exam.

KEY TERMS

Cystoscopy—Examination or treatment of the interior of the urinary bladder by looking through a special instrument with reflected light.

Stricture—An abnormal narrowing of a tube or passageway.

Ureter—The tube-like passageway in the body that carries urine from the kidney to the bladder.

Aftercare

Stents must be periodically replaced to prevent **fractures** within the catheter wall, or buildup of encrustation. Stent replacement is recommended approximately every six months or more often in patients who form stones.

Normal results

Normally, a ureteral stent assures the patient of a free flow of urine. Postoperatively, urine flow will be monitored to ensure the stent has not been dislodged or obstructed.

Abnormal results

Serious complications of the procedure occur in approximately four percent of cases, with minor complications in another 10%. These may include:

- Bleeding. Usually minor and easily treated, occasionally requiring **transfusion**.
- Catheter migration or dislodgement. May require readjustment with the fluoroscope in the Radiology Department.
- Coiling of the stent within the ureter. May cause lower abdominal **pain** or flank pain on urination, urinary frequency, or blood in the urine.
- Introduction or worsening of infection.
- Penetration of adjacent organs (e.g., bowel, gallbladder, or lungs).

Resources

BOOKS

Hanno, Philip, and Alan Wein. *Clinical Manual of Urology*.

Philadelphia: McGraw Hill, Inc., 1994.

Lerner, Judith. *Mosby's Manual Of Urologic Nursing*. St.

Louis: C. V. Mosby Co., 1982.

Schrier, Robert, and Carl Gottschalk. *Diseases of the Kidney*.

Philadelphia: Little, Brown and Co., 1997.

Kathleen D. Wright, RN

Ureterostomy see **Urinary diversion surgery**
Urethra defects see **Hypospadias and epispadias**

Urethritis

Definition

Urethritis is an inflammation of the urethra that is usually caused by an infection.

Description

The urethra is the canal that moves urine from the bladder to the outside of the body. When this canal becomes infected, inflammation occurs due to the accumulation of white blood cells in the area. When this occurs, it is called urethritis. Besides the urethra, the urinary tract consists of the bladder, ureters, and kidneys. Inflammation can move up the urethra, causing **cystitis** in the bladder, or **nephritis** in the kidneys. Collectively, these inflammations are called urinary tract infections or UTIs.

Urinary tract infections are much more common in women than in men, probably due to anatomy. Infections are especially more common in older women, due to bladder problems.

Causes and symptoms

Uncomplicated urethritis usually results from infection by the bacteria *Escherichia coli*, commonly found in the bowel. Complicated urethritis can occur when other problems exist, such as **kidney stones**, malformations of the urinary tract, **spinal cord injury**, or a compromised immune system. People with diabetes tend to have more urinary tract infections, as well as hospitalized patients. Urinary tract infections can also be sexually transmitted. Some people seem to be susceptible to urinary tract infections, having them recurrently.

Frequently, a urinary tract infection has no symptoms. Common symptoms though, include **pain** and a burning sensation when urinating, frequent urination, or passing blood in the urine. Signs that the infection may be worsening include **fever** and chills, nausea, vomiting, and lower back pain.

Diagnosis

The diagnosis for a urinary tract infection is made by assessing the symptoms, feeling (palpating) the abdomen

for tenderness, and a **urinalysis**. A urinalysis, or urine sample, is examined for both the presence of bacteria and white blood cells. After this, a **urine culture** to determine what bacteria is causing the infection may be done.

Treatment

Typical treatment for urinary tract infections is a course of **antibiotics**. In women who have recurrent urethritis, the diagnosis and treatment is often resolved over the phone. Additional drugs are sometimes given to relieve discomfort.

Alternative treatment

For those individuals who seem to be more susceptible to urinary tract infections, drinking lots of fluids at the first sign of an infection can ward it off by diluting the bacteria present and flushing the system. Adding a tea-spoon of baking soda to a glass of water and drinking it can change the pH of the urine, causing it to burn less. Also, cranberry juice contains a compound that can prevent bacteria from sticking to and thus growing in the urinary tract. Antimicrobial herbs, such as uva ursi (*Arcostaphylos uva-ursi*) and pipsissewa (*Chimaphila umbellata*), may be helpful. Other herbs, such as marsh mallow (*Althaea officinalis*), slippery elm (*Ulmus fulva*), comfrey (*Symphytum officinale*), plantain (*Plantago major*), and cornsilk, can soothe the urinary tract. *Lactobacillus acidophilus* and *L. bifidus* supplementation reintroduces normal flora into the urinary tract. **Acupuncture** and **homeopathy** can also be effective therapies for urethritis.

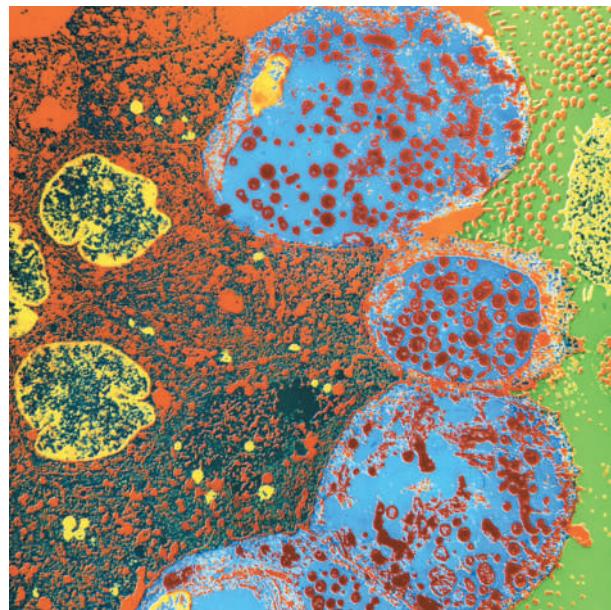
Prognosis

Given the appropriate antibiotic, urinary tract infections usually go away quickly. If not treated soon enough, however, urethritis can move up the urinary tract, infecting the bladder and possibly the kidneys, resulting in kidney damage. If the infection moves into the blood, additional complications can arise. Those who have previously had a urinary tract infection are more susceptible to additional urinary tract infections. Because of this, patients need to be aware of the symptoms so that a physician can be notified if the infection becomes recurrent.

Prevention

There are some steps that can be taken to keep the urinary tract healthy and prevent infection.

- drink plenty of fluids;
- do not hold urine once the urge to urinate has occurred;
- after a bowel movement, wipe from front to rear to keep bowel bacteria at a distance;



A false color transmission electron micrograph (TEM) scan of non-specific urethritis. (Photograph by Dr. R. Dourmashkin, Custom Medical Stock Photo. Reproduced by permission.)

- wear cotton underwear
- rinse soap off well in the shower
- urinate after sexual intercourse
- for post-menopausal women, estrogen replacement therapy can help prevent urinary tract infection

Resources

BOOKS

Harrison's Principles of Internal Medicine. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

The Merck Manual of Diagnosis and Therapy. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

PERIODICALS

"Drink Away Urinary Tract Infections." *Prevention Magazine*, Jan. 1998, 135.

Cindy L. A. Jones, PhD

Uric acid tests

Definition

Uric acid tests are tests that are done to measure the levels of uric acid in blood serum or in urine.

Purpose

The uric acid tests are used to evaluate the blood levels of uric acid for **gout** and to assess uric acid levels in the urine for kidney stone formation. The urine test is used most often to monitor patients already diagnosed with **kidney stones**, but it can also be used to detect disorders that affect the body's production of uric acid and to help measure the level of kidney functioning.

Uric acid is a waste product that results from the breakdown of purine, a nucleic acid. (Nucleic acids are the building blocks of DNA.) Uric acid is made in the liver and excreted by the kidneys. If the liver produces too much uric acid or the kidneys excrete too little, the patient will have too much uric acid in the blood. This condition is called hyperuricemia. Supersaturated uric acid in the urine (uricosuria) can crystallize to form kidney stones that may block the tubes that lead from the kidneys to the bladder (the ureters).

Precautions

Blood test

Patients scheduled for a blood test for uric acid should be checked for the following medications: loop **diuretics** (Diamox, Bumex, Edecrin, or Lasix); ethambutol (Myambutol); vincristine (Oncovin); pyrazinamide (Tebrazid); thiazide diuretics (Naturetin, Hydrex, Diuril, Esidrix, HydroDiuril, Aquatensen, Renese, Diurese); **aspirin** (low doses); **acetaminophen** (Tylenol); ascorbic acid (vitamin C preparations); levodopa (Larodopa); or phenacetin. These drugs can affect test results.

Certain foods that are high in purine may increase the patient's levels of uric acid. These include kidneys, liver, sweetbreads, sardines, anchovies, and meat extracts.

Urine test

Patients should be checked for the following medications before the urine test: diuretics, aspirin, pyrazinamide (Tebrazid), phenylbutazone, probenecid (Bene-mid), and allopurinol (Lopurin). If the patient needs to continue taking these medications, the laboratory should be notified.

The laboratory should also be notified if the patient has had recent x-ray tests requiring contrast dyes. These chemicals increase uric acid levels in urine and decrease them in blood.

Description

The uric acid blood test is performed on a sample of the patient's blood, withdrawn from a vein into a vacuum

tube. The procedure, which is called a venipuncture, takes about five minutes. The urine test requires the patient to collect all urine voided over a 24-hour period, with the exception of the very first specimen. The patient keeps the specimen container on ice or in the refrigerator during the collection period.

Preparation

The uric acid test requires either a blood or urine sample. For the blood sample, the patient should be **fasting** (nothing to eat or drink) for at least eight hours before the test. The urine test for uric acid requires a 24-hour urine collection. The urine test does *not* require the patient to fast or cut down on fluids. Some laboratories encourage patients to drink plenty of fluids during the collection period.

Risks

Risks for the blood test are minimal, but may include slight bleeding from the puncture site, a small bruise or swelling in the area, or **fainting** or feeling light-headed.

Normal results

Blood test

Reference values for blood uric acid vary from laboratory to laboratory but are generally found within the following range: Male: 2.1–8.5 mg/dL; female: 2.0–6.6 mg/dL. Values may be slightly higher in the elderly.

Urine test

Reference values for 24-hour urinary uric acid vary from laboratory to laboratory but are generally found within the following range: 250–750 mg/24 hours.

Abnormal results

The critical value for the blood test is a level of uric acid higher than 12 milligrams per deciliter (about 3.4 ounces).

Increased *production* of uric acid may result from eating foods that are high in purine. Increased uric acid levels due to overproduction may also be caused by gout, by a genetic disorder of purine metabolism, or by metastatic **cancer**, destruction of red blood cells, leukemia, or cancer **chemotherapy**.

Decreased *excretion* of uric acid is seen in chronic kidney disease, low thyroid, toxemia of **pregnancy**, and **alcoholism**. Patients with gout excrete less than half the uric acid in their blood as other persons. Only 10–15% of the total cases of hyperuricemia, however, are caused by gout.

KEY TERMS

Fanconi's syndrome—A rare disorder caused by vitamin D deficiency or exposure to heavy metals.

Gout—A metabolic disorder characterized by sudden recurring attacks of arthritis caused by deposits of crystals that build up in the joints due to abnormally high uric acid blood levels. In gout, uric acid may be overproduced, underexcreted, or both.

Hyperuricemia—Excessively high levels of uric acid in the blood, often producing gout.

Purine—A white crystalline substance that is one of the building blocks of DNA. Uric acid is produced when purine is broken down in the body.

Uric acid—A compound resulting from the body's breakdown of purine. It is normally present in human urine only in small amounts.

Uricosuria—Increased levels of uric acid in the urine.

Wilson's disease—A rare hereditary disease marked by the buildup of copper in the liver and brain, causing loss of kidney function.

Abnormally low uric acid levels may indicate that the patient is taking allopurinol or probenecid for treatment of gout; may be pregnant; or suffers from Wilson's disease or **Fanconi's syndrome**.

Resources

BOOKS

Jacobs, David S., et al. *Laboratory Test Handbook*. 4th ed. New York: Lexi-Comp Inc., 1996.

Pagana, Kathleen Deska. *Mosby's Manual of Diagnostic and Laboratory Tests*. St. Louis: Mosby, Inc., 1998.

Cahill, Mathew. *Handbook of Diagnostic Tests*. Springhouse, PA: Springhouse Corporation, 1995.

Janis O. Flores

Urinalysis

Definition

Urinalysis is a diagnostic physical, chemical, and microscopic examination of a urine sample (specimen). Specimens can be obtained by normal emptying of the

bladder (voiding) or by a hospital procedure called catheterization.

Purpose

Urinalyses are performed for several reasons:

- general evaluation of health
- diagnosis of metabolic or systemic diseases that affect kidney function
- diagnosis of endocrine disorders. Twenty-four-hour urine studies are often ordered for these tests
- diagnosis of diseases or disorders of the kidneys or urinary tract
- monitoring of patients with diabetes
- testing for **pregnancy**
- screening for drug abuse

Precautions

Voided specimens

Urinalysis should not be performed while a woman is menstruating or having a vaginal discharge. A woman who must have a urinalysis while she has a vaginal discharge or is having her period should insert a fresh tampon before beginning the test. She should also hold a piece of clean material over the entrance to her vagina to avoid contaminating the specimen.

Patients do not have to fast or change their food intake before a urine test. They should, however, avoid intense athletic training or heavy physical work before the test because it may result in small amounts of blood in the urine.

The following drugs can affect urinalysis results. The patient may be asked to stop taking them until after the test:

- Nitrofurantoin (Macrodantin, Furadantin). Nitrofurantoin is prescribed for infections of the urinary tract and other bacterial infections.
- Phenazopyridine (Pyridium). This medication is used to relieve burning and **pain** caused by urinary-tract infections.
- Rifampin (Rifadin). This medication is prescribed to treat **tuberculosis**, prevent the spread of **meningitis**, and treat other infections.

Bladder catheterization

Bladder catheterization is sometimes used to collect urine samples from hospitalized patients. It should not, however, be used to collect specimens from males with

acute inflammation of the prostate or from a patient of either sex with a fractured pelvis.

Description

Collecting a urine sample from emptying the bladder takes about two or three minutes. The sample can be collected at home as well as in a doctor's office. Urine specimens are usually collected early in the morning before breakfast. Urine collected eight hours after eating and at least six hours after the most recent urination is more likely to indicate abnormalities. Some people may be asked to void into a clean container before getting out of bed in the morning.

Specimen containers

The doctor or hospital will supply a sterile container for a specimen being collected for a colony count. A colony count is a test that detects bacteria in urine that has been cultured for 24–48 hours. It is used instead of a routine urinalysis when a patient's symptoms suggest a urinary tract infection. Nonsterile containers can be used for routine specimens that will not be tested immediately after being collected. An ordinary open-necked jar may be used after it and its lid have been soaked in very hot water for 15–20 minutes and then air-dried.

Laboratory procedures

STORAGE. Urine specimens should not remain unrefrigerated for longer than two hours. A urine specimen that cannot be delivered to a laboratory within two hours should be stored in a refrigerator. The reason for this precaution is that urine samples undergo chemical changes at room temperature. Blood cells begin to dissolve and the urine loses its acidity.

VISUAL EXAMINATION. A doctor, nurse, or laboratory technician will look at the specimen to see if the urine is red, cloudy, or looks unusual in any way. He or she will also note any unusual odor.

TESTING TECHNIQUES. Urine samples are tested with a variety of different instruments and techniques. Some tests use dipsticks, which are thin strips of plastic that change color in the presence of specific substances. Dipsticks can be used to measure the acidity of the urine (its pH) or the presence of blood, protein, sugar, or substances produced during the breakdown of fatty acids (ketones). A urinometer is used to compare the density of the urine specimen with the density of plain water. This measurement is called specific gravity.

The urine specimen is also examined under a microscope to determine whether it contains blood cells, crystals, or small pieces of fibrous material (casts).

Preparation

Voided specimens

Most urine specimens from adults or older children are collected by the patient's voiding into a suitable container. Soaps and disinfectants may contaminate urine specimens and should not be used. The doctor or laboratory may supply a special antiseptic solution that won't irritate the skin. The method for collection varies somewhat according to age and sex.

WOMEN AND GIRLS. Before collecting a urine sample, a woman or girl should use a clean cotton ball moistened with lukewarm water to cleanse the external genital area. Gently separating the folded skin (labia) on either side of her vagina, she should move the cotton ball from the front of the area to the back. After repeating this process several times, using a fresh piece of cotton each time, she should dry the area with a clean towel.

To prevent menstrual blood, vaginal discharge, or germs from the external genitalia from contaminating the specimen, a woman or girl should release some urine before she begins to collect her sample. A urine specimen obtained this way is called a midstream clean catch.

MEN AND BOYS. A man or boy should use a piece of clean cotton, moistened with antiseptic, to cleanse the head of his penis and the passage through which urine leaves his body (the urethral meatus). He should draw back his foreskin if he has not been circumcised. He should move the cotton in a circular motion away from the urinary opening, using a fresh piece of cotton each time. After repeating this process several times, he should use a fresh piece of cotton to remove the antiseptic. After the area has been thoroughly cleansed, he should begin urinating and collect a small sample in a container without interrupting the stream of urine.

INFANTS. A parent, nurse, or doctor should cleanse the child's genitals and as much of the surrounding area as will fit into the sterile urine-collection bag provided by the hospital. When the area has been thoroughly cleansed, the bag should be attached to the child's genital area and left in place until the child has urinated. It is important to remember not to touch the inside of the bag and to remove it as soon as a specimen has been obtained.

Bladder catheterization

Bladder catheterization is a hospital procedure used to collect uncontaminated urine when the patient cannot void. A catheter is a thin flexible tube that the doctor inserts through the urethra into the bladder to

allow urine to flow out. To minimize the risk of infecting the patient's bladder with bacteria, many doctors use a so-called Robinson catheter, which is a plain rubber or latex tube that is removed as soon as the specimen is collected.

Suprapubic bladder aspiration is a technique that is sometimes used to collect urine from infants younger than six months. The doctor withdraws urine from the bladder into a syringe through a needle inserted through the skin over the bladder. This technique is used only when the child cannot void because of an abnormal urethra or if he or she has a urinary tract infection that has not responded to treatment.

Aftercare

The patient may return to normal activities after collecting the sample and may start taking medications that were discontinued before the test.

Risks

There are no risks associated with voided specimens. The risk of bladder infection from catheterization with a Robinson catheter is about 3%.

Normal results

Contents and appearance

Normal urine is a clear straw-colored liquid. It has a slight odor. It contains some crystals, a small number of cells from the tissues that line the bladder, and transparent (hyaline) casts. Normal urine does *not* contain sugars, yeast cells, protein, ketones, bacteria, or parasitic organisms.

The time of day a urine sample is collected can make a difference in the appearance of the specimen. Some foods and medicines, including red beets, asparagus, and penicillin, can affect the color or smell of urine. Although most color variations are harmless, they sometimes indicate the presence of serious disease. A doctor, nurse, or laboratory technician should be notified if the urine is red or cloudy or looks unusual in any way.

Acidity

The pH of normal urine is 4.5–8.0. Its specific gravity is 1.0005–1.035.

Abnormal results

Cloudiness

Urine may be cloudy (turbid) because it contains red or white blood cells, bacteria, fat, mucus, digestive fluid (chyle), or pus from a bladder or kidney infection.

Odor

Foul-smelling urine is a common symptom of urinary-tract infection. A fruity odor is associated with **diabetes mellitus**, **starvation** and **dehydration**, or ketone formation. Other distinctive odors are present in the urine of patients with maple syrup urine disease or **phenylketonuria** (PKU).

Specific gravity

The specific gravity of urine can be affected by a range of diseases and disorders. Low specific gravity (below 1.005) is associated with **diabetes insipidus**, nephrogenic diabetes insipidus, acute tubular necrosis, and inflammation of the upper urinary tract (**pyelonephritis**). In fixed specific gravity, the specific gravity of the urine remains at 1.010 no matter how much fluid the person drinks. This condition occurs in patients who have chronic inflammation of the small blood vessels in the kidneys (**glomerulonephritis**) and serious kidney damage. High specific gravity (above 1.035) occurs in patients who are in **shock** or who suffer from **nephrotic syndrome**, dehydration, acute glomerulonephritis, congestive **heart failure**, or liver failure.

pH

A pH factor greater than 7 (more alkaline) may result from **Fanconi's syndrome**, urinary tract infections, or metabolic or **respiratory alkalosis**. A pH factor below 7 (more acid) may be due to **fever**, PKU, the secretion of homogentisic acid in the urine (alkaptonuria), and acidosis.

Blood and tissue cells

Red blood cells in the urine can be due to vigorous **exercise** or exposure to toxic chemicals. Bloody urine can also be a sign of bleeding in the genitourinary tract as a result of systemic bleeding disorders, various kidney diseases, bacterial infections, parasitic infections including **malaria**, obstructions in the urinary tract, **scurvy**, subacute bacterial **endocarditis**, traumatic injuries, and tumors.

A high number of white blood cells in the urine is usually a symptom of urinary tract infection. A large number of cells from tissue lining (epithelial cells) can indicate damage to the small tubes that carry material into and out of the kidneys.

Casts

Casts are small fibrous objects that are formed when protein and other materials settle in the kidney tubules and collecting ducts. Casts are dislodged by normal urine flow. A large number of them in a urine specimen is a sign of kidney disease.

KEY TERMS

Acidosis—A condition of the blood in which bicarbonate levels are below normal.

Alkalosis—A condition of the blood and other body fluids in which bicarbonate levels are higher than normal.

Casts—Small fibrous objects formed from materials that collect in the kidney tubules and are washed out by normal urine flow.

Catheter—A thin flexible tube inserted through the urethra into the bladder to allow urine to flow out.

Clean catch specimen—A urine specimen that is collected from the middle of the urine stream after the first part of the flow has been voided.

Colony count—A measurement of the growth of bacteria in a urine sample that has been cultured for 24 to 48 hours.

Fanconi's syndrome—A rare disorder caused by vitamin D deficiency or exposure to heavy metals.

Ketones—Substances produced during the breakdown of fatty acids. They are produced in excessive amounts in diabetes and certain other abnormal conditions.

Nephrotic syndrome—A condition characterized by water retention, little or no protein in urine, and high blood cholesterol.

pH—A chemical symbol used to describe the acidity or alkalinity of a fluid, ranging from 0 (more acid) to 14 (more alkaline).

Urethra—The duct that carries urine from the bladder to the outside of the body.

Urinalysis (plural, urinalyses)—The diagnostic testing of a urine sample.

Voiding—Another word for emptying the bladder or urinating.

Crystals

There are several different chemicals in body fluids that can form crystals that appear in urine. Some of these appear in normal urine, such as calcium oxalate or uric acid crystals. A large number of calcium oxalate crystals, however, may be a sign of abnormally high levels of calcium in the blood (**hypercalcemia**). Other crystals, including tyrosine, leucine, and cholesterol, are abnormal. The presence of cystine crystals is a symptom of excessive urinary secretion of cystine (**cystinuria**). Cystine is an acid found in many proteins and normally reabsorbed by the kidney tubules.

Protein

Protein in the urine can be a symptom of **kidney stones**, inflammation of the kidneys, degenerative kidney disease, or multiple tumors.

Sugars

A high level of glucose and other sugars in the urine (**glycosuria**) is often a symptom of diabetes mellitus. Glycosuria can also be caused by advanced kidney disease, **Cushing's syndrome**, impaired tubular reabsorption, shock, a rare tumor of the adrenal gland (**pheochromocytoma**), or **cancer** of the pancreas.

Milk in the urine is normal if a woman is pregnant, has just given birth, or is breastfeeding. On the other

hand, rare hereditary metabolic disorders are indicated when urine contains fruit sugar (fructose), milk sugar (galactose), or a simple sugar called pentose.

Ketones

The presence of abnormally high numbers of ketones in the urine (ketonuria) usually results from uncontrolled diabetes mellitus. Ketonuria can also be caused by prolonged **diarrhea** or vomiting that results in starvation.

Bilirubin

Bilirubin is an orange-yellow pigment found in bile, a fluid secreted by the liver. When it is found in urine, bilirubin may be a symptom of liver disease caused by the formation of fibrous tissue, medications that damage the liver, or obstructive **jaundice**.

Urobilinogen

Bacteria in the small intestine can convert bilirubin to urobilinogen, which is excreted in the feces, in bile, or in urine. An accumulation of urobilinogen in the urine may be a sign of severe infection, liver damage, or diseases that destroy red blood cells. Low levels of urobilinogen in the urine may be a result of antimicrobial therapy, inflammatory diseases, kidney disease, severe diarrhea, or blocked bile ducts.

Other findings

The presence of bacteria, parasites, or yeast cells in the urine may be a symptom of urinary tract infection or contamination of the external genitalia. Other factors that may affect urinalysis results include failure to collect a specimen during the day's first voiding; frequent urination; large dietary intake of vitamin C; and urine with a pH value lower than 6.

Resources

BOOKS

"Laboratory Diagnosis: Urine Studies." In *Clinician's Pocket Reference*, ed. Leonard G. Gomella. Norwalk, CT: Appleton & Lange, 1993.

ORGANIZATIONS

American Association of Kidney Patients. 100 S. Ashley Dr., #280, Tampa, FL 33602. (800) 749-2257. <<http://www.akp.org>>.

American Kidney Fund. 6110 Executive Boulevard, Rockville, MD 20852. (800) 638-8299. <<http://216.248.130.102/Default.htm>>.

National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). 3 Information Way, Bethesda, MD 20892-3580. (800) 891-5388. <<http://www.niddk.nih.gov/health/urolog/pubs/kuorg/kuorg.htm>>.

Maureen Haggerty

Urinary anti-infectives

Definition

Urinary anti-infectives are medicines used to treat or prevent infections of the urinary tract—the passage through which urine flows from the kidneys out of the body.

Purpose

Normally, no bacteria or other disease-causing organisms live in the bladder. Likewise, the urethra—the tube-like structure that carries urine from the bladder out of the body—usually has either no bacteria or not enough to cause problems. But the bladder, urethra, and other parts of the urinary tract may become infected when disease-causing organisms invade from other body regions or from outside the body. Urinary anti-infectives are used to treat such infections or to prevent them in people who get them often.

Description

Commonly used urinary anti-infectives include methenamine (Urex, Hiprex, Mandelamine), nalidixic

acid (NegGram) and nitrofurantoin (Macrobid, Furatoin, and other brands). These medicines are available only with a physician's prescription and come in capsule, tablet, granule, and liquid forms.

Recommended dosage

Methenamine

For adults and children 12 years and over, the usual dosage is 1 gram, taken either twice a day or four times a day, depending on the form in which the drug comes. For children aged 6–12 years, the dosage ranges from 500 mg taken 2–4 times a day to 1 gram taken twice a day, again depending on the form of the drug. For children under 6 years, a physician must determine the dose.

This medicine will not work properly unless the urine is acidic, with a pH reading of 5.5 or below. The physician who prescribes the medicine will explain how to test the urine's acidity. The physician also may suggest diet changes that will make the urine more acidic, such as eating more protein, drinking cranberry juice, eating plums and prunes, but avoiding most other fruits, and cutting down on milk and other dairy products. **Antacids** also should be avoided.

Nalidixic acid

The recommended dosage for adults and children 12 years and older is 1 gram every 6 hours. If the medicine is taken for more than one or two weeks, the dosage may be decreased to 500 mg every 6 hours. A physician must determine the correct dosage for children 3 months to 12 years old. Children under 3 months should not take this medicine because it causes bone problems in young animals and could have the same effect in young children.

Nitrofurantoin

CAPSULES, TABLETS, OR LIQUID. The usual dose for adults and teenagers is 50–100 mg every six hours.

EXTENDED-RELEASE CAPSULES. For adults and children 12 years and older, the usual dosage is 100 mg every 12 hours for seven days.

For all forms of nitrofurantoin, a physician must determine the correct dose for children one month and older, based on the child's body weight. Children under one month should not take this medicine.

Precautions

Methenamine

People with certain medical conditions may have problems if they take this medicine. For example, people

with severe liver disease may have worsened symptoms of their disease. And people who are dehydrated or who have severe kidney disease may be more likely to have side effects that affect the kidneys.

Nalidixic acid

Some people feel drowsy, dizzy, or less alert than usual when using this drug. The medicine may also cause blurred vision or other vision changes. Because of these possible problems, anyone who takes nalidixic acid should not drive, operate machinery, or do anything else that might be dangerous until they have found out how the drugs affect them.

Nalidixic acid may increase sensitivity to sunlight. Even brief exposure to sun can cause a severe **sunburn** or a rash. While being treated with this medicine, avoid being in direct sunlight, especially between 10 a.m. and 3 p.m.; wear a hat and tightly woven clothing that covers the arms and legs; use a sunscreen with a skin protection factor (SPF) of at least 15; protect the lips with a sun block lipstick; and do not use tanning beds, tanning booths, or sunlamps.

Diabetic patients should be aware that this medicine may cause false results on some urine sugar tests. Check with a physician before making any changes in diet or diabetes medicine based on the results of a urine test.

In laboratory studies, nalidixic acid interferes with bone development in young animals. The drug's effects have not been studied in pregnant women, but because of its effects in animals, it is not recommended for use during **pregnancy**.

This medicine generally does not cause problems in nursing babies whose mothers take it. However, nursing babies with glucose-6-phosphate dehydrogenase (G6PD) deficiency (an inherited disorder that affects mainly black males) may have blood problems if their mothers take nalidixic acid.

People with certain medical conditions may be more likely to have particular side effects if they take this medicine. For example, people with a history of seizures or severe hardening of the arteries in the brain may be more likely to have side effects that affect the nervous system. People with glucose-6-phosphate dehydrogenase (G6PD) deficiency are more likely to have side effects that affect the blood. Also, people with liver disease or severe kidney disease have an increased chance of having any of the drug's possible side effects.

Nitrofurantoin

Pregnant women should not take this medicine within two weeks of their delivery date and should not use it during labor and delivery, as this could cause problems in the baby.

Women who are breastfeeding should check with their physicians before using this medicine. It passes into breast milk and could cause problems in nursing babies whose mothers take it. This is especially true of babies with glucose-6-phosphate dehydrogenase (G6PD) deficiency. The medicine also should not be given directly to babies up to one month of age, as they are particularly sensitive to its effects.

Older people may be more likely to have side effects when taking nitrofurantoin, because they are more sensitive to the drug's effects.

Taking nitrofurantoin may cause problems for people with certain medical conditions. Side effects may be greater, for example, in people with lung disease or nerve damage. In people with kidney disease, the medicine may not work as well as it should, but may cause more side effects. Those with glucose-6-phosphate dehydrogenase (G6PD) deficiency who take nitrofurantoin may develop anemia.

Diabetic patients should be aware that this medicine may cause false results on some urine sugar tests. They should check with a physician before making any changes in diet or diabetes medicine based on the results of a urine test.

General precautions for all urinary anti-infectives

Symptoms should improve within a few days of starting to take a urinary anti-infective. If they do not, or if they become worse, check with a physician right away. Patients who need to take this medicine for long periods should see their physicians regularly, so that the physician can check their progress.

Anyone who has had unusual reactions to urinary anti-infectives in the past should let his or her physician know before taking the drugs again. The physician should also be told about any **allergies** to foods, dyes, preservatives, or other substances. Patients taking nalidixic acid should tell their physicians if they have ever had reactions to related medicines such as cinoxacin (Cinobac), ciprofloxacin (Cipro), enoxacin (Penetrex), norfloxacin (Noroxin) or ofloxacin (Floxin), all of which are also used to treat or prevent infections. Anyone taking nitrofurantoin should let the physician know if he or she has had an unusual reaction to medicines such as furazolidone (Furoxone) or nitrofurazone (Furacin).

Side effects

Methenamine

Nausea and vomiting are not common but may occur. These side effects do not need medical attention unless

they are severe. One side effect that should be brought to a physician's attention immediately is a skin rash.

Nalidixic acid

Some side effects are fairly minor and are likely to go away as the body adjusts to the drug. These include **dizziness**, drowsiness, **headache**, nausea or vomiting, stomach **pain** and **diarrhea**. Unless these problems continue or are bothersome, they do not need medical attention.

Other side effects, however, should have prompt medical attention. Anyone who has changes in vision, such as blurred vision, double vision, decreased vision, changes in color vision, halos around lights, or notices an excessive brightness of lights should check with a physician immediately.

Nitrofurantoin

This medicine may make the urine turn reddish-yellow to brown. This is nothing to worry about. Other possible side effects that do not need medical attention unless they are severe include pain in the stomach or abdomen, stomach upset, diarrhea, loss of appetite, and nausea or vomiting.

Anyone who has chest pain, breathing problems, **fever**, chills, or a **cough** while taking nitrofurantoin should check with a physician immediately.

General advice on side effects for all urinary anti-infectives

Other side effects are possible when taking any urinary anti-infective. Anyone who has unusual symptoms while taking this type of medicine should get in touch with his or her physician.

Interactions

Methenamine

Certain medicines may make methenamine less effective. These include thiazide **diuretics** (water pills) and medicines that make the urine less acid, such as antacids, bicarbonate of soda, and the drugs acetazolamide (Diamox), dichlorphenamide (Daranide), and metazolamide (Neptazane), which are used to treat **glaucoma**, epilepsy, **altitude sickness**, and other conditions.

Nalidixic acid

People who are taking blood thinners (anticoagulants) may be more likely to have bleeding problems if they take this medicine.

KEY TERMS

Altitude sickness—A set of symptoms that people who normally live at low altitudes may have when they travel to high altitudes. The symptoms include nosebleed, nausea, and shortness of breath.

Anemia—A lack of hemoglobin—the compound in blood that carries oxygen from the lungs throughout the body and brings waste carbon dioxide from the cells to the lungs, where it is released.

Bacteria—Tiny, one-celled forms of life that cause many diseases and infections.

Glaucoma—A condition in which pressure in the eye is abnormally high. If not treated, glaucoma may lead to blindness.

Glucose-6-phosphate dehydrogenase (G6PD) deficiency—An inherited disorder in which the body lacks an enzyme that normally protects red blood cells from toxic chemicals. When people with this condition take certain drugs, their red blood cells break down, causing anemia. This may also happen when they have a fever or an infection. The condition usually occurs in males. About 10% of black males have it, as do a small percentage of people from the Mediterranean region.

Granule—A small grain or pellet. Medicines that come in granule form usually are mixed with liquids or sprinkled on food before they are taken.

Organism—An individual of some type of life form, such as a plant or an animal.

pH—A measure of how acidic or alkaline something is. The pH scale ranges from 0 to 14. Values below 7 are acidic; values above 7 are alkaline.

Seizure—A sudden attack, spasm, or convulsion.

Nitrofurantoin

Nitrofurantoin may interact with many other medicines. For example, taking nitrofurantoin with certain drugs that include methyldopa (Aldomet), **sulfonamides** (sulfa drugs), vitamin K, and diabetes medicines taken by mouth may increase the chance of side effects that affect the blood. General side effects are more likely in people who take nitrofurantoin with the **gout drugs** probenecid (Benemid) or sulfapyridine (Anturane). And the risk of side effects that involve the nervous system is higher in people who take nitrofurantoin with various drugs including lithium (Lithane), disulfiram (Antabuse), other anti-infectives, and the **cancer** drugs

cisplatin (Platinol) and vincristine (Oncovin). Patients who have had a DPT (**diphtheria, tetanus**, and pertussis) vaccine within the last 30 days or who have one after taking nitrofurantoin are also more likely to have side effects that affect the nervous system. Because of the many possible interactions, anyone taking nitrofurantoin should be sure to check with a physician before combining it with any other medicine.

General advice about interactions

Not every drug that may interact with a urinary anti-infective is listed here. Be sure to check with a physician or pharmacist before combining a urinary anti-infective with any other prescription or nonprescription (over-the-counter) medicine.

Resources

PERIODICALS

Tucker, M. Susan. "Recurrent UTI: Who Should Treat Herself?" *Patient Care* 26 (15 July 1992): 259.

Nancy Ross-Flanigan

Urinary antiseptics see **Urinary anti-infectives**

Urinary catheterization

Definition

Urinary catheterization is the insertion of a catheter into a patient's bladder. The catheter is used as a conduit to drain urine from the bladder into an attached bag or container.

Purpose

Urinary catheterization is employed in hospital and nursing home settings to maintain urine output in patients who are undergoing surgery, or who are confined to the bed and physically unable to use a bedpan. Critically ill patients who require strict monitoring of urinary output are also frequently catheterized.

Intermittent insertion of a urinary catheter is a treatment option for patients with certain types of **urinary incontinence**. Patients who are unable to completely empty the bladder during urination (urinary retention), or patients who have a bladder obstruction, may also require intermittent urinary catheterization. Disabled individuals with neurological disorders that cause **paralysis** or a loss of sensation in the perineal area may also use regular intermittent catheter insertion to void their bladders.

Precautions

Because urinary catheterization carries a risk of causing urinary tract infection (UTI), precautions should be used to keep the catheter clean and free of bacteria. Patients requiring intermittent catheterization should be well trained in the technique by a qualified health care professional.

Description

Intermittent catheterization is performed a minimum of four times a day by the patient or a care giver. The genital area near the urethral opening is wiped with an antiseptic agent, such as iodine. A lubricant may be used to facilitate the entry of the catheter into the urethra, and a topical local anesthetic may be applied to numb the urethral opening during the procedure. One end of the catheter is placed in a container, and the other end is inserted into and guided up the urethra until urine flow begins. When urine flow stops, the catheter may be moved or rotated, or the patient may change positions to ensure that all urine has emptied from the bladder. The catheter is then withdrawn, cleaned, and sterilized for the next use. Recommended cleaning practices vary, from the use of soap and water to submersion in boiling water or a disinfectant solution. Some patients prefer to use a new catheter with each insertion.

Nonintermittent catheterization, which is initiated in a hospital or nursing home setting, uses the same basic technique for insertion of the urinary tract catheter. The catheter is inserted by a nurse or other health care professional, and remains in the patient until bladder function can be maintained independently. When the catheter is removed, patients will experience a pulling sensation and may feel some minor discomfort. If the catheter is required for an extended period of time, a long-term, indwelling catheter, such as a Foley catheter, is used. To prevent infection, it should be regularly exchanged for a new catheter every three to six weeks.

Use of indwelling catheters should be restricted to patients whose incontinence is caused by urinary tract obstruction that can not be treated, and for which alternative therapy is not feasible.

Preparation

If a patient wishes to perform intermittent catheterization himself, training in the technique by a qualified health care professional is required. Basic instruction in the anatomy, antiseptic techniques, catheter insertion, and proper catheter care should be provided. Patients learning chronic intermittent urinary catheterization may also benefit from an ultrasound examination to verify that they are completely emptying their bladder during the procedure.

KEY TERMS

Bladder obstruction—A blockage of the bladder caused by the presence of calculi (e.g., mineral deposits) or an anatomic abnormality.

Catheter—A long, thin, flexible tube.

Foley catheter—A two-channel catheter with a balloon on the bladder end of one channel. Once inflated, the balloon keeps the catheter securely in the bladder. The other channel of the catheter facilitates the flow of urine out of the bladder.

Local anesthetic—Medication applied topically to the skin or administered through an injection that deadens a specific part of the body and inhibits the sensation of pain.

Perineal area—The genital area between the vulva and anus in a woman, and between the scrotum and anus in a man.

Ultrasound examination—A diagnostic test that uses sound waves to generate a picture of an organ or organ system.

Urinary incontinence—The inability to control one's urine flow.

Aftercare

Patients using intermittent catheterization as a treatment for incontinence will experience a period of adjustment as they try to establish a catheterization schedule that is adequate for their normal level of fluid intake.

Antibiotics may be prescribed as a preventative measure in long-term urinary catheterization patients who are at risk for urinary tract infection.

A patient with an indwelling catheter must be reassessed periodically to determine whether alternative treatment may be more effective in treating the problem.

Risks

Trauma to the urethra and/or bladder may result from incorrect insertion of the catheter. Repeated irritation to the urethra during catheter insertion may cause scarring and/or stricture, or narrowing, of the urethra. The catheter may introduce bacteria into the urethra and bladder, resulting in urinary tract infection. UTI can cause **fever** and inflammation of the bladder and urethra. Patients who practice intermittent catheterization can reduce their risks for UTI by using antiseptic techniques for insertion and catheter care.

Normal results

When used correctly, catheterization facilitates complete voiding of the bladder.

Resources

PERIODICALS

Hunt, Gillian M., Pippa Oakeshott, and Robert Whitaker.

"Intermittent Catheterization: Simple, Safe, and Effective but Underused." *British Medical Journal* 312, no. 7023 (Jan. 1996): 103-7.

U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research.

"Urinary Incontinence in Adults: Acute and Chronic Management." *Clinical Practice Guideline* no. 2 (1996).

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Urinary diversion surgery

Definition

A urinary diversion involves removal of the urinary bladder and adjacent tissues and organs, and re-routing of the urinary stream. This may involve creation of an artificial opening in the abdomen called an **ostomy**.

Purpose

A urinary diversion is created as a means to treat **cancer** of the bladder, when conservative measures have been unsuccessful, or when there is recurrence of the disease invading the muscle wall. Congenital deformities or traumatic injury may also necessitate formation of a urinary diversion.

Description

Under general anesthesia, an incision is made in the abdomen. The ureters (tubes that carry urine away from the kidneys) are cut and tied. The bladder and surrounding tissues are cut free and removed. The ureters are then attached to a portion of the intestine. The most common types of urinary diversion are:

- **Ileal conduit.** Ureters are attached to a portion of the small intestine, the ileum, one end of which is brought through the abdominal wall as a conduit for the urine, creating a stoma.
- **Ureterosigmoidostomy.** The ureters are attached to a portion of the large intestine, the sigmoid, which allows the urine to flow through the large intestine and out through the rectum.

- Cutaneous ureterostomy. Bringing the detached ureters through the abdominal wall and attaching it to an opening in the skin.

Following creation of an artificial opening to drain the urine, ureteral stents (tubes that go through the stoma and up into the ureters) are often inserted and left in place to allow urine to drain freely from the kidneys, without risk of blockage from swelling due to surgery. The muscles are replaced and sewn together. A transparent pouch is applied to the abdomen to collect urine, and attached to a bedside drainage bag. The incision is closed with sutures or clips ("staples"), which are usually removed about 1 week after surgery.

An alternative to a conventional urinary diversion is the continent urinary diversion. In this surgical procedure, a "false bladder" is constructed within the abdomen, using several lengths of small or large intestine. The ureters are sewn to this new reservoir for urine and nipple valves are created at two sites; the abdominal wall for continence; and where the ureters are implanted, to prevent reflux of urine back to the kidneys. The patient is then taught to catheterize the reservoir to drain urine at regular intervals during the day. Although a continent diversion is not suitable for every patient who requires urinary diversion, it is an option to be considered.

Preparation

As with any surgical procedure, the patient will be required to sign a consent form after the procedure is explained thoroughly. Blood and urine studies, along with various x rays and an electrocardiogram (EKG), may be ordered as the doctor deems necessary. If creation of an ostomy is planned, the patient should visit an enterostomal therapist, who will mark an appropriate place on the abdomen for a stoma and offer preoperative education on ostomy management.

Eating or drinking is prohibited after midnight the night before the surgery. Oral anti-infectives, such as neomycin, erythromycin, or kanamycin sulfate, may be ordered to decrease bacteria in the intestine and help prevent postoperative infection. A nasogastric tube is inserted the day of surgery, or during surgery, to remove gastric secretions and prevent **nausea and vomiting**.

Aftercare

Postoperative care for the patient with a urinary diversion, as with those who have had any major surgery, involves monitoring of blood pressure, pulse, respirations, and temperature. Breathing tends to be shallow because of the effect of anesthesia, and the patient is reluctant to breathe deeply and experience **pain** that is caused by the

abdominal incision. The patient is shown how to support the operative site during deep breathing and coughing, and is given pain medication as necessary. Fluid intake and output are measured, and the operative site is observed for color and amount of wound drainage. The nasogastric tube will remain in place, attached to low intermittent suction, until bowel activity resumes. Fluids and electrolytes are infused intravenously until the patient's diet can gradually be resumed, beginning with liquids. The patient is usually able to move about in 8–24 hours after surgery, and is discharged from the hospital in 5–10 days.

If an ostomy has been placed, the patient and close family members will be educated on how to care for it. Determination of appropriate pouching supplies and a schedule of how often to change the pouch should be established. Regular assessment and meticulous care of the skin surrounding the stoma is important to maintain an adequate surface on which to apply the pouch. The pouch should be connected to a bedside drainage bag at night to prevent large volumes of urine from collecting in the pouch. Otherwise, the weight of the pouch could cause disruption of the pouch seal and leakage of urine onto the surrounding skin. Often, an enterostomal therapist will visit the patient at home after discharge to help the new ostomy patient make the transition back to normal daily activities.

Risks

Potential complications of urinary diversion surgery include:

- excessive bleeding
- surgical wound infection
- thrombophlebitis (inflammation and blood clot to veins in the legs)
- pneumonia
- pulmonary **embolism** (blood clot or air bubble in the lungs' blood supply)

Normal results

Complete healing is expected without complications. The amount of time required for recovery from the surgery may vary depending of the patient's overall health status prior to surgery. The patient with a urinary diversion, without other medical complications, should be able to resume all daily activities once recovered from the surgery.

Abnormal results

The doctor should be made aware of any of the following problems after surgery:

KEY TERMS

Ischemia—A compromise in blood supply to body tissues that causes tissue damage or death.

Ostomy—A surgically-created opening in the abdomen for elimination of waste products (urine or stool).

- Increased pain, swelling, redness, drainage, or bleeding in the surgical area
- Headache, muscle aches, **dizziness**, or **fever**
- Increased abdominal pain or swelling, **constipation**, nausea, or vomiting.

Stomal complications to be monitored include:

- Stomal tissue **death** (necrosis). This occurs because of inadequate blood supply, this is usually visible 12 to 24 hours after surgery. It may require additional surgery.
- Stoma flush or below the abdomen surface (retraction). Caused by insufficient stoma length, this may be managed by use of special pouching supplies. Elective revision of the stoma is also an option.
- Narrowing at the opening of the stoma (stenosis). Often associated with infection around the stoma or scarring, mild stenosis can be removed under local anesthesia. Severe stenosis may require surgery for stomal revision.
- Parastomal **hernia**. The bowel causes a bulge in the abdominal wall next to the stoma. This is usually due to placement of the stoma where the abdominal wall is weak, or an overly large opening in the abdominal wall. Use of an ostomy support belt and special pouching supplies may be adequate. If severe, the defect in the abdominal wall should be repaired and the stoma moved to another location.

Resources

BOOKS

- Doughty, Dorothy. *Urinary and Fecal Incontinence*. St. Louis: Mosby-Year Book, Inc., 1991.
- Hampton, Beverly, and Ruth Bryant. *Ostomies and Continent Diversions*. St. Louis: Mosby-Year Book, Inc., 1992.
- Monahan, Frances. *Medical-Surgical Nursing*. Philadelphia: W. B. Saunders Co., 1998.
- Suddarth, Doris. *The Lippincott Manual of Nursing*. Philadelphia: J. B. Lippincott, 1991.

ORGANIZATIONS

- United Ostomy Association, Inc. (UOA). 19772 MacArthur Blvd., Suite 200, Irvine, CA 92612-2405. (800) 826-0826. <<http://www.uoa.org>>.

Wound Ostomy and Continence Nurses Society. 1550 South Coast Highway, Suite #201

OTHER

"Bladder Removal." ThriveOnline. 20 Apr. 1998 <<http://thriveonline.oxygen.com>>.

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Urinary incontinence

Definition

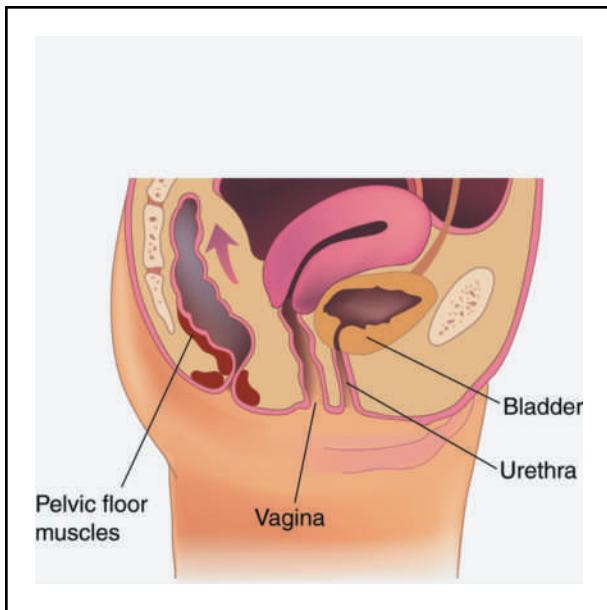
Urinary incontinence is unintentional loss of urine that is sufficient enough in frequency and amount to cause physical and/or emotional distress in the person experiencing it.

Description

Approximately 13 million Americans suffer from urinary incontinence. Women are affected by the disorder more frequently than are men; one in 10 women under age 65 suffer from urinary incontinence. Older Americans, too, are more prone to the condition. Twenty percent of Americans over age 65 are incontinent.

There are five major categories of urinary incontinence: overflow, **stress**, urge, functional, and reflex.

- **Overflow incontinence.** Overflow incontinence is caused by bladder dysfunction. Individuals with this type of incontinence have an obstruction to the bladder or urethra, or a bladder that doesn't contract properly. As a result, their bladders do not empty completely, and they have problems with frequent urine leakage.
- **Stress incontinence.** Stress incontinence occurs when an individual involuntarily loses urine after pressure is placed on the abdomen (i.e., during **exercise**, sexual activity, sneezing, coughing, laughing, or hugging).
- **Urge incontinence.** Urge incontinence occurs when an individual feels a sudden need to urinate, and cannot control the urge to do so. As a consequence, urine is involuntarily lost before the individual can get to the toilet.
- **Functional incontinence.** Individuals who have control over their own urination and have a fully functioning urinary tract, but cannot make it to the bathroom in time due to a physical or cognitive disability, are functionally incontinent. These individuals may suffer from arthritis, **Parkinson's disease**, **multiple sclerosis**, or **Alzheimer's disease**.
- **Reflex incontinence.** Individuals with reflex incontinence lose control of their bladder without warning. They typically suffer from neurological impairment.



Strengthening the pelvic floor muscles by performing Kegel exercises helps to alleviate stress incontinence in women. Contract the pelvic floor muscles as if stopping an imaginary flow of urine. Hold for 10 seconds and repeat. (Illustration by Electronic Illustrators Group.)

In some cases, an individual may develop short-term or *acute incontinence*. Acute incontinence may occur as a symptom or by-product of illness, as a side effect of medication, or as a result of dietary intake. The condition is typically easily resolved once the cause is determined and addressed.

Causes and symptoms

Urinary incontinence can be caused by a wide variety of physical conditions, including:

- **Childbirth.** Childbirth can weaken the pelvic muscles and cause the bladder to lose some support from surrounding muscles, resulting in stress incontinence.
- Dysfunction of the bladder and/or the urinary sphincter. In a continent individual, as the bladder contracts, the outlet that releases urine into the urethra (bladder sphincter) opens and urine exits the body. In individuals with overflow incontinence, bladder contractions and dilation of the sphincter do not occur at the same time.
- **Enlarged prostate.** In men, an enlarged prostate gland can obstruct the bladder, causing overflow incontinence.
- **Hysterectomy** or other gynecological surgery. Any surgery involving the urogenital tract runs the risk of damaging or weakening the pelvic muscles and causing incontinence.

- Menopause. The absence of estrogen in the post-menopausal woman can cause the bladder to drop, or prolapse.

- Neurological conditions. The nervous system sends signals to the bladder telling it when to start and stop emptying. When the nervous system is impaired, incontinence may result. Neurological conditions such as multiple sclerosis, **stroke**, spinal cord injuries, or a **brain tumor** may cause the bladder to contract involuntarily, expelling urine without warning, or to cease contractions completely, causing urinary retention.

- Obesity. Individuals who are overweight have undue pressure placed on their bladder and surrounding muscles.

- Obstruction. A blockage at the bladder outlet may permit only small amounts of urine to pass, resulting in urine retention and subsequent overflow incontinence. Tumors, calculi, and scar tissue can all block the flow of urine. A urethral stricture, or narrow urethra caused by scarring or inflammation, may also result in urine retention.

Acute incontinence is a temporary condition caused by a number of factors, including:

- Bladder irritants. Substances in the urine that irritate the bladder may cause the bladder muscle to malfunction. The presence of a urinary tract infection and the ingestion of excess **caffeine** can act as irritants. Highly concentrated urine resulting from low fluid intake may also irritate the bladder.
- **Constipation.** Constipation can cause incontinence in some individuals. Stool that isn't passed presses against the bladder and urethra, triggering urine leakage.
- Illness or disease. Diabetes can greatly increase urine volume, making some individuals prone to incontinence. Other illnesses may temporarily impair the ability to recognize and control the urge to urinate, or to reach the toilet in time to do so.
- Medications and alcohol. Medications that sedate, such as tranquilizers and sleeping pills, can interfere with the proper functioning of the urethral nerves and bladder. Both sedatives and alcohol can also impair an individual's ability to recognize the need to urinate, and act on that need in a timely manner. Other medications such as **diuretics**, **muscle relaxants**, and blood pressure medication can also affect bladder function.
- Surgery. Men who undergo prostate surgery can suffer from temporary stress incontinence as a result of damage to the urethral outlet.

Diagnosis

Urinary incontinence may be diagnosed by a general practitioner, urologist, or gynecologist. If the patient is

over age 65, a geriatrician may diagnose and treat the condition. A thorough medical history and **physical examination** is typically performed, along with specific diagnostic testing to determine the cause of the incontinence. Diagnostic testing may include x rays, ultrasound, urine tests, and a physical examination of the pelvis. It may also include a series of exams that measure bladder pressure and capacity and the urinary flow (urodynamic testing). The patient may also be asked to keep a diary to record urine output, frequency, and any episodes of incontinence over a period of several days or a week.

Treatment

There are numerous invasive and noninvasive treatment options for urinary incontinence:

- **Bladder training.** Used to treat urge incontinence, bladder training involves placing a patient on a toileting schedule. The time interval between urination is then gradually increased until an acceptable time period between bathroom breaks is consistently achieved.
- **Biofeedback.** The use of sensors to monitor temperature and muscle contractions in the vagina to help incontinent patients learn to control their pelvic muscles.
- **Collagen injections.** Collagen injected in the tissue surrounding the urethra can provide urethral support for women suffering from stress incontinence.
- **Inflatable urethral insert.** Sold under the tradename Reliance, this disposable incontinence balloon for women is inserted into the urethra and inflated to prevent urine leakage.
- **Intermittent urinary catheterization.** The periodic insertion of a catheter into a patient's bladder to drain urine from the bladder into an attached bag or container.
- **Medication.** Estrogen **hormone replacement therapy** can help improve pelvic muscle tone in postmenopausal women. Anticholinergics (i.e., propantheline, or Pro-Banthine) and antispasmodics (i.e., oxybutynin, or Ditropan) are sometimes prescribed to relax the bladder muscles. Other over-the-counter medications such as pseudoephedrine (i.e., Actifed, Benadryl, Dimetapp) and phenylpropanolamine (i.e., Dexatrim, Acutrim) may be prescribed to tighten the urethral sphincter.
- **Pelvic toning exercises.** Exercises to tone the pelvic muscle can help alleviate stress incontinence in both men and women. These exercises involve tightening the muscles of the pelvic floor, and are also known as Kegel or PC muscle exercises.
- **Perineal stimulation.** Perineal stimulation is used to treat stress incontinence. The treatment uses a probe to

deliver a painless electrical current to the perineal area muscles. The current tones the muscle by contracting it.

- **Permanent catheterization.** A permanent, or indwelling, catheter may be prescribed for chronic incontinence that doesn't respond to other treatments. A Foley catheter is usually used for urinary catheterization. One end is inserted through the urethra and into the bladder, and the external end is attached to a plastic reservoir bag that the patient may wear on the leg. A second alternative is a permanent catheter, called a suprapubic tube, surgically inserted into the bladder. The tube exits the body through the abdomen near the pubic bone, where it is attached to a drainage bag. As infection may result, this treatment should be reevaluated periodically, and the possibility of alternative treatment addressed.
- **Surgery.** Bladder neck suspension surgery is used to correct female urinary stress incontinence. Surgical techniques such as the Marshall-Marchetti-Krantz and Burch procedures use sutures to raise and support the bladder neck and urethra. A sling procedure, which uses a strip of biocompatible material or the patient's own muscle or tissue as a supportive sling under the urethra and bladder neck, may also be used to treat stress incontinence. Bladder enlargement surgery may be recommended to treat incontinent men and women with unusually small bladders.
- **Urinary sphincter implant.** An artificial urinary sphincter may be used to treat incontinence in men and women with urinary sphincter impairment.
- **Vaginal inserts.** Devices constructed of silicone or other pliable materials that can be inserted into a woman's vagina to support the urethra.

Prognosis

Left untreated, incontinence can cause physical and emotional upheaval. Individuals with long-term incontinence suffer from urinary tract infections, and skin **rashes** and sores. Incontinence can also affect their self-esteem and cause depression and social withdrawal. They frequently stop participating in physical activities they once enjoyed because of the risk of embarrassing "accidents." However, with the wide variety of treatment options for incontinence available today, the prognosis for incontinent patients is promising. If incontinence cannot be stopped, it can be improved in the majority of cases.

Prevention

Women who are pregnant or who have gone through childbirth can reduce their risk for stress incontinence by strengthening their perineal area muscles with Kegel exercises. Men who have undergone prostate surgery

KEY TERMS

Bladder neck—The place where the urethra and bladder join.

Bladder sphincter—The outlet that releases urine into the urethra.

Calculi—Mineral deposits that can form a blockage in the urinary system.

Perineal area—The genital area between the vulva and anus in a woman, and between the scrotum and anus in a man.

may also benefit from pelvic muscle exercises. Men and women should consult with their doctor before initiating any type of exercise program.

Resources

BOOKS

- Blaivas, Jerry. *Conquering Bladder and Prostate Problems: The Authoritative Guide for Men and Women*. New York: Plenum, 1998.
- King, Barbara, and Judy Harke. *Coping with Bowel and Bladder Problems*. San Diego: Singular Publishing Group, 1994.

PERIODICALS

- Sandroff, Ronni. "Urgent Matters: Incontinence is Treatable, if Only Women Would Talk about It." *American Health for Women* 16, no.8 (Oct 1997): 28-30.
- Strange, Carolyn J. "Incontinence Can Be Controlled." *FDA Consumer* 31, no. 5 (July/Aug. 1997): 28-31.

ORGANIZATIONS

- American Foundation for Urologic Disease. 1128 North Charles St., Baltimore, MD 21201. (800) 242-2383. <<http://www.afud.org>>.
- National Association for Continence. P.O. Box 8310, Spartanburg, SC 29305-8310. (800) 252-3337. <<http://www.nafc.org>>.
- National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). 3 Information Way, Bethesda, MD 20892-3580. (800) 891-5388. <<http://www.niddk.nih.gov/health/urolog/pubs/kuorg/kuorg.htm>>.

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Urinary tract infections see **Cystitis; Nongonococcal urethritis; Urethritis**

Urine concentration test see **Kidney function tests**

Urine culture

Definition

A urine culture is a diagnostic laboratory test performed to detect the presence of bacteria in the urine (bacteriuria).

Purpose

Culture of the urine is a method of diagnosis for urinary tract infection that determines the number of microorganisms present in a given quantity of urine.

Precautions

If delivery of the urine specimen to the laboratory within one hour of collection is not possible, it should be refrigerated. The health care provider should be informed of any antibiotics currently or recently taken.

Description

There are several different methods for collection of a urine sample. The most common is the midstream clean-catch technique. Hands should be washed before beginning. For females, the external genitalia (sex organs) are washed two or three times with a cleansing agent and rinsed with water. In males, the external head of the penis is similarly cleansed and rinsed. The patient is then instructed to begin to urinate, and the urine is collected midstream into a sterile container. In infants, a urinary collection bag (plastic bag with an adhesive seal on one end) is attached over the labia in girls or a boy's penis to collect the specimen.

Another method is the catheterized urine specimen in which a lubricated catheter (thin rubber tube) is inserted through the urethra (tube-like structure in which urine is expelled from the bladder) into the bladder. This avoids contamination from the urethra or external genitalia. If the patient already has a urinary catheter in place, a urine specimen may be collected by clamping the tubing below the collection port and using a sterile needle and syringe to obtain the urine sample; urine cannot be taken from the drainage bag, as it is not fresh and has had an opportunity to grow bacteria at room temperature. On rare occasions, the health care provider may collect a urine sample by inserting a needle directly into the bladder (suprapubic tap) and draining the urine; this method is used only when a sample is needed quickly.

Negative culture results showing no bacterial growth are available after 24 hours. Positive results require 24–72 hours to complete identification of the number and type of bacteria found.

KEY TERMS

Bacteriuria—The presence of bacteria in the urine.

OTHER

“Urine culture.” HealthAnswers.com 27 Feb. 1998. <<http://www.healthanswers.com>>.

“Urine Culture.” ThriveOnline. 25 Feb. 1998 <<http://thriveonline.oxygen.com>>.

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Preparation

Drinking a glass of water 15–20 minutes before the test is helpful if there is no urge to urinate. There are no other special preparations or aftercare required for the test.

Risks

There are no risks associated with the culture test itself. If insertion of a urinary catheter (thin rubber tube) is required to obtain the urine, there is a slight risk of introducing infection from the catheter.

Normal results

No growth of bacteria is considered the normal result, and this indicates absence of infection.

Abnormal results

Abnormal results, or a positive test, where bacteria are found in the specimen, may indicate a urinary tract infection. Contamination of the specimen from hair, external genitalia, or the rectum may cause a false-positive result. Identification of the number and type of bacteria, with consideration of the method used in obtaining the specimen, is significant in diagnosis.

Escherichia coli causes approximately 80% of infections in patients without catheters, abnormalities of the urinary tract, or calculi (stones). Other bacteria that account for a smaller portion of uncomplicated infections include *Proteus klebsiella* and *Enterobacter*.

Resources

BOOKS

David, Alan K., et al. *Family Medicine: Principles and Practice*. New York: Springer Verlag, Inc., 1994.

Malarkey, Louise, and Mary Ellen McMorrow. *Nurse's Manual of Laboratory Tests and Diagnostic Procedures*. Philadelphia: W. B. Saunders Co., 1996.

ORGANIZATIONS

American Foundation for Urologic Disease. 300 West Pratt St., Suite 401, Baltimore, MD 21201.

National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). 3 Information Way, Bethesda, MD 20892-3580. (800) 891-5388. <<http://www.niddk.nih.gov/health/urolog/pubs/kuorg/kuorg.htm>>.

Urine flow test

Definition

A urine flow test evaluates the speed of urination, or amount voided per second, and the total time of urination.

Purpose

A urine flow test is utilized to determine bladder function abnormalities, including a narrowed or obstructed urethra (the outflow passage from the bladder) and a weakened bladder muscle (detrusor).

Description

During a urine flow test, the patient urinates into a uroflowmeter, a funnel-shaped device that reads, measures, and computes the rate and amount of urine flow. The test takes approximately 10 minutes.

Preparation

The patient is prohibited from urinating at least two hours before the procedure.

Normal results

Average urine flow rates vary depending on age and gender.

Abnormal results

A urine flow test can indicate problems in bladder function, such as an obstruction, that will need further tests to diagnose.

Resources

BOOKS

Pagana, Kathleen Deska. *Mosby's Manual of Diagnostic and Laboratory Tests*. St. Louis: Mosby, Inc., 1998.

Walsh, Patrick C., et al., ed. *Campbell's Urology*. Philadelphia: W. B. Saunders Co., 1998.

J. Ricker Polsdorfer, MD

KEY TERMS

Detrusor muscle—Bladder muscle.

Urethra—Passageway that carries urine from the bladder.

Urography see **Intravenous urography**

Urticaria see **Hives**

Uterine cancer see **Endometrial cancer**

Uterine fibroids

Definition

Uterine fibroids (also called leiomyomas or myomas) are benign growths of the muscle inside the uterus. They are not cancerous, nor are they related to **cancer**. Fibroids can cause a wide variety of symptoms, including heavy menstrual bleeding and pressure on the pelvis.

Description

Uterine fibroids are extremely common. About 25% of women in their reproductive years have noticeable fibroids. There are probably many more women who have tiny fibroids that are undetected.

Fibroids develop between the ages of 30–50. They are never seen in women less than 20 years old. After **menopause**, if a woman does not take estrogen, fibroids shrink. It appears that African-American women are much more likely to develop uterine fibroids.

Fibroids are divided into different types, depending on the location. Submucous fibroids are found in the uterine cavity; intramural fibroids grow on the wall of the uterus; and subserous fibroids are located on the outside of the uterus. Many fibroids are so large that they fit into more than one category. The symptoms caused by fibroids are often related to their location.

Causes and symptoms

No one knows exactly what causes fibroids. However, the growth of fibroids appears to depend on the hormone estrogen. Fibroids often grow larger when estrogen levels are high, as in **pregnancy**. Medications that lower the estrogen level can cause the fibroids to shrink.

The signs and symptoms of fibroids include:

- Heavy uterine bleeding. This is the most common symptom, occurring in 30% of women who have fibroids. The excess bleeding usually happens during the menstrual period. Flow may be heavier, and periods may last longer. Women who have submucous or intramural fibroids are most likely to have heavy uterine bleeding.
- Pelvic pressure and **pain**. Large fibroids that press on nearby structures such as the bladder and bowel can cause pressure and pain. Larger fibroids tend to cause worse symptoms.
- Infertility. This is a rare symptom of fibroids. It probably accounts for less than 3% of infertility cases. Fibroids can cause infertility by compressing the uterine cavity. Submucous fibroids can fill the uterine cavity and interfere with implantation of the fertilized egg.
- Miscarriage. This is also an unusual symptom of fibroids, probably accounting for only a tiny fraction of the miscarriages that occur.
- Pregnancy complications. Fibroids can greatly increase in size during pregnancy, because of increased levels of estrogen. They can cause pain, and even lead to **premature labor**.

Diagnosis

A health care provider can usually feel fibroids during a routine pelvic examination. Ultrasound can be used to confirm the diagnosis, but this is not necessary.

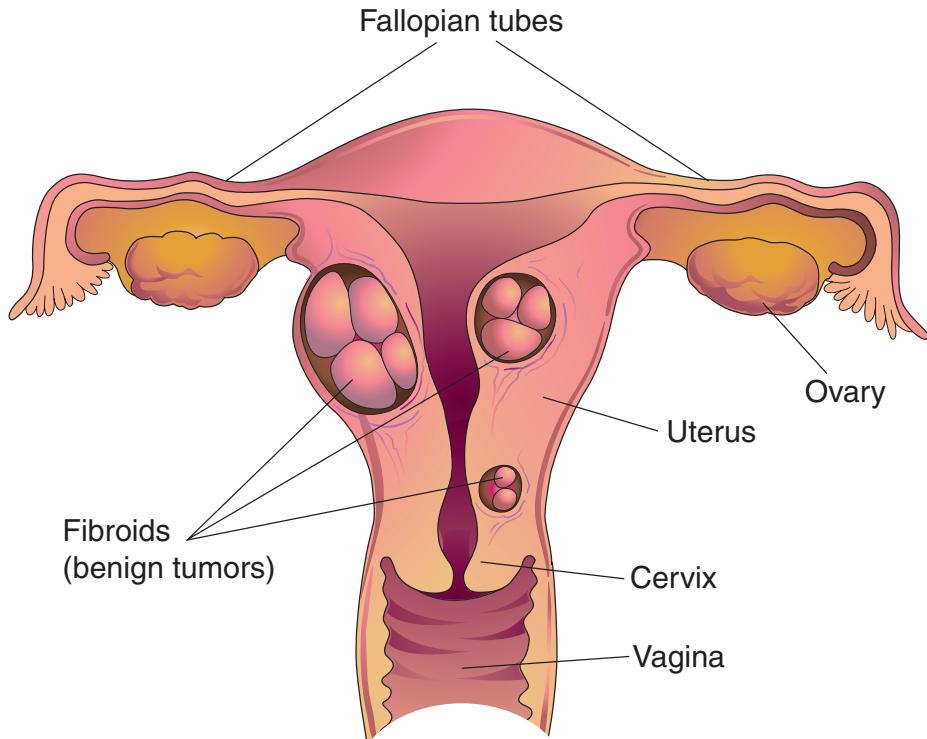
Treatment

Not all fibroids cause symptoms. Even fibroids that do cause symptoms may not require treatment. In the majority of cases, the symptoms are inconvenient and unpleasant, but do not result in health problems.

Occasionally, fibroids lead to such heavy menstrual bleeding that the woman becomes severely anemic. In these cases, treatment of the fibroids may be necessary. Very large fibroids are much harder to treat. Therefore, many doctors recommend treatment for moderately-sized fibroids, in the hopes of preventing them from growing into large fibroids that cause worse symptoms.

The following are possible treatment plans:

- Observation. This is the most common plan. Most women already have symptoms at the time their fibroids are discovered, but feel that they can tolerate their symptoms. Therefore, no active treatment is given, but the woman and her physician stay alert for signs that the condition might be getting worse.



Uterine fibroids are benign growths of uterine muscle and are very common. They are divided into three types, depending on the location. Submucous fibroids are found in the uterine cavity; intramural fibroids grow on the wall of the uterus; and subserous fibroids are located outside of the uterus. (Illustration by Electronic Illustrators Group.)

- **Hysterectomy.** This involves surgical removal of the uterus, and it is the only real cure for fibroids. In fact, 25% of hysterectomies are performed because of symptomatic fibroids. By the time a woman has a hysterectomy for fibroids, she has usually endured several years of worsening symptoms. That's because fibroids tend to grow over time. A gynecologist can remove a fibroid uterus during either an abdominal or a vaginal hysterectomy. The choice depends on the size of the fibroids and other factors such as previous births and previous surgeries.

- **Myomectomy.** In this surgical procedure only the fibroids are removed; the uterus is repaired and left in place. This is the surgical procedure many women choose if they are not finished with childbearing. At first glance, it seems that this treatment is a middle ground between observation and hysterectomy. However, myomectomy is actually a difficult surgical procedure, more difficult than a hysterectomy. Myomectomy often causes significant blood loss, and blood transfusions may be required. In addition, some fibroids are so large, or buried so deeply within the wall of the uterus, that it is not possible to save

the uterus, and a hysterectomy must be done, even though it was not planned. There are exceptions to this, however. Sometimes, fibroids grow on a stalk (pedunculated fibroids), and these are easy to remove.

- **Medical treatment.** Since fibroids are dependent on estrogen for their growth, medical treatments that lower estrogen levels can cause fibroids to shrink. A group of medications known as GnRH antagonists can dramatically lower estrogen levels. Women who take these medications for three to six months find that their fibroids shrink in size by 50% or more. They usually experience dramatic relief of their symptoms of heavy bleeding and pelvic pain.

Unfortunately, GnRH antagonists cause unpleasant side effects in over 90% of women. The therapy is usually used for only three months, and should not be used for more than six months because the risk of developing brittle bones (**osteoporosis**) begins to rise. Once the treatment is stopped, the fibroids begin to grow back to their original size. Within six months, most of the old symptoms return. Therefore, GnRH antagonists cannot be used as long-term solution. At the moment, treatment

KEY TERMS

Anemia—Low blood count.

GnRH antagonists—A group of medications that affect the reproductive hormones. These medications are used to treat fibroids, endometriosis, and infertility.

Hysterectomy—Removal of the uterus (with or without removal of the ovaries) by surgery. The surgery can be performed through an incision in the abdomen, or the uterus can be removed through the vagina.

Menopause—The end of the reproductive years, signaled by the end of menstrual periods. Also known as “the change.”

Osteoporosis—Brittle bones commonly found in elderly women.

with GnRH antagonists is used mainly in preparation for surgery (myomectomy or hysterectomy). Shrinking the size of the fibroids makes surgery much easier, and reducing the heavy bleeding allows a woman to build up her **blood count** before surgery.

Fibroids can cause problems during pregnancy because they often grow in size. Large fibroids can cause pain and lead to premature labor. Fibroids cannot be removed during pregnancy because of the risk of injury to the uterus and hemorrhage. GnRH antagonists cannot be used during pregnancy. Treatment is limited to pain medication and medication to prevent premature labor, if necessary.

Prognosis

Many women who have fibroids have no symptoms or have only minor symptoms of heavy menstrual bleeding or pelvic pressure. However, fibroids tend to grow over time, and gradually cause more symptoms. Many women ultimately decide to have some form of treatment. Currently, hysterectomy is the most popular form of treatment.

Prevention

Uterine fibroids cannot be prevented.

Resources

BOOKS

Friedman, Andrew J. “Uterine Fibroids.” In *Primary Care of Women*, ed. Karen J. Carlson and Stephanie A. Eisenstat. St. Louis: Mosby-Year Book, Inc., 1995.

Muto, Michael G., and Andrew J. Friedman. “Leiomyomas.” In *Kistner’s Gynecology*. 6th ed. Ed. Kenneth J. Ryan, Ross S. Berkowitz, and Robert L. Barbieri. St. Louis: Mosby, 1995.

Amy B. Tuteur, MD

Uterus x rays see **Hysterosalpingography**

Uveitis

Definition

Uveitis is an inflammation of the uveal tract, which lines the inside of the eye behind the cornea. Much of the uvea lies between the retina and tough, outer sclera. The uveal tract has three parts: the iris, the ciliary body, and the choroid. Uveitis is categorized according to the part of the uveal tract that is affected. Anterior uveitis is an inflammation of the front part of the uveal tract; it includes inflammation of the iris (iritis) and inflammation of the iris and the ciliary body (iridocyclitis). Posterior uveitis is an inflammation of the part of the uveal tract behind the lens of the eye. It includes inflammation of the choroid (choroiditis) and inflammation of the choroid and retina (chorioretinitis). Uveitis that affects the entire uveal tract is called panuveitis or diffuse uveitis.

Description

The uveal tract is made up of the iris, ciliary body, and choroid. The iris is the colored part of the eye. The ciliary body is inside the eye and produces a fluid called aqueous humor. Ciliary muscles aid in accommodation, the process of changing the shape of the lens in the eye to see things at various distances. The choroid lines the back of the eye and has many blood vessels. It helps nourish part of the retina. The choroid lies between the retina and outermost sclera.

Uveitis may either persist for a long time (chronic) or have a short-term duration (acute). Anterior uveitis is classified as either granulomatous or nongranulomatous. The distinction is based on the disease agents that were considered responsible for the condition. At one time, it was thought that granulomatous uveitis was caused by **tuberculosis** bacilli whereas nongranulomatous uveitis was thought to be caused by streptococci. The distinction is still used even though the causes of uveitis are now understood differently.

In most cases, uveitis affects only one eye, although posterior uveitis sometimes involves both eyes. About 60% of cases develop within the eye itself, but 40% are

associated with systemic diseases or disorders ranging from **toxoplasmosis** to **syphilis**. Many of these are diseases of childhood and adolescence. Uveitis does not appear to run in families or to be associated with lifestyle choices, occupational history, geographical location, or environmental factors.

Uveitis is a serious condition that may develop rapidly and cause lasting damage to the eye. Patients who think they may have chronic uveitis should seek evaluation and treatment by an ophthalmologist (a physician who specializes in diseases of the eye) as soon as possible. If the patient has a sudden loss of vision and the eye looks inflamed, the patient should go *immediately* to the doctor for emergency treatment.

Causes and symptoms

The causes of uveitis are not fully understood, but they can be a result of trauma, allergy, or a response to a systemic or ocular disease. Uveitis may be a type of immune-response mechanism. In people with impaired immune systems, uveitis may be due to an infection.

Chronic uveitis is often associated with systemic disorders (e.g., **Lyme disease**, **sarcoidosis**, or juvenile **rheumatoid arthritis**).

Anterior uveitis

The so-called classic symptoms of anterior uveitis—severe **pain**; redness, particularly around the edge of the iris; and extreme sensitivity to light (photophobia)—occur mostly in acute uveitis. In anterior uveitis, the doctor will see a so-called “flare and cell” pattern when looking into the watery fluid (aqueous humor) between the cornea and the lens of the patient’s eye. The iris may adhere to the lens, thus increasing the intraocular pressure. There may be nodules on the iris. There may be tearing and the pupil may be constricted and nonreactive. In severe cases of anterior uveitis, there may be hypopyon (a small amount of pus or collection of white cells) visible when the doctor examines the eye.

GRANULOMATOUS UVEITIS. In granulomatous uveitis, there will be large yellowish-white cells visible on the back of the cornea, and possibly some small nodules on the iris. Granulomatous uveitis is usually less acute than the non-granulomatous form; the eye is only mildly inflamed and the patient’s vision is somewhat blurred.

Granulomatous uveitis can be produced by syphilis, toxoplasmosis, cytomegalovirus, sarcoidosis, tuberculosis, or Vogt-Koyonagi-Harada syndrome (VKH). VKH is marked by severe uveitis associated with hair loss, **hearing loss**, loss of pigment in the eyelashes and brows, and headaches. It occurs most commonly in Asians.



This person has acute iritis, or inflammation of the iris. Symptoms include pain in the eye or forehead and reddening of the margin of the iris. Treatment requires total rest of the eye (dark glasses and atropine drops which paralyze the muscles of accommodation), accompanied by application of corticosteroids. (Photo Researchers, Inc. Reproduced by permission.)

NONGRANULOMATOUS UVEITIS. In nongranulomatous uveitis, the cells visible on the cornea are smaller, and there are no masses on the iris. This type of anterior uveitis is, however, more painful. The eye is red and the patient experiences both photophobia and loss of vision.

Systemic diseases that can cause nongranulomatous uveitis include **ankylosing spondylitis**, **Reiter’s syndrome**, **psoriasis**, **ulcerative colitis**, **Behcet’s syndrome**, Lyme disease, and **Crohn’s disease**. Children—especially girls—with anterior uveitis should be screened for juvenile rheumatoid arthritis (JRA).

Posterior uveitis

The symptoms of posterior uveitis are sometimes subtle. The patient may notice blurred or hazy vision, or floating black spots before the eyes. There may be pain and photophobia. The iris may attach to the lens in the eye thus increasing intraocular pressure.

Posterior uveitis may be acute or chronic. It is more likely to involve both eyes. When the doctor examines the eye, cells may be seen in the vitreous humor, which is the normally transparent gel that fills the eyeball behind the lens. There will be yellowish or dark areas of inflammation on the choroid and the retina. The blood vessels in the retina develop a sheath or covering of inflammatory tissue. In severe cases, the vitreous humor is so cloudy that the doctor cannot see the retina at the back of the eye.

PARS PLANITIS. Pars planitis is an inflammation of the pars plana, which is a part of the ciliary body. Pars planitis usually occurs in older children or young adults, and can develop into posterior uveitis.

KEY TERMS

Choroid—The part of the uveal tract behind the ciliary body. The choroid underlies and nourishes the retina and absorbs scattered light.

Ciliary body—The part of the uveal tract between the iris and the choroid.

Cornea—The transparent front part of the eye that covers the iris and pupil.

Flare and cell—A pattern revealed by slit-lamp examination that indicates uveitis. Flare and cell resembles light filtered through smoke.

Hypopyon—A small amount of pus or collection of white cells that is visible in the front of the eye in severe cases of anterior uveitis.

Iris—The circular membrane that forms the colored portion of the eye and expands or contracts around the pupil.

Photophobia—Extreme sensitivity to light. Photophobia is a major symptom of acute uveitis.

Pupil—The opening in the center of the iris that allows light to pass through to the retina.

Retina—The innermost membrane at the back of the eyeball on which images are projected by the lens.

Slit lamp—An instrument that combines a binocular microscope with special lights. It allows an eye doctor to examine the front portion of the eye.

Uveal tract—The pigmented membrane that lines the back of the retina of the eye and extends forward to include the iris. The uveal tract is sometimes called the uvea and has three parts: the iris, the choroid, and the ciliary body.

Vitreous humor—The clear gel-like substance that fills the eyeball behind the lens.

The diseases that cause granulomatous uveitis may also cause posterior uveitis.

Diagnosis

The eye doctor will examine the patient's eyes with a slit lamp in order to rule out **conjunctivitis** and certain types of **glaucoma**. The slit lamp is an instrument that combines a binocular microscope with a special light. The slit lamp can shine a narrow beam of very bright light into the eye and allow the doctor to examine the front part of the eye in detail. The slit-lamp exam is not

painful, however if the patient is sensitive to light there will be discomfort.

The absence of a discharge from the eye and the absence of infectious organisms in a laboratory smear usually rule out conjunctivitis. In addition, the size of the pupil is often small in uveitis whereas it is normal in conjunctivitis. In acute glaucoma, the patient has severe pain, the cornea of the eye is cloudy, and the pressure level of the fluid inside the eye is abnormally high; whereas in uveitis the pain is moderate, the cornea is clear, and the fluid pressure is normal or possibly lower or slightly above normal. The doctor may also use the slit lamp and another lens to examine the back of the eye to get a good look at the retina and choroid. Other instruments, such as a hand-held ophthalmoscope or a binocular indirect ophthalmoscope, can be used to examine the back of the eye. There should be no discomfort with these tests except if the patient is sensitive to the bright light.

Laboratory testing

Laboratory testing is used to rule out conjunctivitis in some patients. The doctor wipes the inside of the patient's eyelid with a swab in order to obtain a sample for testing. Although blood tests are not necessary to diagnose uveitis by itself, they are used to diagnose the cause if the doctor suspects that toxoplasmosis or another systemic disease is responsible for the uveitis.

Treatment

Uveitis is generally treated by an ophthalmologist because therapy requires topical and oral medications, however, some optometrists (O.D.) are state licensed to use therapeutic medications. Other doctors may be involved in treating the underlying disease, if the patient has one, and in monitoring the patient's responses to medications.

Anterior uveitis is treated with corticosteroid drops; in severe cases, the patient may be given steroid injections in the area of the eye or oral steroids. Atropine sulfate drops may be given to dilate the patient's pupil. Posterior uveitis is treated with systemic **corticosteroids**. It is usually not necessary to dilate the pupil.

Prolonged steroid use may increase intraocular pressure, thereby increasing the risk of glaucoma. Steroid use has also been connected to cataract formation. Patients should be monitored closely and frequently.

Prognosis

The prognosis depends upon the location of the uveitis, on whether it is chronic or acute, and on the promptness of treatment. The prognosis for untreated uveitis is poor. Untreated anterior uveitis usually pro-

gresses to posterior uveitis, resulting in **cataracts**, scar tissue, and eventual glaucoma. If treated promptly, anterior uveitis usually clears up in several days or weeks, but is likely to recur. Posterior uveitis usually results in some permanent loss or blurring of vision.

Prevention

Patients with anterior uveitis should be warned about the possibility of recurrence and instructed about its symptoms, especially inflammation of the iris. They should be advised to seek treatment at once at the first signs of recurrence.

Resources

BOOKS

Eisenbaum, Allan M. "Eye." In *Current Pediatric Diagnosis & Treatment*, ed. William W. Hay Jr., et al. Stamford: Appleton & Lange, 1997.

"Ophthalmologic Disorders: Uveal Tract; Uveitis." In *The Merck Manual of Diagnosis and Therapy*. 16th ed. Ed. Robert Berkow. Rahway, NJ: Merck Research Laboratories, 1992.

Riordan-Eva, Paul, et al. "Eye." In *Current Medical Diagnosis and Treatment*, 1998. 37th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1997.

Illustrated Guide to Diagnostic Tests. Ed. J. A. Lewis. Springhouse, PA: Springhouse Corp. 1994.

"Uveitis." In *Professional Guide to Diseases*, ed. Stanley Loeb, et al. Springhouse, PA: Springhouse Corporation, 1991.

ORGANIZATIONS

American Academy of Ophthalmology. 655 Beach Street, P.O. Box 7424, San Francisco, CA 94120-7424. <<http://www.eyenet.org>>.

American Optometric Association. 243 North Lindbergh Blvd., St. Louis, MO 63141. (314) 991-4100. <<http://www.aoanet.org>>.

V

Vaccination

Definition

Vaccination is the use of vaccines to prevent specific diseases.

Purpose

Many diseases that once caused widespread illness, disability, and **death** now can be prevented through the use of vaccines. Vaccines are medicines that contain weakened or dead bacteria or viruses. When a person takes a vaccine, his or her immune system responds by producing antibodies—substances that weaken or destroy disease-causing organisms. When the person is later exposed to live bacteria or viruses of the same kind that were in the vaccine, the antibodies prevent those organisms from making the person sick. Vaccines usually also stimulate the so-called cellular immune system as well. In other words, the person becomes immune to the disease the organisms normally cause. The process of building up immunity by taking a vaccine is called immunization.

Vaccines are used in several ways. Some, such as the **rabies** vaccine, are given only when a person is likely to have been exposed to the virus that causes the disease—through a dog bite, for example. Others are given to travelers planning to visit countries where certain diseases are common such as **typhoid fever** or **yellow fever**. Vaccines such as the **influenza** vaccine, or “flu shot,” are given mainly to specific groups of people—older adults and others who are at high risk of developing influenza or its complications. Then, there are vaccines that are given to almost everyone, such as the ones that prevent **diphtheria**, **tetanus**, **polio** and **measles**.

Children routinely have a series of vaccinations that begins at birth. Given according to a specific schedule, these vaccinations protect against **hepatitis B**, diphtheria, tetanus, pertussis (**whooping cough**), measles, **mumps**, **rubella** (German measles), varicella (**chicken-**

pox), polio, pneumococcus and *Haemophilus influenzae* type b (Hib disease, a major cause of spinal **meningitis**) and, in some states, **hepatitis A**. This series of vaccinations is recommended by the American Academy of Family Physicians, the American Academy of Pediatrics, and the Centers for Disease Control and Prevention and is required in all states before children can enter school. All states will make exceptions for children who have medical conditions such as **cancer** that prevent them from having vaccinations, and some states also will make exceptions for children whose parents object for religious or other reasons.

Description

In addition to those discussed above, vaccines are available for preventing **anthrax**, **cholera**, hepatitis A, **Japanese encephalitis**, meningococcal meningitis, **plague**, pneumococcal infection (meningitis, **pneumonia**), **tuberculosis**, typhoid **fever**, and yellow fever. Most vaccines are given as injections, but a few are given by mouth.

Some vaccines are combined in one injection, such as the measles-mumps-rubella (MMR) or diphtheria-pertussis-tetanus (DPT) combinations.

Recommended dosage

The recommended dosage depends on the type of vaccine and may be different for different patients. The healthcare professional who gives the vaccine will decide on the proper dose.

A vaccination health record will help parents and health care providers keep track of a child’s vaccinations. The record should be started when the child has his or her first vaccination and should be updated with each additional vaccination. While most physicians follow the recommended vaccination schedule, parents should understand that some flexibility is allowed. For example, vaccinations that are scheduled for age two months may be given anytime between six to 10 weeks. When possi-



An allergic reaction to a vaccination shot. (Photograph by Lester V. Bergman, Corbis Images. Reproduced by permission.)

ble, follow the schedule. However, slight departures will not prevent the child from developing immunity, as long as all the vaccinations are given at around the right times. The child's physician is the best person to decide when each vaccination should be given.

Anyone planning a trip to another country should check to find out what vaccinations are needed. Some vaccinations must be given as much as 12 weeks before the trip, so getting this information early is important. Many major hospitals and medical centers have travel clinics that can provide this information. The Traveler's Health Section of the Centers for Disease Control and Prevention also has information on vaccination requirements.

Precautions

Vaccines are not always effective, and there is no way to predict whether a vaccine will "take" in any particular person. To be most effective, vaccination programs depend on whole communities participating. The more people who are vaccinated, the lower everyone's risk of being exposed to a disease. Even people who do not develop immunity through vaccination are safer when their friends, neighbors, children, and coworkers are immunized.

Like most medical procedures, vaccination has risks as well as substantial benefits. Anyone who takes a vaccine should make sure he or she is fully informed about both the benefits and the risks. Any questions or

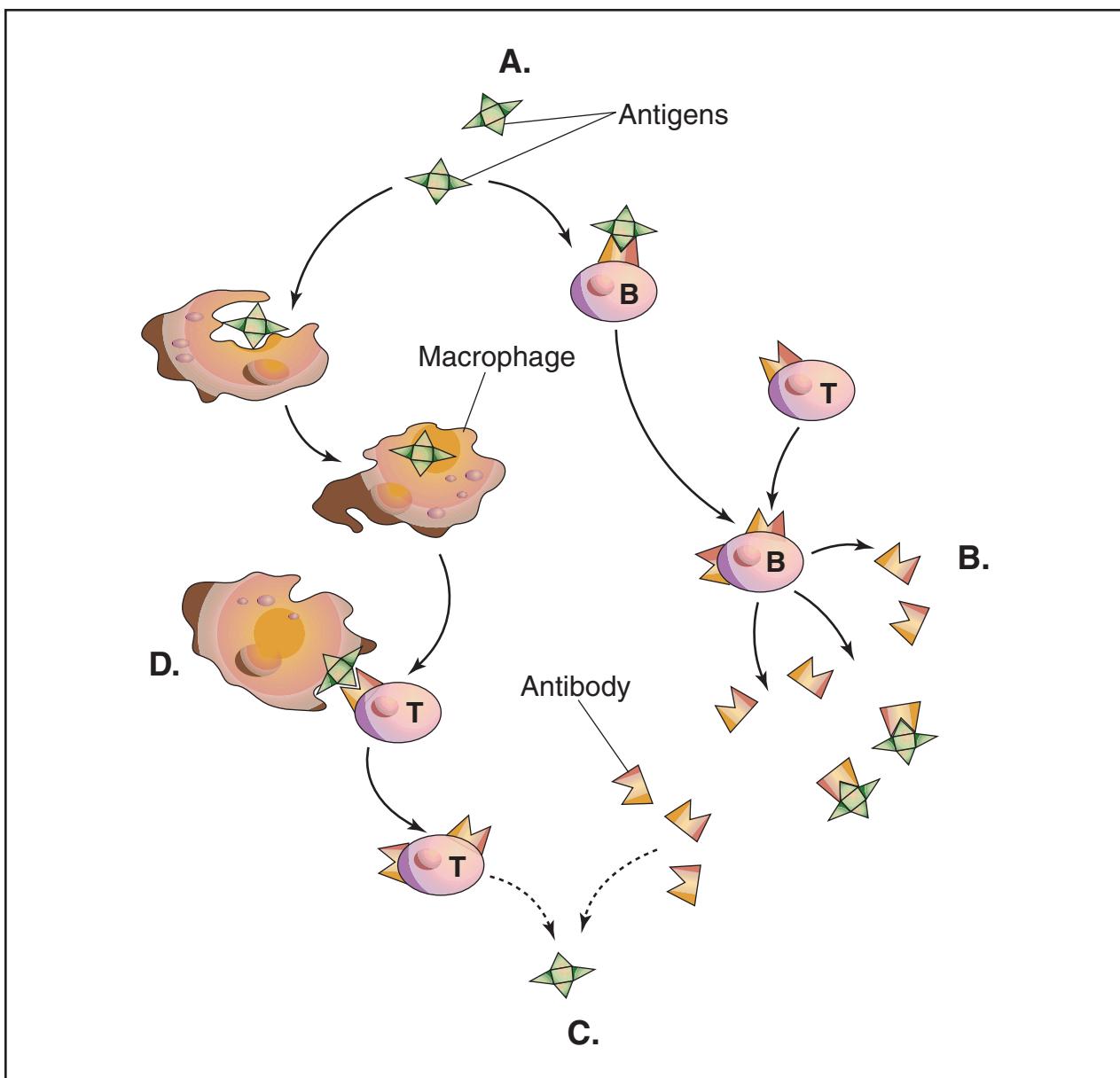
Recommended Immunization Schedule

Age	Vaccine
0–2 months	Hepatitis B
1–4 months	Hepatitis B
2 months	DTP (diphtheria-tetanus-pertussis) Hib (Haemophilus influenzae type B) Polio
4 months	DTP Hib
6 months	Polio DTP Hib
6–18 months	Hepatitis B Polio Hib
12–15 months	MMR (measles-mumps-rubella) Varicella (chickenpox)
12–18 months	DTP
15–18 months	DTP
4–6 years	Polio MMR
11–12 years	Hepatitis B (if not already completed) MMR (if not already completed) Varicella (if not already completed)
11–16 years	DT (diphtheria-tetanus booster shot; and then booster shot every 10 to 15 years)

concerns should be discussed with a physician or other health care provider. The Centers for Disease Control and Prevention, located in Atlanta, Georgia, also is a good source of information.

Vaccines may cause problems for people with certain **allergies**. For example, people who are allergic to the **antibiotics** neomycin or polymyxin B should not take rubella vaccine, measles vaccine, mumps vaccine or the combined measles-mumps-rubella (MMR) vaccine. Anyone who has had a severe allergic reaction to baker's yeast should not take the hepatitis B vaccine. Patients who are allergic to antibiotics such as gentamicin sulfate, streptomycin sulfate or other **aminoglycosides** should check with their physicians before taking influenza vaccine, as some influenza vaccines contain small amounts of these drugs. Also, some vaccines, including those for influenza, measles and mumps, are grown in the fluids of chick embryos and should not be taken by people who are allergic to eggs. In general, anyone who has had an unusual reactions to a vaccine in the past should let his or her physician know before taking the same kind of vaccine again. The physician also should be told about any allergies to foods, medicines, preservatives, or other substances.

People with certain other medical conditions should be cautious about taking vaccines. Influenza vaccine, for example, may reactivate **Guillain-Barré syndrome** (GBS) in people who have had it before. This vaccine



How vaccines work: A. Vaccines contain antigens (weakened or dead viruses, bacteria, and fungi that cause disease and infection). When introduced into the body, the antigens stimulate the immune system response by instructing B cells to produce antibodies, with assistance from T-cells. B. The antibodies are produced to fight the weakened or dead viruses in the vaccine. C. The antibodies “practice” on the weakened viruses, preparing the immune system to destroy real and stronger viruses in the future. D. When new antigens enter the body, white blood cells called macrophages engulf them, process the information contained in the antigens, and send it to the T-cells so that an immune system response can be mobilized. (Illustration by Electronic Illustrators Group.)

also may worsen illnesses that involve the lungs, such as **bronchitis** or pneumonia. Vaccines that cause fever as a side effect may trigger seizures in people who have a history of seizures caused by fever.

Certain vaccines are not recommended for use during **pregnancy**, but some may be given to women at especially high risk of getting a specific disease such as

polio. Vaccines also may be given to pregnant women to prevent medical problems in their babies. For example, vaccinating a pregnant woman with tetanus toxoid can prevent her baby from getting tetanus at birth.

Women should avoid becoming pregnant for three months after taking rubella vaccine, measles vaccine, mumps vaccine or the combined measles-mumps-rubella

KEY TERMS

Anthrax—An infectious disease caused by a type of bacterium. The disease can be passed from animals to people and usually is fatal. Symptoms include sores on the skin.

Antibody—A type of protein produced in the blood or in the body tissues that helps the body fight infection.

Bacteria—Tiny, one-celled forms of life that cause many diseases and infections.

Cholera—An infection of the small intestine caused by a type of bacterium. The disease is spread by drinking water or eating seafood or other foods that have been contaminated with the feces of infected people. It occurs in parts of Asia, Africa, Latin America, India, and the Middle East. Symptoms include watery diarrhea and exhaustion.

Encephalitis—Inflammation of the brain, usually caused by a virus. The inflammation may interfere with normal brain function and may cause seizures, sleepiness, confusion, personality changes, weakness in one or more parts of the body, and even coma.

Feces—(Also called stool.) The solid waste that is left after food is digested. Feces form in the intestines and pass out of the body through the anus.

Guillain-Barré syndrome (GBS)—A disease of the nerves with symptoms that include sudden numbness and weakness in the arms and legs, sometimes leading to paralysis. The disease is serious and requires medical treatment, but most people recover completely.

Immune system—The body's natural defenses against disease and infection.

Immunization—A process or procedure that pro-

tects the body against an infectious disease. A vaccination is a type of immunization.

Inflammation—Pain, redness, swelling, and heat that usually develop in response to injury or illness.

Meningitis—Inflammation of tissues that surround the brain and spinal cord.

Microorganism—An organism that is too small to be seen with the naked eye.

Organism—An individual of some type of life form, such as a plant, an animal, or a microorganism.

Plague—A highly infectious disease that can be fatal if not treated promptly. The bacteria that cause plague mainly infect rats, mice, squirrels, and other wild rodents. The disease is passed to people through fleas. Infected people can then spread the disease to other people.

Seizure—A sudden attack, spasm, or convulsion.

Tuberculosis—An infectious disease that usually affects the lungs, but may also affect other parts of the body. Symptoms include fever, weight loss, and coughing up blood.

Typhoid fever—An infectious disease caused by a type of bacterium. People with this disease have a lingering fever and feel depressed and exhausted. Diarrhea and rose-colored spots on the chest and abdomen are other symptoms. The disease is spread through poor sanitation.

Virus—A tiny, disease-causing particle that can reproduce only in living cells.

Yellow fever—An infectious disease caused by a virus. The disease, which is spread by mosquitoes, is most common in Central and South America and Central Africa. Symptoms include high fever, jaundice (yellow eyes and skin) and dark-colored vomit, a sign of internal bleeding. Yellow fever can be fatal.

(MMR) as these vaccines could cause problems in the unborn baby.

Women who are breastfeeding should check with their physicians before taking any vaccine.

Side effects

Most side effects from vaccines are minor and easily treated. The most common are **pain**, redness, and swelling at the site of the injection. Some people may also develop

a fever or a rash. In rare cases, vaccines may cause severe allergic reactions, swelling of the brain, or seizures. Anyone who has an unusual reaction after receiving a vaccine should get in touch with a physician right away.

Interactions

Vaccines may interact with other medicines and medical treatments. When this happens, the effects of the vaccine or the other medicine may change or the risk of side

effects may be greater. For example, **radiation therapy** and cancer drugs may reduce the effectiveness of many vaccines or may increase the chance of side effects. Any-one who takes a vaccine should let the physician know all other medicines he or she is taking and should ask whether the possible interactions could interfere with the effects of the vaccine or the other medicines.

Resources

PERIODICALS

- Doheny, Kathleen. "Vaccinations Are for Big People Too: Adults Should Consider Asking Their Doctors about Hepatitis B and Other Ailments." *Vibrant Life* 11 (September-October 1995): 15.
- Gindler, Jacqueline, et al. "Immunization—Effective at All Ages." *Patient Care* 29 (May 15, 1995): 119.
- McCall, Timothy. "Should You Get a Flu Shot?" *American Health* 15 (September 1996): 23.

OTHER

- Centers for Disease Control National Immunization Program. <<http://www.cdc.gov/nip>>.
- National Immunization Information Hotline. Centers for Disease Control and Prevention. (800) 232-2522.

Larry I. Lutwick, MD

Vaccines see **Vaccination**

Vaginal pain

Definition

Pain in the vaginal canal is usually associated with an underlying medical and/or psychological condition.

Description

Vaginal pain is experienced usually during vaginal manipulation or sexual intercourse. Approximately 50–85% of the causes are due to organic (medical) conditions. However, it is typical for the medical condition to be compounded by psychological issues such as depression and problems associated with sexual identity. The primary entity concerns dyspareunia, a vaginal pain experienced during sexual intercourse. The vagina has three physiological functions: an outflow duct for menstrual discharge, to receive the penis during sexual intercourse, and as the birthing canal. The overall prevalence for dyspareunia is 20% (15% of women and 57% of men). A significant percentage of **breast cancer** and **hysterectomy** patients demonstrated **sexual dysfunction**.

KEY TERMS

Laposcopic surgery—A surgical procedure to correct or diagnose an underlying disease.

Causes and symptoms

The causes can be categorized as organic, due to a medical condition and/or psychological difficulties. Medical conditions can include chronic diseases, minor ailments, **breast cancer**, and medications. Psychological cause can be related to physical or sexual **abuse**. **Pregnancy** and hormonal changes (decreased estrogen) have significant negative impact on sexual activity, desire, and satisfaction. Dyspareunia can be divided into three types of pain: superficial, vaginal, and deep. Superficial pain is associated with attempted penetration. This is usually caused by changes in anatomy, irritative condition, or vaginismus. Vaginal pain is associated with friction, indicating a problem with lubrication and /or arousal disorders. Deep pain is related to thrusting and is indicative of pelvic disease or an inability for **pelvic relaxation**.

Diagnosis

The diagnosis must be pursued with diligence and in a comprehensive manner. A careful history and **physical examination** is essential. Procedures that can be used include surgical investigation (**laparoscopy**) and treatment of the underlying cause(s).

Treatment

Treatment is directed at diagnosing the underlying condition, which can be medical and/or psychological cause(s). Treatment can include surgery, hormonal therapy (replacements), psychotherapy, and pain control protocols.

Prognosis

The prognosis depends on the primary cause. If treatment is aggressively pursued and patient compliance is satisfactory the overall outcome is favorable.

Prevention

There are no precise preventive measures since the condition can result from normal **aging** and/or progressively worsening psychological disease.

Resources

BOOKS

- Ryan, Kenneth J., et al, eds. *Kisner's Gynecology & Women's Health*. 7th ed. Mosby, Inc., 1999.

Goroll, Allan H., et al. *Primary Care Medicine*. 4th ed. Lippincott, Williams & Wilkins, 2000.
 Tasman, Allan, et al eds. *Psychiatry*. 1st ed. W. B. Saunders Company, 1997.

ORGANIZATION

The American College of Obstetricians and Gynecologists. 409 12th St., S.W., PO Box 96920, Washington, D.C., 20090-6920.

Laith Farid Gulli, M.D.
 Kathleen Berrisford, MSW, CSW

Vaginal warts see **Genital warts**

Vaginitis see **Vulvovaginitis**

Vagotomy

Definition

Vagotomy is the surgical cutting of the vagus nerve to reduce acid secretion in the stomach.

Purpose

The vagus nerve splits into branches that go to different parts of the stomach. Stimulation from these branches causes the stomach to produce acid. Too much stomach acid leads to ulcers that may eventually bleed and create an emergency situation.

Vagotomy is performed when acid production in the stomach can not be reduced by other means. It is used when ulcers in the stomach and duodenum do not respond to medication and changes in diet. It is an appropriate surgery when there are ulcer complications, such as obstruction of digestive flow, bleeding, or perforation. The frequency with which elective vagotomy is performed has decreased in the past 20 years as drugs have become increasingly effective in treating ulcers. However, the number of vagotomies performed in emergency situations has remained about the same.

Vagotomy is often performed in conjunction with other gastrointestinal surgery, such as partial removal of the stomach (antrectomy or subtotal **gastrectomy**). There are several types of vagotomies. Truncal vagotomy severs the trunk of the vagus nerve as it enters the abdomen. Parietal cell or proximal gastric vagotomy leaves the trunk intact, but severs the branches that go to different parts of the stomach.

Precautions

Patients who receive vagotomies are most often seen in emergency situations where bleeding and perforated

ulcers make it necessary to act immediately. As with any major surgery, people who use alcohol excessively, smoke, are obese, and are very young or very old are at higher risks for complications.

Description

Vagotomy is performed under general anesthesia by a surgeon in a hospital. The surgeon makes an incision in the abdomen and locates the vagus nerve. Either the trunk or the branches leading to the stomach are cut. Then the abdominal muscles are sewn back together, and the skin is closed with sutures.

Often, other gastrointestinal surgery is performed at the same time as the vagotomy. Part of the stomach may be removed, for instance. Vagotomy causes a decrease in peristalsis and a change in the emptying patterns of the stomach. To ease this, a **pyloroplasty** is often performed. This procedure widens the outlet from the stomach to the small intestine.

Preparation

A gastroscopy and x rays of the gastrointestinal system are performed as diagnostic procedures to determine the position and condition of the ulcer. Standard preoperative blood and urine tests are done. The patient should discuss with the anesthesiologist any medications or conditions that might affect the administration of anesthesia.

Aftercare

Patients who have had a vagotomy stay in the hospital for about seven days. For the first three or four days, nasogastric suctioning is required. A tube is inserted through the nose and into the stomach. The stomach contents are then suctioned out. Patients eat a clear liquid diet until the gastrointestinal tract is functioning again. When patients return to a regular diet, spicy and acidic food should be avoided.

It takes about six weeks to fully recover from the surgery. The sutures that close the skin can be removed in seven to ten days. Patients are encouraged to move around soon after the operation to prevent the formation of deep vein blood clots. **Pain** medication, stool softeners, and **antibiotics** may be prescribed following the operation.

Risks

As with all surgery, excessive bleeding and infection are possible complications. In addition, the emptying patterns of the stomach are changed. This can lead to dumping syndrome and **diarrhea**. Dumping syndrome is a condition where shortly after eating, the patient experi-

ences **palpitations**, sweating, nausea, cramps, vomiting, and diarrhea.

Normal results

Normal recovery is expected for most patients. In about 10% of those who have vagotomy without stomach removal, ulcers recur. Two to three percent of patients who have some portion of their stomach removed also have recurrent ulcers.

Resources

BOOKS

"Stomach and Duodenum." In *Current Surgical Diagnosis and Treatment*. 10th ed. Ed. Lawrence W. Way. Stamford: Appleton & Lange, 1994.

Tish Davidson

Valacyclovir see **Antiviral drugs**

Valley fever see **Coccidioidomycosis**

KEY TERMS

Atria—The heart has four chambers. The right and left atria are at the top of the heart and receive returning blood from the veins. The right and left ventricles are at the bottom of the heart and act as the body's main pumps.

Echocardiography—An ultrasound test that shows the size, shape, and movement of the heart.

to respond by correcting its rhythm and beating more slowly. On rare occasions, the Valsalva maneuver can be used to diminish chest pain in patients with mild coronary disease.

Unrelated to any evaluation of the heart, the Valsalva maneuver is also taught to patients with **multiple sclerosis** who are unable to fully empty the bladder (flaccid bladder). It is sometimes used in sexual therapy to help men avoid **premature ejaculation**.

Precautions

The Valsalva maneuver should not be performed on patients who have severe **coronary artery disease**, have experienced recent **heart attack**, or where there is a moderate to severe reduction in blood volume.

Description

When performed formally, the patient is asked to blow against an aneroid pressure measuring device (manometer) and maintain a pressure of 40 millimeters of mercury (mm Hg) for 30 seconds. Or, less formally, the patient may be asked to bear down, as if having a bowel movement. During this 30 second period, a recording is made of the changes in blood pressure and murmurs of the heart.

Preparation

The patient may be connected to a heart monitor and echocardiograph or the physician may simply use a stethoscope to monitor the heart. Sometimes an indwelling needle is inserted for accurate pressure measurements, depending on whether the procedure is being done for corrective or diagnostic purposes.

Aftercare

When this procedure is done to regulate irregular heart rhythms, the patient usually remains on a heart monitor to evaluate heartbeat.

Risks

The patient may feel dizzy or faint during the procedure, but serious consequences are rare. There is a risk that the Valsalva maneuver can cause blood clots to detach, bleeding, and abnormal rhythms originating in the ventricle. It can also cause cardiac arrest. Consequently, the procedure is usually performed in a setting where emergency equipment is accessible.

Normal results

There are four characteristic changes or phases in a normal heart's response to the Valsalva maneuver. An abnormality in any of these phases indicates a cardiovascular abnormality.

Resources

BOOKS

- Braunwald, Eugene, ed. *Heart Disease: A Textbook of Cardiovascular Medicine*. Philadelphia: W. B. Saunders Co., 1997.
 "Valsalva's Maneuver." In *Everything You Need to Know About Medical Treatments*. Springhouse, PA: Springhouse Corp., 1996.

Tish Davidson

Valvular heart disease

Definition

Valvular heart disease refers to several disorders and diseases of the heart valves, which are the tissue flaps that regulate the flow of blood through the four chambers of the heart.

Description

The human heart consists of four chambers—two upper chambers (the atria) and two lower chambers (the ventricles)—that are responsible for pumping blood. The heart valves are like one-way doors, which open and close with each beat of the heart, controlling the blood flow from one chamber to the next. Each of these valves is made up of a few thin folds of tissue. When functioning correctly, they keep blood from flowing backwards into a chamber when closed.

The four valves function in the following manner:

- The mitral valve is located between the left atrium and the left ventricle. It is the only valve with two flaps, or cusps.

- The tricuspid valve is located on the right side of the heart, between the right atrium and right ventricle. It is made up of three cusps, each a different size.
- The aortic valve is located on the left side of the heart and opens to allow blood to leave the heart from the left ventricle into the aorta, which is the main artery of the body. It closes to prevent blood from flowing back into the left ventricle.
- The pulmonary valve is situated on the right side of the heart, between the right ventricle and pulmonary artery. It allows blood to exit the heart and enter the lungs via the pulmonary artery. It closes to prevent blood from flowing back into the right ventricle.

Patients with valvular heart disease have a malfunction of one or more of these valves. There are several types of valvular heart diseases with distinct symptoms and treatments. These are:

- mitral valve prolapse (displacement)
- mitral valve insufficiency (regurgitation)
- mitral valve stenosis (narrowing)
- aortic valve insufficiency
- aortic valve stenosis
- tricuspid valve insufficiency
- tricuspid valve stenosis
- pulmonic stenosis
- pulmonic insufficiency

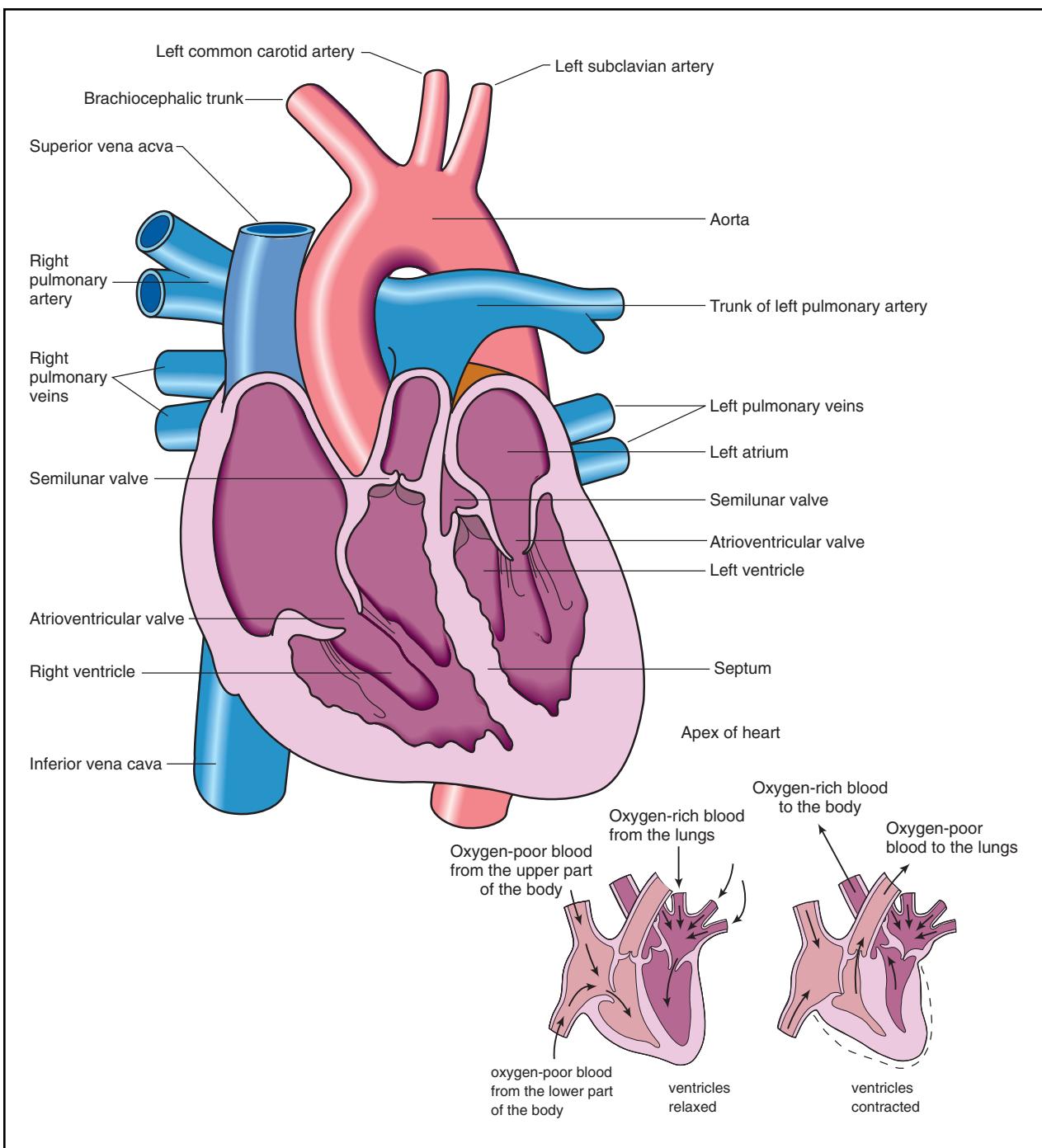
Certain types of heart disease can lead to one of the specific conditions listed above. These include **rheumatic fever** and infective inflammation of the heart (**endocarditis**). Multivalvular heart disease refers to a condition involving more than one of the heart valves.

Causes and symptoms

Problems with heart valves may occur as a result of infection, degeneration, or congenital abnormality. The most common infections are **rheumatic fever** and **infective endocarditis**.

Rheumatic fever

Rheumatic fever is a condition that results from the body's immune response to certain types of streptococcal bacteria. It occurs rarely. When it does occur, it is most often in children who have had **strep throat** that was not completely treated. The symptoms of rheumatic fever include heart inflammation, uncontrolled movement of limbs and face, arthritis that moves from joint to joint, **shortness of breath**, weakness, and either lumps under the skin or raised red patches on the skin. The most common valvular heart diseases to result from rheumatic fever



Anatomy of the human heart. The illustration at the bottom right shows how the right and left ventricles contract and relax when blood is pumped through the heart. (Illustration by Hans & Cassady, Inc.)

are mitral stenosis, tricuspid stenosis, aortic insufficiency, aortic stenosis, multivalvular involvement, and less commonly, pulmonic stenosis. Chronic rheumatic heart disease can result from one occurrence or from repeated attacks. It is not as common as it once was in the United States, but still occurs frequently in developing countries.

Infective endocarditis

Infective endocarditis is an infection and inflammation of the inner layer, or membrane, of heart tissue (endocardium). Most people with a healthy, normal heart are not at significant risk for contracting infective endocarditis. However, people who have had rheumatic fever, with its

resulting scarring, or a congenital cause of heart malformation, may contract this disease when certain bacteria enter the bloodstream and become lodged in the heart. In particular, dental surgery or any surgery involving the mouth, bladder, prostate, or female pelvic organs increases risk for this infection. The disease may also occur in drug addicts who inject their veins using unsterilized needles, even if they have normal heart valves. Symptoms of infective endocarditis include fever, a new or changing heart murmur, and abnormal loss of appetite or **fatigue**.

The use of appetite suppressants

In 1997 and early 1998, research was underway to determine if fen-phen, the abbreviation for a combination of the two weight-loss drugs fenfluramine and phentermine, caused heart valve problems in some patients. Physicians were concerned that this drug combination could affect the heart valves because the drugs alter metabolism of serotonin in the body. Serotonin is a natural substance found in the brain and intestines that can affect blood vessels. Until the issue could be studied more, physicians recommended that patients taper off the drugs, finally stopping them altogether. The drug's manufacturer removed fenfluramine from the market until further study was conducted.

Other valvular heart disease

The mitral and aortic valves may also be affected by deposits of calcium in the heart that occurs with **aging**. This can lead to thickening and leakage of heart valves. Heart attacks can also damage the mitral valve structures. Additionally, certain connective tissue disorders can adversely affect the heart valves, for example, Marfan's syndrome and myxomatous degeneration.

Diagnosis

Specific types of valvular heart disease are diagnosed using **electrocardiography (EKG)**, **echocardiography**, certain x-ray studies, and/or **cardiac catheterization**. An EKG provides a record of electrical changes in the heart muscle during the heartbeat. Echocardiography uses sound waves to make images of the heart. These images can show if there are any abnormalities of the heart valves. Cardiac catheterization is a procedure in which a small tube (called a catheter) is inserted into an artery and passed into the heart. It is used to measure pressure in the heart and the amount of blood pumped by the heart.

Rheumatic fever

Rheumatic fever may be suspected when a recent throat infection has occurred and other major or minor symptoms appear, such as joint ache, abnormal EKG, or

a blood test indicating heart inflammation. **Heart murmurs** may be detected from routine examination.

Infective endocarditis

A diagnosis of infective endocarditis can be obtained through patient history, EKG, ultrasound, or cardiac catheterization. Patients who have developed the disease rapidly may report fever, fatigue, night sweats, chills, and joint inflammation. Those whose disease has developed more slowly will show signs of rapid heart rate, an enlarged spleen, various skin colors or spots, and heart murmur. The physician may order blood tests to determine what is causing the infection.

Appetite suppressants

People with a history of using appetite suppressants may be sent for EKGs or further testing if any of the symptoms of valvular heart disease, such as swelling, considerable fatigue, or shortness of breath occur.

Treatment

The treatment of specific valvular heart diseases will vary, depending on the valve involved and the extent of damage or malfunction. Some patients will not require treatment and many will be treated with medication. Sometimes, patients need surgery. If multivalvular disease is suspected or involved, different valves may be evaluated during surgery on one of the affected valves.

Rheumatic fever

Patients with rheumatic fever will be treated with **antibiotics** to eliminate streptococcal organisms that may still remain in the heart. Patients may receive antibiotics to prevent further infection, and inflammation may be treated with **aspirin** or cortisone-like drugs.

Infective endocarditis

Physicians will use the appropriate antibiotic or some combination of antibiotics to treat infective endocarditis, depending on the type of bacterium that caused the disease. Severe cases of this disease may be corrected by valve replacement surgery.

Appetite suppressants

The role of appetite suppressants (fen-phen) in valvular heart disease has been under study. As of 1998, these drugs were voluntarily removed from the market.

Prognosis

The prognosis for patients with valvular heart disease varies depending on the underlying cause, age and

health of the patient, and the degree of valvular damage or involvement.

Rheumatic fever

Patients with rheumatic heart disease face a lifetime of caution over contact with the same bacterium that caused the disease. Since it can cause inflammation of one or more organs or joints, complications can occur. The inflammation of the heart may subside without side effects. Permanent scarring of one or more heart valves is a possibility and may require surgery to repair or replace damaged valves. In severe cases, rheumatic fever can lead to **death from heart failure**.

Infective endocarditis

The prognosis for patients with infective endocarditis depends on the underlying heart disease and resulting complications. If the disease further damages heart valves, symptoms may occur for years after initial treatment. Sometimes, endocarditis can result in heart or renal failure. If untreated, it can be fatal.

Appetite suppressants

As of early 1998, prognosis for patients with valvular heart disease resulting from the use of certain appetite suppressants was still under study. Since it is believed that different valves may be affected, treatment would most likely follow a similar course as that for the specific valvular disease.

Prevention

Certain measures can be taken to prevent some valvular disease. However, once valvular heart disease that results from congenital abnormality occurs, it may not be prevented. Steps can be taken to prevent further complications.

Rheumatic fever

The best prevention for rheumatic fever is prompt and thorough treatment of any suspected streptococcal infection, particularly strep throat in children. A physician should check any **sore throat** with fever that persists for more than 24 hours. The physician will probably order a **throat culture**. Completion of the antibiotic treatment even after symptoms diminish is important to be certain the infection is eliminated.

Infective endocarditis

Anyone who was born with a defective heart valve, those with artificial (prosthetic) valves, or those who

KEY TERMS

Congenital—Used to describe a condition or defect present at birth.

Stenosis—An abnormal valve condition which is characterized by tightening or narrowing of the opening.

Streptococcal (Streptococcus)—*Streptococcus* is a bacterium that causes infection in people. Its most commonly known strain causes the infection strep throat.

Throat culture—A test for strep throat that involves swabbing the back of the throat and sending the swab to a laboratory, which will determine whether bacteria is present.

have had a valve scarred by rheumatic fever, should use prescribed antibiotics by mouth before and after a dental procedure. These patients may also need to receive injected antibiotics prior to procedures involving the bladder, prostate, and pelvic organs.

Appetite suppressants

The drug associated with valvular heart disease, fenfluramine, was not available on the market as of mid-1998.

Resources

BOOKS

Current Medical Diagnosis and Treatment, 1996. 35th ed. Ed. Stephen McPhee, et al. Stamford: Appleton & Lange, 1995.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX

75231. (214) 373-6300. <<http://www.americanheart.org>>.

National Heart, Lung and Blood Institute. P.O. Box 30105,

Bethesda, MD 20824-0105. (301) 251-1222. <<http://www.nhlbi.nih.gov>>.

OTHER

Mayo Clinic Online. 5 Mar. 1998 <<http://www.mayohealth.org>>.

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Valvuloplasty see **Heart valve repair**

Varicella see **Chickenpox**

Varicocele removal see **Testicular surgery**

Varicose veins

Definition

Varicose veins are dilated, tortuous, elongated superficial veins that are usually seen in the legs.

Description

Varicose veins, also called varicosities, are seen most often in the legs, although they can be found in other parts of the body. Most often, they appear as lumpy, winding vessels just below the surface of the skin. There are three types of veins, superficial veins that are just beneath the surface of the skin, deep veins that are large blood vessels found deep inside muscles, and perforator veins that connect the superficial veins to the deep veins. The superficial veins are the blood vessels most often affected by varicose veins and are the veins seen by eye when the varicose condition has developed.

The inside wall of veins have valves that open and close in response to the blood flow. When the left ventricle of the heart pushes blood out into the aorta, it produces the high pressure pulse of the heartbeat and pushes blood throughout the body. Between heartbeats, there is a period of low blood pressure. During the low pressure period, blood in the veins is affected by gravity and wants to flow downward. The valves in the veins prevent this from happening. Varicose veins start when one or more valves fail to close. The blood pressure in that section of vein increases, causing additional valves to fail. This allows blood to pool and stretch the veins, further weakening the walls of the veins. The walls of the affected veins lose their elasticity in response to increased blood pressure. As the vessels weaken, more and more valves are unable to close properly. The veins become larger and wider over time and begin to appear as lumpy, winding chains underneath the skin. Varicose veins can develop in the deep veins also. Varicose veins in the superficial veins are called primary varicosities, while varicose veins in the deep veins are called secondary varicosities.

Causes and symptoms

The predisposing causes of varicose veins are multiple, and lifestyle and hormonal factors play a role. Some families seem to have a higher incidence of varicose veins, indicating that there may be a genetic component to this disease. Varicose veins are progressive; as one section of the veins weakens, it causes increased pressure on adjacent sections of veins. These sections often develop varicosities. Varicose veins can appear following **pregnancy**, **thrombophlebitis**, congenital blood vessel



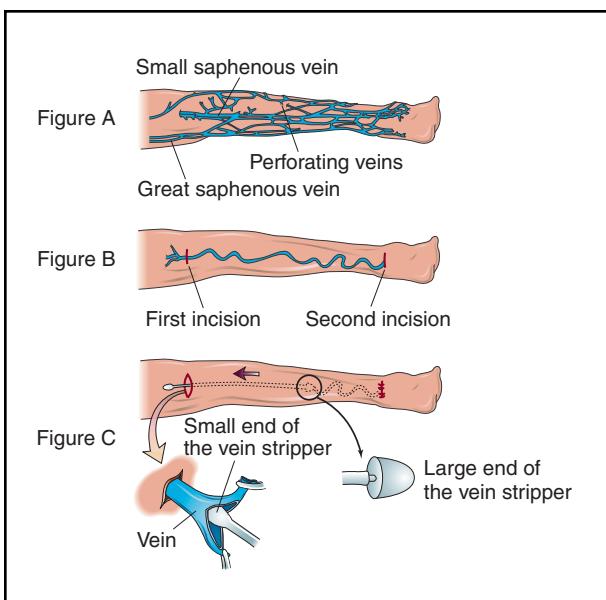
Varicose veins on a man's leg. (Custom Medical Stock Photo. Reproduced by permission.)

weakness, or **obesity**, but is not limited to these conditions. **Edema** of the surrounding tissue, ankles, and calves, is not usually a complication of primary (superficial) varicose veins and, when seen, usually indicates that the deep veins may have varicosities or clots.

Varicose veins are a common problem; approximately 15% of the adult population in the United States have varicose veins. Women have a much higher incidence of this disease than men. The symptoms can include aching, **pain**, itchiness, or burning sensations, especially when standing. In some cases, with chronically bad veins, there may be a brownish discoloration of the skin or **ulcers** (open sores) near the ankles. A condition that is frequently associated with varicose veins is spider-burst veins. Spider-burst veins are very small veins that are enlarged. They may be caused by back-pressure from varicose veins, but can be caused by other factors. They are frequently associated with pregnancy and there may be hormonal factors associated with their development. They are primarily of cosmetic concern and do not present any medical concerns.

Diagnosis

Varicose veins can usually be seen. In cases where varicose veins are suspected, but can not be seen, a physician may frequently detect them by palpation (pressing with the fingers). X rays or ultrasound tests can detect varicose veins in the deep and perforator veins and rule out blood clots in the deep veins.



Varicose veins may be surgically removed from the body when they are causing pain and when hemorrhaging or recurrent thrombosis appear. Surgery involves making an incision through the skin at both ends of the section of vein being removed (figure B). A flexible wire is inserted through one end and extended to the other. The wire is then withdrawn, pulling the vein out with it (figure C). (Illustration by Electronic Illustrators Group.)

Treatment

There is no cure for varicose veins. Treatment falls into two classes; relief of symptoms and removal of the affected veins. Symptom relief includes such measures as wearing support stockings, which compress the veins and hold them in place. This keeps the veins from stretching and limits pain. Other measures are sitting down, using a footstool when sitting, avoiding standing for long periods of time, and raising the legs whenever possible. These measures work by reducing the blood pressure in leg veins. Prolonged standing allows the blood to collect under high pressure in the varicose veins. **Exercise** such as walking, biking, and swimming, is beneficial. When the legs are active, the leg muscles help pump the blood in the veins. This limits the amount of blood that collects in the varicose veins and reduces some of the symptoms. These measures reduce symptoms, but do not stop the disease.

Surgery is used to remove varicose veins from the body. It is recommended for varicose veins that are causing pain or are very unsightly, and when hemorrhaging or recurrent thrombosis appear. Surgery involves making an incision through the skin at both ends of the section of vein being removed. A flexible wire is inserted through one end and extended to the other. The wire is then with-

KEY TERMS

Congenital—Existing at or before birth; a condition that developed while the fetus was in utero or as a consequence of the birth process.

Edema—Swelling caused by a collection of fluid in a tissue or body cavity.

Hemorrhage—Bleeding from blood vessels.

Palpation—The process of examining a patient by touch.

drawn, pulling the vein out with it. This is called “stripping” and is the most common method to remove superficial varicose veins. As long as the deeper veins are still functioning properly, a person can live without some of the superficial veins. Because of this, stripped varicose veins are not replaced.

Injection therapy is an alternate therapy used to seal varicose veins. This prevents blood from entering the sealed sections of the vein. The veins remain in the body, but no longer carry blood. This procedure can be performed on an out-patient basis and does not require anesthesia. It is frequently used if people develop more varicose veins after surgery to remove the larger varicose veins and to seal spider-burst veins for people concerned about cosmetic appearance. Injection therapy is also called sclerotherapy. At one time, a method of injection therapy was used that did not have a good success rate. Veins did not seal properly and blood clots formed. Modern injection therapy is improved and has a much higher success rate.

Prognosis

Untreated varicose veins become increasingly large and more obvious with time. Surgical stripping of varicose veins is successful for most patients. Most do not develop new, large varicose veins following surgery. Surgery does not decrease a person’s tendency to develop varicose veins. Varicose veins may develop in other locations after stripping.

Resources

BOOKS

Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill 1998.

Berkow, Robert, ed. *Merck Manual of Medical Information*.

Whitehouse Station, NJ: Merck Research Laboratories, 1997.

Larsen, D. E., ed. *Mayo Clinic Family Health Book*. New York: William Morrow and Co., Inc. 1996.

John T. Lohr, PhD

Variola see **Smallpox**

Vascular headache see **Migraine headache**

Vasculitis

Definition

Vasculitis refers to a varied group of disorders which all share a common underlying problem of inflammation of a blood vessel or blood vessels. The inflammation may affect any size blood vessel, anywhere in the body. It may affect either arteries and/or veins. The inflammation may be focal, meaning that it affects a single location within a vessel; or it may be widespread, with areas of inflammation scattered throughout a particular organ or tissue, or even affecting more than one organ system in the body.

Description

Inflammation is a process which occurs when the immune system of the body responds to either an injury or a foreign invader (virus, bacteria, or fungi). The immune system response involves sending a variety of cells and chemicals to the area in question. Inflammation causes blood vessels in the area to leak, causing swelling. The inflamed area becomes red, hot to the touch, and tender.

Antibodies are immune cells which recognize and bind to specific markers (called antigens) on other cells (including bacteria and viruses). These antibody-antigen complexes can then stimulate the immune system to send a variety of other cells and chemicals involved in inflammation to their specific location.

Some researchers believe that the damaging process of vasculitis is kicked off by such antibody-antigen complexes. These complexes are deposited along the walls of the blood vessels. The resulting inflow of immune cells and chemicals causes inflammation within the blood vessels.

The type of disease caused by vasculitis varies depending on a number of factors:

- the organ system or tissue in which the vasculitis occurs
- the specific type of inflammatory response provoked
- whether the affected vessels are veins (which bring blood to the heart) or arteries (which carry blood and oxygen from the heart to the organs and tissues)

- the degree to which blood flow within the affected vessel is reduced

Causes and symptoms

Some types of vasculitis appear to be due to a type of allergic response to a specific substance (for example, a drug). Other types of vasculitis have no identifiable initiating event. Furthermore, researchers have not been able to consistently identify antibody-antigen complexes in all of the types of diseases caused by vasculitis. The types of antigens responsible for the initial immune response have often gone unidentified as well. Furthermore, not all people with such complexes deposited along the blood vessels go on to develop vasculitis. Some researchers believe that, in addition to the presence of immune complexes, an individual must have some other characteristics which make him or her susceptible to vasculitis. Many questions have yet to be answered to totally explain the development of these diseases.

Symptoms

Symptoms of vasculitis depend on the severity of the inflammation and the organ system or systems affected. Some types of vasculitis are so mild that the only symptoms noted are small reddish-purple dots (called petechiae) on the skin due to tiny amounts of blood seeping out of leaky blood vessels. In more widespread types of vasculitis, the patient may have general symptoms of illness, including **fever**, achy muscles and joints, decreased appetite, weight loss, and loss of energy. The organ systems affected by vasculitis may include:

- The skin. **Rashes**, bumps under the skin, petechiae, larger reddish-purple circles (purpura), or bruising (ecchymoses) may appear. Areas of skin totally deprived of blood flow, and therefore of oxygen, may die, resulting in blackened areas of gangrene.
- The joints. In addition to joint **pain**, the joints themselves may become inflamed, resulting in arthritis.
- Brain and nervous system. Inflammation of the blood vessels in the brain can cause headaches, changes in personality, confusion, and seizures. If an area of the brain becomes totally deprived of oxygen, a **stroke** occurs. A stroke means that an area of brain tissue is either severely injured or completely dead from lack of oxygen. This may leave the individual with a permanent disability. If the vessels that lead to the eyes are affected, vision may become seriously disturbed. Nerves in the arms and legs may result in painful tingling sensations, loss of feeling, and weakness.
- Gastrointestinal system. Patients may have significant abdominal pain, vomiting, and **diarrhea**. If blood flow

is completely cut off to an area of intestine, that part of the intestine will die off. The liver may be affected.

- Heart. This is an extremely serious type of vasculitis. The arteries of the heart (coronary arteries) may develop weakened areas, called aneurysms. The heart muscle itself may become inflamed and enlarged. With oxygen deprivation of the heart muscle, the individual may suffer a heart attack.
- Lungs. The patient may experience **shortness of breath** with chest pain, and may **cough** up blood. There may be **wheezing**.
- Kidney. Changes in the arteries of the kidney may result in high blood pressure. The kidneys may become increasingly unable to appropriately filter the blood, and kidney failure may occur.

Specific diseases

Multiple types of disease are associated with vasculitis. Many autoimmune diseases have vasculitis as one of their complications. These include **systemic lupus erythematosus**, **rheumatoid arthritis**, **scleroderma**, and **polymyositis**. Other types of diseases which have vasculitis as their major manifestations include:

- Polyarteritis nodosa. This is an extremely serious, systemic (affecting systems throughout the body) form of vasculitis. Small and medium arteries are involved, and the inflammation is so severe that the walls of the arteries may be destroyed. Any organ system, or multiple organ systems, may be affected. The most serious effects include kidney failure, complications involving the heart, gastrointestinal problems, and high blood pressure.
- Kawasaki's disease is an acute disease which primarily strikes young children. Fever and skin manifestations occur in all patients. While most patients recover completely, a few patients suffer from vasculitis in the heart. This is frequently fatal.
- Henoch-Schonlein purpura. While this frequently occurs in children, adults may also be affected. This disease tends to affect the skin, joints, gastrointestinal tract, and kidneys.
- Serum sickness occurs when an individual reacts to a component of a drug, for example penicillin. Symptoms of this are often confined to the skin, although fevers, joint pain, and swelling of lymph nodes may also occur.
- Temporal arteritis (also called giant cell arteritis) tends to involve arteries which branch off the major artery that leads to the head, called the carotid. An artery which feeds tissues in the area of the temple (the temporal artery) is often affected. Severe headaches are



This person's legs are afflicted with leukocytoclastic vasculitis, a condition in which a blood or lymph vessel becomes inflamed. (Custom Medical Stock Photo. Reproduced by permission.)

the most classic symptom. Other symptoms include **fatigue**, loss of appetite and then weight, fever, heavy sweating, joint pain, and pain in the muscles of the neck, shoulders, and back. If the vasculitis includes arteries which supply the eye, serious visual disturbance or even blindness may result.

- Takayasu's arteritis affects the aorta (the very large main artery that exits the heart and receives all of the blood to be delivered throughout the body), and arteries which branch off of the aorta. Initial symptoms include fatigue, fever, sweating at night, joint pain, and loss of appetite and weight. Every organ may be affected by this disease. A common sign of this disease is the inability to feel the pulse in any of the usual locations (the pulse is the regular, rhythmic sensation one can feel with a finger over an artery, for example in the wrist, which represents the beating of the heart and the regular flow of blood).

KEY TERMS

Aneurysm—A weakened area in the wall of a blood vessel which causes an outpouching or bulge. Aneurysms may be fatal if these weak areas burst, resulting in uncontrollable bleeding.

Antibody—Specialized cells of the immune system which can recognize organisms that invade the body (such as bacteria, viruses, and fungi). The antibodies are then able to set off a complex chain of events designed to kill these foreign invaders.

Antigen—A special, identifying marker on the outside of cells.

Autoimmune disorder—A disorder in which the body's antibodies mistake the body's own tissues for foreign invaders. The immune system therefore attacks and causes damage to these tissues.

Immune system—The system of specialized organs, lymph nodes, and blood cells throughout the body which work together to prevent foreign invaders (bacteria, viruses, fungi, etc.) from taking hold and growing.

Inflammation—The body's response to tissue damage. Includes hotness, swelling, redness, and pain in the affected part.

Petechia—A tiny, purplish-red spot on the skin. Caused by the leakage of a bit of blood out of a vessel and under the skin.

Purpura—A large, purplish-red circle on the skin. Caused by the leakage of blood out of a vessel and under the skin.

- **Wegener's granulomatosis:** This disease exerts its most serious effects on the respiratory tract. The vasculitis produced by this disease includes the formation of fibrous, scarring nodules called granulomas. Symptoms include nose bleeds, ear infections, cough, shortness of breath, and chest pain. There may be bleeding in the lungs, and a patient may cough up blood. The kidneys, eyes, and skin are also frequently involved.

Diagnosis

Diagnosis of any type of vasculitis involves demonstrating the presence of a strong inflammatory process. Tests which reveal inflammation throughout the body include **erythrocyte sedimentation rate**, blood tests which may reveal anemia and increased white blood cells, and tests to demonstrate the presence of immune

complexes and/or antibodies circulating in the blood. An x-ray procedure, called **angiography**, involves injecting dye into a major artery, and then taking x-ray pictures to examine the blood vessels, in order to demonstrate the presence of inflammation of the vessel walls. Tissue samples (biopsies) may be taken from affected organs to demonstrate inflammation.

Treatment

Even though there are many different types of vasculitis, with many different symptoms based on the organ system affected, treatments are essentially the same. They all involve trying to decrease the activity of the immune system. Steroid medications (like prednisone) are usually the first types of drugs used. Steroids work by interfering with the chemicals involved in the inflammatory process. More potent drugs for severe cases of vasculitis have more serious side effects. These include drugs like cyclophosphamide. Cyclophosphamide works by actually killing cells of the patient's immune system.

Prognosis

The prognosis for vasculitis is quite variable. Some mild forms of vasculitis, such as those brought on by reactions to medications, may resolve totally on their own and not even require treatment. Temporal arteritis, serum sickness, Henoch-Schonlein purpura, and Kawasaki's disease usually have excellent prognoses, although when Kawasaki's affects the heart, there is a high **death** rate. Other types of vasculitis were always fatal, prior to the availability of prednisone and cyclophosphamide, and continue to have high rates of fatal complications. These include polyarteritis nodosa and Wegener's granulomatosis.

Prevention

Because so little is known about what causes a particular individual to develop vasculitis, there are no known ways to prevent it.

Resources

BOOKS

Harrison's Principles of Internal Medicine. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

"Vasculitides." In *Cecil Essentials of Medicine*, ed. Thomas E. Andreoli, et al. Philadelphia: W. B. Saunders Co., 1997.

PERIODICALS

Bush, Thomas M. "Systemic Vasculitis: Diagnostic Clues to this Confusing Array of Diseases." *Postgraduate Medicine* 103, no. 2 (Feb. 1998): 68+.

Jennette, J. Charles. "Small-Cell Vasculitis." *The New England Journal of Medicine* 337, no. 21 (20 Nov. 1997): 1512+.

- Ledford, Dennis K. "Immunologic aspects of Vasculitis and Cardiovascular Disease." *The Journal of the American Medical Association* 278, no. 22 (10 Dec. 1997): 1962+.
- Watts, R. A., and D. G. I. Scott. "Rashes and Vasculitis." *British Medical Journal* 310, no. 6987 (29 Apr. 1995): 1128+.

ORGANIZATIONS

- Lupus Foundation of America. 1300 Piccard Dr., Suite 200, Rockville, MD 20850. (800) 558-0121. <<http://www.lupus.org>>.
- Wegener's Foundation, Inc. 3705 South George Mason Drive, Suite 1813 South, Falls Church, VA 22041. (703) 931-5852.

Rosalyn Carson-DeWitt, MD

Vasectomy

Definition

A vasectomy is a surgical procedure performed on males in which the vas deferens (tubes that carry sperm from the testicles to the seminal vesicles) are cut, tied, cauterized (burned or seared) or otherwise interrupted. The semen no longer contains sperm after the tubes are cut, so conception cannot occur. The testicles continue to produce sperm, but they die and are absorbed by the body.

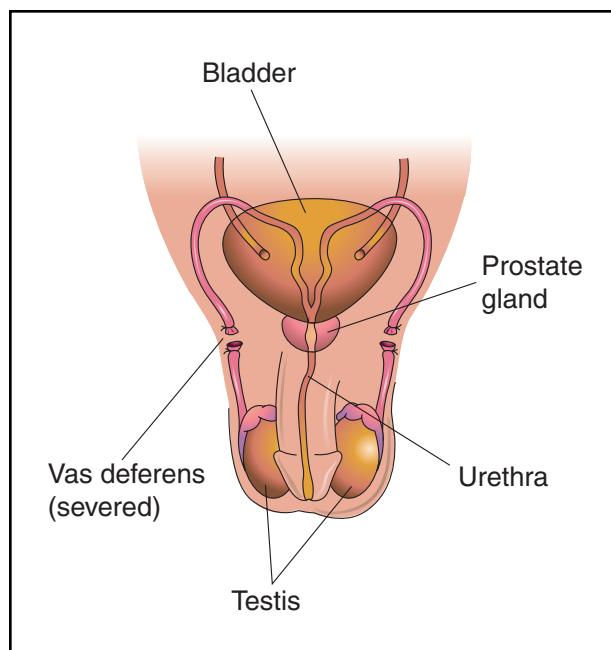
Purpose

The purpose of this operation is to provide reliable **contraception**. Research indicates that the level of effectiveness is 99.6%. Vasectomy is the most reliable method of contraception.

Description

Vasectomies are often performed in the doctor's office using a local anesthesia. The patient's scrotum area will be shaved and cleaned with an antiseptic solution to reduce the chance of infection. A small incision is made into the scrotum (the sac containing the testicles that produce the sperm). Each of the vas deferens (one from each testicle) is tied in two places with nonabsorbable (permanent) sutures and the tube is severed between the ties. The ends may be cauterized (burned or seared) to decrease the chance that they will leak or grow back together.

Sterility does not occur immediately after the procedure is finished. Men must use other methods of contraception until two consecutive semen analyses confirm that there are no sperm present in the semen. This will take four to six weeks or 15-20 ejaculations to clear all of the sperm from the tubes.



Vasectomy is a surgical procedure performed on males in which the vas deferens (tubes that conduct sperm from the testicles to the penis) are cut, tied, cauterized, or otherwise interrupted. Although the testicles still produce sperm, the sperm die and are absorbed by the body. Men who have had vasectomies may continue to ejaculate the same amount of semen as before the procedure. (Illustration by Electronic Illustrators Group.)

"No scalpel" vasectomies are gaining popularity. Instead of an incision, a small puncture is made into the scrotum. The vas deferens are cut and sealed in a manner similar to that described above. No stitches are necessary and the patient has less **pain**. Other advantages include less damage to the tissues, less bleeding, less risk of infection, and less discomfort after the procedure.

In some, cases vasectomies may be reversed. However, this procedure should be considered permanent as there is no guarantee of successful reversals.

Preparation

No special physical preparation is required. The physician will first assess the patient's general health in order to identify any potential problems that could occur. The doctor will then explain possible risks and side effects. The patient is asked to sign a consent form which indicates that he understands the information he has received, and gives the doctor permission to perform the operation.

Aftercare

Following the surgery, ice packs are often applied to scrotum to decrease pain and swelling. A dressing

KEY TERMS

Ejaculation—The act of expelling the sperm through the penis during orgasm.

Epididymitis—Inflammation of the small tube that rests on top of the testicle and is part of the system that carries sperm from the testicle to the penis. The condition can be successfully treated with antibiotics if necessary.

Scrotum—The sac which contains the testicles.

Sperm granuloma—A collection of fluid that leaks from an improperly sealed or tied vas deferens. They usually disappear on their own, but can be drained if necessary.

Testicles—The two egg-shaped organs found in the scrotum that produce sperm.

Tubal ligation—A surgical procedure in which the fallopian tubes are tied in two places and cut between. This prevents eggs from moving from the ovary to the uterus.

(or athletic supporter) which supports the scrotum can also reduce pain. Mild over-the-counter pain medication such as **aspirin** or **acetaminophen** (Tylenol) should be able to control any discomfort. Activities may be restricted for one to two days, and sexual intercourse for three to four days.

Risks

There are very few risks associated with vasectomy other than infection, bruising, **epididymitis** (inflammation of the tube that carries the sperm from the testicle to the penis), and sperm granulomas (collection of fluid that leaks from a poorly sealed or tied vas deferens). These are easily treated if they do occur. Patients do not experience difficulty achieving an erection, maintaining an erection, or ejaculating. There is no decrease in the production of the male hormone (testosterone), and sex drive and ability are not altered. Vasectomy is safer and less expensive than **tubal ligation** (sterilization of a female by cutting the fallopian tube to prevent conception).

Normal results

Normally, vasectomies are 99% successful in preventing conception. As such, it is one of the most effective methods available to consumers.

Resources

BOOKS

Nichols, Francine H., and Elaine Zwelling. *Maternal-Newborn Nursing: Theory and Practice*. Philadelphia.: W. B. Saunders Co., 1997.

Olds, Sally B., Marcia L. London, and Patricia Wieland Ladewig. *Maternal-Newborn Nursing: A Family Centered Approach*. Menlo Park, CA.: Addison-Wesley, 1996.

ORGANIZATIONS

Planned Parenthood League of Massachusetts. (800) 258-4448.
<http://www.pplm.org>.

Donald G. Barstow, RN

Vasodilators

Definition

Vasodilators are medicines that act directly on muscles in blood vessel walls to make blood vessels widen (dilate).

Purpose

Vasodilators are used to treat high blood pressure (**hypertension**). By widening the arteries, these drugs allow blood to flow through more easily, reducing blood pressure. Controlling high blood pressure is important because the condition puts a burden on the heart and the arteries, which can lead to permanent damage over time. If untreated, high blood pressure increases the risk of heart attacks, **heart failure**, **stroke**, or kidney failure. Vasodilators usually are prescribed with other types of blood pressure drugs and rarely are used alone.

Description

Examples of vasodilators are hydralazine (Apresoline) and **minoxidil** (Loniten). The vasodilator hydralazine also may be used to control high blood pressure in pregnant women or to bring down extremely high blood pressure in emergency situations. In the forms used for treating high blood pressure (tablets or injections), these drugs are available only with a physician's prescription. A liquid form of minoxidil, used to promote hair growth in people with certain kinds of baldness and is applied directly to the scalp, is sold without a prescription.

Recommended dosage

The recommended dosage depends on the type of vasodilator. Check with the physician who prescribed the

drug or the pharmacist who filled the prescription for the correct dosage, and use the medicine only as directed.

Physicians usually prescribe vasodilators along with other blood pressure medicines. Taking each drug at the correct time is extremely important. Health care providers can offer suggestions of ways to remember when to take each drug.

Precautions

Seeing a physician regularly while taking a vasodilator is important, especially during the first few months. The physician will check to make sure the medicine is working as it should and will watch for unwanted side effects. People who have high blood pressure often feel fine. But even when they feel well, patients should keep seeing their physicians and taking their medicine.

Vasodilators will not cure high blood pressure, but will help control the condition. To avoid the serious health problems that high blood pressure can cause, patients may have to take medicine for the rest of their lives. Furthermore, medicine alone may not be enough. People with high blood pressure may also need to avoid certain foods and keep their weight under control. The health care professional who is treating the condition can offer advice on what measures may be necessary.

Some people feel dizzy or have headaches while using this medicine. These problems are especially likely to occur in older people, who are more sensitive than younger people to the medicine's effects. Anyone who takes these drugs should not drive, use machines, or do anything else that might be dangerous until they know how the drugs affect them.

Special conditions

People who have certain medical conditions or who are taking certain other medicines may have problems if they take vasodilators. Before taking these drugs, be sure to let the physician know about any of these conditions:

ALLERGIES. Anyone who has had an unusual reaction to a vasodilator in the past should let his or her physician know before taking this type of drug again. The physician should also be told about any **allergies** to foods, dyes, preservatives, or other substances.

PREGNANCY. Several problems—from excess hair growth to blood abnormalities—have been reported in babies whose mothers take this vasodilator during **pregnancy**. In studies of laboratory animals, hydralazine causes **birth defects** in mice and rabbits, but not in rats. The effects of taking vasodilators during pregnancy have not been specifically studied in humans. Women who are

pregnant or who may become pregnant should check with their physicians before using this medicine. Women who become pregnant while taking a vasodilator should tell their physicians right away.

BREASTFEEDING. Women who are breastfeeding their babies or who plan to breastfeed should check with their physicians before using this medicine.

OTHER MEDICAL CONDITIONS. Using a vasodilator to lower blood pressure may worsen the problems that result from heart disease, blood vessel disease, or a recent **heart attack** or stroke. This medicine may also make **angina** (chest pain) worse. And in people with **pheochromocytoma** (tumor of the adrenal medulla), vasodilators may make the tumor more active. Before using a vasodilator, people with any of these medical problems should make sure their physicians are aware of their conditions.

People with kidney disease should also check with their physicians before using a vasodilator. Side effects may be greater in these people because their kidneys are slow to clear the medicine from the body.

USE OF CERTAIN MEDICINES. Taking vasodilators with certain other drugs may affect the way the drugs work or may increase the chance of side effects. Do not take any other prescription or nonprescription (over-the-counter) medicine with a vasodilator unless it has been discussed with the physician who prescribed the vasodilator.

Side effects

Some side effects of vasodilators go away as the body adjusts to the drug and do not need medical attention unless they continue or they interfere with normal activities. These include:

- headache
- nausea or vomiting
- diarrhea
- loss of appetite

In addition, minoxidil may cause a temporary increase in hair growth, especially on the face, arms, and back. Patients who are bothered by this should check with their physicians.

Other side effects of vasodilators should have medical attention. Check with a physician immediately if a fast or irregular heartbeat occurs. And if any of the following problems occur, check with a physician as soon as possible:

- chest pain
- muscle pain

KEY TERMS

Adrenal gland—One of a pair of organs located next to the kidneys. The adrenal glands produce hormones that control many body functions.

Adrenal medulla—The inner part of the adrenal gland. The adrenal medulla produces the hormones epinephrine (adrenaline), which stimulates the heart, tightens blood vessels, and relaxes some smooth muscles; and norepinephrine, which has similar effects.

Arteries—Blood vessels that carry blood away from the heart to the cells, tissues, and organs of the body.

- joint pain
- pain, numbness, tingling or weakness in the hands or feet
- swollen feet or lower legs
- swollen lymph nodes
- bloating
- **fever and sore throat**
- general discomfort or feeling of illness
- weakness
- blisters on skin; skin rash or **itching**; flushing or redness of the skin

Additional side effects are possible. Anyone who has unusual symptoms while taking a vasodilator should get in touch with his or her physician.

Interactions

Vasodilators may interact with other medicines. When this happens, the effects of one or both of the drugs may change or the chance of side effects may be greater. In addition, many prescription and nonprescription (over-the-counter) drugs may affect blood pressure. *Do not take any other medicine without the approval of the physician who prescribed the vasodilator.* In particular, avoid using over-the-counter medicines for appetite control, colds, **cough**, sinus problems, **asthma**, hay fever and other allergies, as these may increase blood pressure. At the other extreme, dangerously low blood pressure may result when drugs such as the blood pressure medicine guanethidine (Ismelin) or nitrates, used to treat chest pain, are combined with vasodilators.

Nancy Ross-Flanigan

Vasodilatory see **Shock**

Vasopressin test see **Antidiuretic hormone (ADH) test**

Vasovagal faint see **Fainting**

Vegetarianism

Definition

Vegetarianism is the voluntary abstinence from eating meat. Vegetarians refrain from eating meat for various reasons, including religious, health, and ethical ones. Lacto-ovo vegetarians supplement their diet with dairy (lactose) products and eggs (ovo). Vegans (pronounced vee-guns) do not eat any animal-derived products at all.

Purpose

Vegetarianism is recommended as a dietary therapy for a variety of conditions, including heart disease, **high cholesterol**, diabetes, and **stroke**. Vegetarianism is a major dietary therapy in the alternative treatment of **cancer**. Other conditions treated with a dietary therapy of vegetarianism include **obesity**, **osteoporosis**, **arthritis**, **allergies**, **asthma**, environmental illness, **hypertension**, **gout**, **gallstones**, **hemorrhoids**, **kidney stones**, ulcers, colitis, **premenstrual syndrome**, **anxiety**, and depression. Vegetarians often report higher energy levels, better digestion, and mental clarity. Vegetarianism is an economical and easily implemented preventative practice as well.

Description

The term vegetarian was coined in 1847 by the founders of the Vegetarian Society of Great Britain, but vegetarianism has been around as long as people have created **diets**. Some of the world's oldest cultures advocate a vegetarian diet for health and religious purposes. In India, millions of Hindus are vegetarians because of their religious beliefs. One of the ancient mythological works of Hinduism, the *Mahabharata*, states that, "Those who desire to possess good memory, beauty, long life with perfect health, and physical, moral and spiritual strength, should abstain from animal foods." The **yoga** system of living and health is vegetarian, because its dietary practices are based on the belief that healthy food contains *prana*. Prana is the universal life energy, which yoga experts believe is abundant in fresh fruits, grains, nuts and vegetables, but absent in meat because meat has been killed. Yogis also believe that spiritual health is influenced by the

DR. JOHN HARVEY KELLOGG (1852–1943)



(AP/Wide World Photos. Reproduced by permission.)

John Harvey Kellogg is known as the father of modern breakfast cereal. He was born in Tyrone Township, Michigan, on February 26, 1852, into a Seventh Day Adventist family. At age 12, he became an apprentice at the Review and Herald Press, a publishing company run by the church. He attended school in Battle Creek, Michigan. He attended Bellevue Hospital Medical College in

New York where he received his medical degree in 1875. In 1876, at the age of 24, Kellogg became an abdominal surgeon and superintendent of the Western Health Reform Institute, which he renamed the Battle Creek Sanitarium. There, he began applying his theories about natural living to his medical practice. Himself a vegetarian, he first advocated a diet high in whole grains, fruits, nuts, and legumes. He later included all types of vegetables in the diet. His controversial health regimen included morning calisthenics, open-air sleeping, cleansing enemas, chewing food hundreds of times before swallowing, and drinking plenty of water.

In the 1890s, Kellogg established a laboratory at the sanitarium to develop more nutritious foods. His brother, Will Keith Kellogg, joined in his research. In 1895 they developed a breakfast cereal of wheat flakes called Granose. The cereal quickly grew in popularity and was soon sold by mail order. This was followed by rice flakes and corn flakes. The brothers established the Sanitas Food Company. But philosophical differences led them to split into two companies. Will founded the W. K. Kellogg Company, which retained the rights to the cereal products. John set up the Battle Creek Food Company, which produced coffee substitutes and soymilk. John Kellogg also edited *Good Health Magazine*, which promoted vegetarianism, for 60 years. In 1904, he published a book, *The Miricle of Life*. He continued to promote his version of healthy living and radical techniques until his death in 1943.

practice of *ahimsa*, or not harming living beings. The principle of *ahimsa* (non-violence) appears in the Upanishads (Vedic literature) from c. 600–300 b.c. Taking of animal life or human life under any circumstances is sinful and results in rebirth as a lower organism. It became a fundamental element of Jainism, another religion of India. Some Buddhists in Japan and China are also vegetarian because of spiritual beliefs. In the Christian tradition, the Trappist Monks of the Catholic Church are vegetarian, and some vegetarians argue that there is evidence that Jesus and his early followers were vegetarian. Other traditional cultures, such as those in the Middle East and the Mediterranean regions, have evolved diets that frequently consist of vegetarian foods. The Mediterranean diet, which a Harvard study declared to be one of the world's healthiest, is primarily, although not strictly, vegetarian.

The list of famous vegetarians forms an illustrious group. The ancient Greek philosophers, including Socrates, Plato, and Pythagoras, advocated vegetarianism. In modern

times, the word to describe someone who likes to feast on food and wine is "epicure," but it is little known that Epicurus, the ancient philosopher, was himself a diligent vegetarian. Other famous vegetarians include Leonardo da Vinci, Sir Isaac Newton, Leo Tolstoy, Ralph Waldo Emerson, and Henry Thoreau. This century's celebrated vegetarians include Gandhi, the physician Albert Schweitzer, writer George Bernard Shaw, musician Paul McCartney, and champion triathlete Dave Scott. Albert Einstein, although not a strict vegetarian himself, stated that a vegetarian diet would be an evolutionary step for the human race.

Vegetarianism in America received a lot of interest during the last half of the nineteenth century and the beginning of the twentieth century, during periods of experimentation with diets and health practices. Vegetarianism has also been a religious practice for some Americans, including the Seventh-day Adventists, whose lacto-ovo vegetarian diets have been studied for their health benefits. Vegetarianism has been steadily gaining acceptance as an alterna-

tive to the meat-and-potatoes bias of the traditional American diet. In 1997, Vegetarian Resource Group performed a Roper poll that showed that 13 million Americans, or 5% of the population, identified themselves as vegetarians.

Several factors contribute to the interest in vegetarianism in America. Outbreaks of **food poisoning** from meat products, as well as increased concern over the additives in meat such as hormones and **antibiotics**, have led some people and professionals to question meat's safety. There is also an increased awareness of the questionable treatment of farm animals in factory farming. But the growing health consciousness of Americans is probably the major reason for the surge in interest in vegetarianism. **Nutrition** experts have built up convincing evidence that there are major problems with the conventional American diet, which is centered around meat products that are high in cholesterol and saturated fat and low in fiber. Heart disease, cancer, and diabetes, which cause 68% of all deaths in America, are all believed to be influenced by this diet. Nutritionists have repeatedly shown in studies that a healthy diet consists of plenty of fresh vegetables and fruits, complex carbohydrates such as whole grains, and foods that are high in fiber and low in cholesterol and saturated fat. Vegetarianism, a diet that fulfills all these criteria, has become part of many healthy lifestyles. In alternative medicine, vegetarianism is a cornerstone dietary therapy, used in **Ayurvedic medicine, detoxification** treatments, macrobiotics, the Ornish diet for heart disease, and in therapies for many chronic conditions.

Preparations

Some people, particularly those with severe or chronic conditions such as heart disease or cancer, may be advised by a health practitioner to become vegetarian suddenly. For most people, nutritionists recommend that a vegetarian diet be adopted gradually, to allow people's bodies and lifestyles time to adjust to new eating habits and food intake.

Some nutritionists have designed transition diets to help people become vegetarian in stages. Many Americans eat meat products at nearly every meal, and the first stage of a transition diet is to substitute just a few meals a week with wholly vegetarian foods. Then, particular meat products can be slowly reduced and eliminated from the diet and replaced with vegetarian foods. Red meat can be reduced and then eliminated, followed by pork, poultry, and fish. For those wishing to become pure vegetarians or vegans, the final step would be to substitute eggs and dairy products with other nutrient-rich foods. Individuals should be willing to experiment with transition diets, and should have patience when learning how combine vegetarianism with social activities such as dining out.

The transition to vegetarianism can be smoother for those who make informed choices with dietary practices. Sound nutritional guidelines include decreasing the intake of fat, increasing fiber, and emphasizing fresh fruits, vegetables, legumes, and whole grains in the diet while avoiding processed foods and sugar. Everyone can improve their health by becoming familiar with recommended dietary and nutritional practices, such as reading labels and understanding basic nutritional concepts such as daily requirements for calories, protein, fat, and nutrients. Would-be vegetarians can experiment with meat substitutes, foods that are high in protein and essential nutrients. Thanks to the growing interest in vegetarianism, many meat substitutes are now readily available. Tofu and tempeh are products made from soybeans that are high in protein, calcium, and other nutrients. There are "veggie-burgers" that can be grilled like hamburgers, and vegetarian substitutes for turkey and sausage with surprisingly authentic textures and taste. There are many vegetarian cookbooks on the market as well.

Precautions

In general, a well-planned vegetarian diet is healthy and safe. However, vegetarians, and particularly vegans who eat no animal products, need to be aware of particular nutrients that may be lacking in non-animal diets. These are amino acids, vitamin B₁₂, vitamin D, calcium, iron, zinc, and essential fatty acids. Furthermore, pregnant women, growing children, and those with health conditions have higher requirements for these nutrients.

Vegetarians should be aware of getting *complete protein* in their diets. A complete protein contains all of the essential amino acids, which are the building blocks for protein essential to the diet because the body cannot make them. Meat and dairy products generally contain complete proteins, but most vegetarian foods such as grains and legumes contain incomplete proteins, lacking one or more of the essential amino acids. However, vegetarians can easily overcome this by combining particular foods in order to create complete proteins. For instance, beans are high in the amino acid lysine but low in tryptophan and methionine, but rice is low in lysine and high in tryptophan and methionine. Thus, combining rice and beans makes a complete protein. In general, combining legumes such as soy, lentils, beans, and peas with grains like rice, wheat, or oats forms complete proteins. Eating dairy products or nuts with grains also makes proteins complete. Oatmeal with milk on it is complete, as is peanut butter on whole wheat bread. Proteins do not necessarily need to be combined in the same meal, but generally within four hours.

Getting enough vitamin B₁₂ may be an issue for some vegetarians, particularly vegans, because meat and dairy products are the main sources. Vitamin supplements that contain vitamin B₁₂ are recommended. Spirulina, a nutritional supplement made from algae, is also a vegetarian source, as are fortified soy products and nutritional yeast.

Vitamin D can be obtained by **vitamins**, fortified foods, and sunshine. Calcium can be obtained in enriched tofu, seeds, nuts, legumes, dairy products, and dark green vegetables including broccoli, kale, spinach, and collard greens. Iron is found in raisins, figs, legumes, tofu, whole grains (particularly whole wheat), potatoes, and dark green leafy vegetables. Iron is absorbed more efficiently by the body when iron-containing foods are eaten with foods that contain vitamin C, such as fruits, tomatoes, and green vegetables. Zinc is abundant in nuts, pumpkin seeds, legumes, whole grains, and tofu. For vegetarians who don't eat fish, getting enough omega-3 essential fatty acids may be an issue, and supplements such as flaxseed oil should be considered, as well as eating walnuts and canola oil.

Vegetarians do not necessarily have healthier diets. Some studies have shown that some vegetarians consume large amounts of cholesterol and saturated fat. Eggs and dairy products contain cholesterol and saturated fat, while nuts, oils, and avocados are vegetable sources of saturated fat. To reap the full benefits of a vegetarian diet, vegetarians should be conscious of cholesterol and saturated fat intake. Vegetarians may also consider buying organic foods, which are grown without the use of synthetic chemicals, as another health precaution.

Research and general acceptance

A vegetarian diet has many well-documented health benefits. It has been shown that vegetarians have a higher life expectancy, as much as several years, than those who eat a meat-centered diet. The U.S. Food and Drug Administration (FDA) has stated that data has shown vegetarians to have a strong or significant probability against contracting obesity, heart disease, lung cancer, **colon cancer**, **alcoholism**, hypertension, diabetes, gallstones, gout, kidney stones, and ulcers. However, the FDA also points out that vegetarians tend to have healthy lifestyle habits, so other factors may contribute to their increased health besides diet alone.

A vegetarian diet, as prescribed by Dr. Dean Ornish, has been shown to improve heart disease and reverse the effects of **atherosclerosis**, or hardening of the arteries. It should be noted that Dr. Ornish's diet was used in conjunction with **exercise**, **stress reduction**, and other holistic methods. The Ornish diet is lacto-ovo vegetarian, because it allows the use of egg whites and non-fat dairy products.

Vegetarians have a resource of statistics in their favor when it comes to presenting persuasive arguments in favor of their eating habits. Vegetarians claim that a vegetarian diet is a major step in improving the health of citizens and the environment. Americans eat over 200 lbs (91 kg) of meat per person per year. The incidence of heart disease, cancer diabetes, and other diseases has increased along with a dramatic increase in meat consumption during the past century. Many statistics show significantly smaller risks for vegetarians contracting certain conditions. The risks of women getting **breast cancer** and men contracting prostate cancer are nearly four times as high for frequent meat eaters as for those who eat meat sparingly or not at all. For heart attacks, American men have a 50% risk of having one, but the risk drops down to 15% for lacto-ovo vegetarians and to only 4% for vegans. For cancer, studies of populations around the world have implied that plant-based diets have lower associated risks for certain types of cancer.

Vegetarians claim other reasons for adopting a meat-free diet. One major concern is the amount of pesticides and synthetic additives such as hormones that show up in meat products. Chemicals tend to accumulate in the tissue of animals that are higher in the food chain, a process called *bioaccumulation*. Vegetarians, by not eating meat, can avoid the exposure to these accumulated toxins, many of which are known to influence the development of cancer. One study showed that DDT, a cancer-causing pesticide, was present in significant levels in mother's milk for 99% of American women, but only 8% of vegetarian women had significant levels of the pesticide. Women who eat meat had 35 times higher levels of particular pesticides than vegetarian women. The synthetic hormones and antibiotics added to American cattle has led some European countries to ban American beef altogether. The widespread use of antibiotics in livestock has made many infectious agents more resistant to them, making some diseases harder to treat.

Vegetarians resort to ethical and environmental arguments as well when supporting their food choices. Much of U.S. agriculture is dedicated to producing meat, which is an expensive and resource-depleting practice. It has been estimated that 1.3 billion people could be fed with the grain that America uses to feed livestock, and **starvation** is a major problem in world health. Producing meat places a heavy burden on natural resources, as compared to growing grain and vegetables. One acre of land can grow approximately 40,000 lbs (18,000 kg) of potatoes or 250 lbs (113 kg) of beef, and it takes 50,000 gal (200,000 l) of water to produce 1 lb (0.45 kg) of California beef but only 25 gal (100 l) of water to produce 1 lb (0.45 kg) of wheat. Half of all water used in America is for livestock production. Vegetarians argue that the

KEY TERMS

Cholesterol—A steroid fat found in animal foods that is also produced in the body from saturated fat for several important functions. Excess cholesterol intake is linked to many diseases.

Complex carbohydrates—Complex carbohydrates are broken down by the body into simple sugars for energy, are found in grains, fruits and vegetables. They are generally recommended in the diet over refined sugar and honey, because they are a more steady source of energy and often contain fiber and nutrients as well.

Legume—Group of plant foods including beans, peas, and lentils, which are high in protein, fiber, and other nutrients.

Organic food—Food grown without the use of synthetic pesticides and fertilizers.

Saturated fat—Fat that is usually solid at room temperature, found mainly in meat and dairy products but also in vegetable sources such as some nuts, seeds, and avocados.

Unsaturated fat—Fat found in plant foods that is typically liquid (oil) at room temperature. They can be monounsaturated or polyunsaturated, depending on the chemical structure. Unsaturated fats are the most recommended dietary fats.

American consumption of beef may also be contributing to global warming, by the large amounts of fossil fuels used in its production. The South American rainforest is being cleared to support America's beef consumption, as the United States yearly imports 300 million lbs (136 million kg) of meat from Central and South America. The production of meat has been estimated as causing up to 85% of the loss of topsoil of America's farmlands.

Despite the favorable statistics, vegetarianism does have its opponents. The meat industry in America is a powerful organization that has spent millions of dollars over decades advertising the benefits of eating meat. Vegetarians point out that life-long eating habits are difficult to change for many people, despite research showing that vegetarian diets can provide the same nutrients as meat-centered diets.

Resources

BOOKS

Akers, Keith. *A Vegetarian Sourcebook*. New York: Putnam, 1993.

Null, Gary. *The Vegetarian Handbook*. New York: St. Martins, 1987.

Robbins, John. *Diet for a New America*. Walpole, New Hampshire: Stillpoint, 1987.

PERIODICALS

Vegetarian Journal. Vegetarian Resource Group (VRG). PO Box 1463, Baltimore, MD 21203.

Vegetarian Times. 4 High Ridge Park, Stamford, CT 06905. (877) 321-1796.

Vegetarian Nutrition and Health Letter. 1707 Nichol Hall, Loma Linda, CA 92350. (888) 558-8703.

ORGANIZATIONS

North American Vegetarian Society (NAVS). PO Box 72, Dolgeville, NY 13329. (518) 568-7970.

Douglas Dupler

Vegetative state

Definition

A coma-like state characterized by open eyes and the appearance of wakefulness is defined as vegetative.

Description

The vegetative state is a chronic or long-term condition. This condition differs from a persistent vegetative state (PVS, a state of **coma** that lacks both awareness and wakefulness) since patients have awakened from coma, but still have not regained awareness. In the vegetative state patients can open their eyelids occasionally and demonstrate sleep-wake cycles. They also completely lack cognitive function. The vegetative state is also called coma vigil.

Causes and symptoms

The vegetative state can be caused by:

- cardiac arrest
- prolonged and profound **hypoglycemia** (an abnormal and severe decrease in blood sugar)
- carbon monoxide poisoning
- head injury
- brain hemorrhage
- compression of the brainstem
- tumors
- bilateral hemispheric demyelination (a loss of nerve cells)

- injury of the brain following infections (**meningitis** or **encephalitis**)
- neurodegenerative diseases
- anencephaly (an abnormality of the brain and skull)
- diffuse nerve cell injury

Patients in a vegetative state apparently have functioning of a special area in the brain called the reticular activating system (RAS) responsible for sleep-wake cycles. The connections that integrate more complex abilities such as awareness are interrupted. Patients in the vegetative state can open and close eyes spontaneously. They may appear to track or follow objects with their eyes. Patients may chew and swallow food placed in the mouth. The vegetative patient does not respond to sound, hunger, or **pain**. Patients cannot obey verbal commands and lack local motor responses. Additionally these patients cannot talk in comprehensible terms and they may become noisy, restless, and hypermobility. These patients are in a state of arousal but completely lack awareness.

Diagnosis

Diagnosis of vegetative state depends on the primary cause of brain dysfunction. A comprehensive history and neurological examination, neuroimaging studies, and chemical analysis of the blood are essential. Additionally, special tests such as cerebrospinal fluid (CSF, is the fluid that bathes and nourishes the brain and spinal cord) analysis and electroencephalographic (EEG analyzes the electrical activity within the brain) may be indicated to establish a diagnosis.

Treatment

Treatment is directed to presenting symptoms and patient needs. Patients require constant monitoring and assistance with feeding, hydration, hygiene, assisted movement (to help prevent ulcers and blood clots in the legs), and elimination of waste products.

Alternative treatment

There is no known alternative treatment for vegetative patients.

Prognosis

The prognosis is generally poor and the condition can persist chronically.

Prevention

There is no known prevention since this state can occur as a result of unavoidable situations such as an accident, tumor, and bleeding or genetic abnormality.

KEY TERMS

Cognitive—The ability (or lack of) to think, learn, and memorize.

Hypermobility—Increased movement of joints.

Resources

BOOKS

- Goetz, Christopher G., et al, eds. *Textbook of Clinical Neurology*. 1st ed. W. B. Saunders Company, 1999.
 Goldman, Lee, et al. *Cecil Textbook of Medicine*. 21st ed. W. B. Saunders Company, 2000.
 Miller, Ronald D., et al, eds. *Anesthesia*. 5th ed. Churchill Livingstone, Inc., 2000.
 Rosen, Peter. *Emergency Medicine: Concepts and Clinical Practice*. 4th ed. Mosby-Tear Book, Inc., 1998.

Laith Farid Gulli, M.D.

Velopharyngeal insufficiency

Definition

Velopharyngeal insufficiency is the improper closing of the velopharyngeal sphincter (soft palate muscle) during speech characterized by an acute nasal quality of the voice.

Description

At the back of the mouth is a circle of structures that include the tonsils, the tongue, and the palate. During speech, this apparatus must close off the nose for proper articulation of the explosive consonants “p,” “b,” “g,” “t,” and “d.” If it does not close, there is a snort sound produced through the nose. Improper function of this structure also produces a nasal tone to the voice.

Causes and symptoms

There are three main causes for this defect:

- Cleft palate is a congenital condition, producing a defect in the palate that allows air to escape upward during speech.
- If tonsil and adenoid surgery is done improperly, velopharyngeal insufficiency may result. The occurrence rate is approximately one in every 2,000-3,000 tonsillectomies.

KEY TERMS

Adenoids—Lymph glands just above the tonsils and the palate.

Cleft palate—Congenital defect marked by a split in the roof of the mouth.

Nasopharyngoscopy—A diagnostic procedure that examines the nasal passageways and pharynx with an instrument outfitted with an optical system.

Pharynx—A canal located between the mouth cavity and the esophagus.

Tonsillectomy—Surgical removal of the tonsils.

Tonsils—Lymph glands in the throat, just behind the back teeth.

- Nerve or muscle disease may paralyze the muscles that operate the velopharyngeal sphincter.

The primary symptom is the speech impediment. Some people develop a change in their speaking pattern or a series of facial grimaces to try to overcome the difficulty. If the condition is acute, regurgitation through the nose may occur.

Diagnosis

Examination of the velopharyngeal sphincter through ultrasound scans, fiber-optic nasopharyngoscopy, and videofluoroscopy will reveal the extent of velopharyngeal insufficiency. Speech and velopharyngeal sphincter movement are compared to make the diagnosis.

Treatment

Velopharyngeal insufficiency is treated with a combination of surgery and speech therapy. There are several surgical procedures that can be performed to correct the physical malfunction. They include:

- Pharyngeal flap procedure that moves the skin flap from the pharynx to the soft palate.
- Palatal push-back that separates the hard and soft palate in order to lengthen the soft palate.
- Pharyngoplasty that lengthens the soft palate by turning the pharyngeal skin flaps.
- Augmentation pharyngoplasty that inserts an implant into the pharyngeal wall to enlarge it, thus narrowing the velopharyngeal opening.
- Velopharyngeal sphincter reconstruction.

Prognosis

The combination of surgery to correct the insufficiency and speech therapy to retrain the voice successfully alleviate velopharyngeal insufficiency.

Resources

BOOKS

English, Gerald M. *Otolaryngology*. Philadelphia: J. B. Lippincott Co., 1990.

PERIODICALS

Conley, S. F., et al. "Identification and Assessment of Velopharyngeal Inadequacy." *American Journal of Otolaryngology* 18 (Jan./Feb. 1997): 38-46.

Eufinger, H., et al. "Speech Results and Velopharyngeal Morphology Following 151 Cranially Based Velopharyngoplasties." *Folia Phoniatrica et Logopedica* 47 (1995): 193-198.

Huang M. H., S. T. Lee, and K. Rajendran. "Anatomic Basis of Cleft Palate and Velopharyngeal Surgery: Implications from a Fresh Cadaveric Study." *Plastic & Reconstructive Surgery* 101 (Mar. 1998): 613-627.

Morris, H. L., et al. "Clinical Results of Pharyngeal Flap Surgery: the Iowa Experience." *Plastic & Reconstructive Surgery* 95 (Apr. 1995): 652-662.

Ren, Y. F., A. Isberg, and G. Henningsson. "Velopharyngeal Incompetence and Persistent Hypernasality after Adenoidectomy in Children without Palatal Defect." *Cleft Palate-Craniofacial Journal* 32 (Nov. 1995): 476-482.

Sell, D., and L. Ma. "A Model of Practice for the Management of Velopharyngeal Dysfunction." *British Journal of Oral & Maxillofacial Surgery* 34 (Oct. 1996): 357-363.

J. Ricker Polsdorfer, MD

Vena cava filter

Definition

A vena cava filter is a device inserted into a major vein to prevent a blood clot from entering the lungs.

Purpose

The purpose of a vena cava filter is to prevent a blood clot from potentially traveling to the lungs. A thrombus clot traveling to the lungs is called a **pulmonary embolism** (PE). A thrombus in the deep venous system (the part of the circulation that brings blood back to the heart) represents a disorder of normal hemostasis (the normal clotting of blood).

Insertion of a vena cava filter is indicated for patients who:

- cannot receive medications that can dissolve the clot (anticoagulation therapy)
- have a thrombus in a deeply situated vein
- experience complication of anticoagulation therapy such as bleeding
- experience failure of anticoagulation therapy to prevent pulmonary **embolism**
- have an embolus in the lungs (pulmonary embolectomy) removed
- have a recurrent embolism while receiving adequate medications
- have significant bleeding complications during anticoagulation

Precautions

There are no significant precautions concerning insertion of a vena cava filter. The devices are usually effective and short-term complications are unusual.

Description

Vena cava filters are usually inserted in order to prevent PE caused by a thrombosis in a deep vein (DVT). Approximately 60% of patients who die in a hospital have evidence of PE during **autopsy**. The incidence (number of new cases) of DVT is highest for patients undergoing surgical repair of a fractured hip. However, DVT is common in both surgical and medical patients. DVT is found in 29–33% of patients in medical intensive care units (MICU) and in 27–40% of patients with a **heart attack** (myocardial infarction). Vena cava filters are placed to prevent thrombi from entering the lungs. There is currently a new type of filter called the Kim-Ray-Greenfield filter.

Preparation

Insertion of a vena cava filter is an invasive procedure. The patient is prepared for this procedure using standard surgical protocols. The VCF is commonly implanted in the jugular vein in the neck or the femoral vein in the groin. The procedure is generally well tolerated.

Aftercare

This depends on the patient's health status and recommendation's for continued care.

Risks

Many patients have died from PE even with a vena cava implantation. Use of a VCF is primarily indicated if

KEY TERMS

Embolus—An embolus (or emboli the plural form) is a blood clot that has detached from its site of origin and travels to the lungs (pulmonary artery), where it can rupture the artery, causing death.

Pulmonary embolism—A traveling thrombus that has lodged in the pulmonary artery.

Thrombus—A thrombus (or thrombi the plural form) is a blood clot that can form in a deeply situated vein.

there are contraindications for anticoagulation therapy. VCF can increase a patient's susceptibility for developing recurrent DVT.

Normal results

Patient progresses well and prevention of large emboli that can cause a PE is successful.

Abnormal results

The desired effect is not accomplished and the patient develops a PE resulting in **death**.

Resources

BOOKS

Bone, Roger C. *Pulmonary & Critical Care Medicine*. Mosby-Year Book, Inc., 2000.

Braunwald, Eugene, et al, eds. *Heart Disease: A Textbook of Cardiovascular Medicine*. 6th ed. W. B. Saunders Company, 2001.

Goldman, Lee, et al, eds. *Cecil Textbook of Medicine*. 21st ed. W. B. Saunders Company, 2000.

Rakel, Robert E., et al, eds. *Emergency Medicine: Concepts and Clinical Practice*. 4th ed. Mosby-Year Book, Inc., 1998.

Rakel, Robert E., et al, eds. *Conn's Current Therapy*. 53rd ed. W. B. Saunders Company, 2001.

Townsend, Courtney M. *Sabiston Textbook of Surgery*. 16th ed. W. B. Saunders Company, 2001.

PERIODICALS

Isnard, R., and M. Komajda. "Thromboembolism in Heart Failure, Old Ideas and New Challenges." *European Journal of Heart Fail* (June 2001).

ORGANIZATIONS

American College of Angiology. 295 Northern Blvd., Ste. 104 Great Neck, NY 11021-4701.

Laith Farid Gulli, M.D.

Venereal diseases see **Sexually transmitted diseases**

Venography

Definition

Venography is an x-ray test that provides an image of the leg veins after a contrast dye is injected into a vein in the patient's foot.

Purpose

Venography is primarily performed to diagnose **deep vein thrombosis** (a condition that can lead to **pulmonary embolism**). It is the standard procedure used to detect this type of disorder. Venography can also be used to distinguish blood clots from obstructions in the veins, to evaluate congenital vein problems, to see how the deep leg vein valves are working, and to identify a vein for arterial bypass grafting.

Precautions

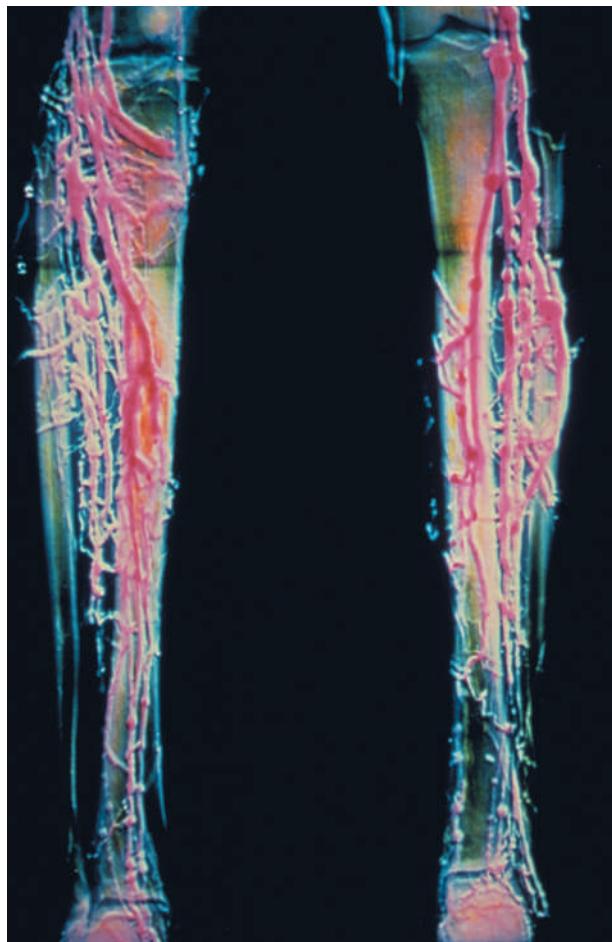
Venography is usually not performed in patients with kidney (renal) problems.

Description

Venography (also called phlebography, ascending contrast phlebography, or contrast venography) is an invasive diagnostic test that provides a constant image of leg veins on a fluoroscope screen. Venography identifies the location, extent, and degree of attachment of the blood clots, and enables the condition of the deep leg veins to be assessed. It is especially useful when there is a strong suspicion of deep vein thrombosis, but non-invasive tests have failed to identify the disease.

Venography is the most accurate test for detecting deep vein thrombosis. It is nearly 100% sensitive and specific in making this diagnosis (**pulmonary embolism** is diagnosed in other ways). Accuracy is crucial since deep vein thrombosis can lead to pulmonary embolism, a condition that can be fatal.

Venography is not used often, however, because it is painful, expensive, exposes the patient to a fairly high dose of radiation, and can cause complications. In about 5% of cases, there are technical problems in conducting the test. In addition, the test is less accurate in diagnosing problems below the knee. Venography takes between 30–45 minutes and can be done in a physician's office, a laboratory, or a hospital.



A venographic image of a patient's legs with varicose veins.
(Custom Medical Stock Photo. Reproduced by permission.)

During the procedure, the patient lies on a tilting x-ray table. The area where the catheter will be inserted will be shaved, if necessary, and cleaned. Sometimes a local anesthetic is injected to numb the skin at the site of the insertion. Sometimes a small incision is required to make a point for insertion. The catheter is inserted and the contrast solution (or dye) is slowly injected. Injection of the dye causes a warm, flushing feeling in the leg that may spread through the body. The contrast solution may also cause slight nausea. About 18% of patients experience discomfort from the contrast solution.

In order to fill the deep venous system with dye, a tight band (or tourniquet) may be tied around the ankle of the foot the dye is injected into, or the lower extremities may be tilted. The patient is asked to keep the leg still. The doctor also observes the movement of the solution through the vein with a fluoroscope. At the same time, a series of x rays are taken. When the test is finished, fluid is injected to clear the dye from the veins, the catheter is

removed, and a bandage is applied over the site of the injection.

Preparation

Fasting or drinking only clear liquids is necessary for four hours before the test. However, sometimes the test done in an emergency even if the patient has eaten. The contrast solution contains iodine, to which some people are allergic. Patients who have **allergies** or hay **fever**, or have had a bad reaction to a contrast solution, should tell their doctor. A sedative, such as diazepam (Valium), may be prescribed to help the patient relax.

Aftercare

Patients should drink large amounts of fluids to flush the remaining contrast solution from their bodies. The area around the incision will be sore for a few days. If there is swelling, redness, **pain**, or fever, the doctor should be notified. Pain medication may be needed. In most cases, the patient can resume normal activities the next day.

Risks

Venography can also cause complications such as phlebitis, tissue damage, and the formation of deep vein thrombosis in a healthy leg. A rare side effect in up to 8% of cases is a severe allergic reaction to the dye. This usually happens within 30 minutes after injection of the dye and requires medical attention.

Normal results

Normal venography results show proper blood flow through the leg veins.

Abnormal results

Abnormal venography results show well-defined filling defects in veins. Findings include:

- blood clots
- consistent filling defects
- an abrupt end of a test dye column
- major deep veins that are unfilled
- dye flow that is diverted

These results confirm a diagnosis of deep vein thrombosis

Resources

BOOKS

DeBakey, Michael E., and Antonio M. Gotto Jr. "Invasive Diagnostic Procedures." In *The New Living Heart*. Holbrook, MA: Adams Media Corporation, 1997.

KEY TERMS

Contrast solution—A liquid dye injected into the body that allows veins to be seen by x rays. Without the dye, the veins could not be seen on x rays.

Deep vein thrombosis—The development or presence of a blood clot in a vein deep within the leg. Deep vein thrombosis can lead to pulmonary embolism.

Invasive—A diagnostic test that invades healthy tissue; in the case of venography, through an incision in a healthy vein.

Pulmonary embolism—An obstruction of a blood vessel in the lungs, usually due to a blood clot, that blocks a pulmonary artery. Pulmonary embolism can be very serious and in some cases is fatal.

Texas Heart Institute. "Diseases of the Peripheral Arteries and Veins." In *Texas Heart Institute Heart Owner's Handbook*. New York: Wiley & Sons, 1996.

"Venography." In *Mayo Clinic Practice of Cardiology*. 3rd ed. St. Louis: Mosby, 1996.

"Venuous Imaging." In *Diagnostic Nuclear Medicine*. 3rd ed. Vol. 1. Baltimore: Williams & Wilkins, 1996.

PERIODICALS

Barloon T. J., G. R. Bergus, and J. E. Seabold. "Diagnostic Imaging of Lower Limb Deep Venous Thrombosis." *American Family Physician* 56 (1 Sept. 1997): 791-801.

Tapson, Victor F. "Pulmonary Embolism - New Diagnostic Approaches." *New England Journal of Medicine* 336 (15 May 1997).

OTHER

"Venography Helps Patients Avoid Hospital Readmission." *American Academy of Orthopaedic Surgeons Page*. 24 Feb. 1996. 4 Mar. 1998 <<http://www.aaos.org>>.

"Catching Deep Vein Thrombosis in Time: Diagnostic Tests at a Glance." *SpringNet*. 11 Aug. 1997. 4 Mar. 1998 <<http://www.springnet.com/ce/p507bs4.htm>>.

Lori De Milton

Venous access

Definition

Venous access introduces a needle into a vein, usually for the purpose of withdrawing blood or administering medication.

Purpose

Venous access is necessary for fluid administration, medication administration, and obtaining blood for chemical analysis. Sites for access include veins located in the peripheral arms or legs, scalp, neck, and bone.

Venous access in children may pose special problems since finding appropriate veins and **immobilization** may be difficult but essential. For complicated procedures **sedation** may be indicated. Venous access can be performed during emergency situations, for outpatients, inpatients, and those who require long term **chemotherapy**.

Precautions

There are no major precautions for access during emergency procedures. The main concern during an emergency would be to secure a portal of entry to infuse potentially life saving medications and fluids. For all methods of access the main precautionary measures include attention to accurate procedures. Proper procedures are necessary to minimize the possibility of infection, **embolism**, phlebitis, or destruction of neighboring tissue.

Description

For peripheral venipuncture the common site is usually a vein in the arm (the antecubital fossa located on the opposite side of the elbow) or on the flat bony area of the hand (dorsum of the hand). Scalp veins are accessible in infants under one year of age. The selected vein should be long and straight for needle accommodation. It should be identified by straightness, lack of pulsation (characteristic of an artery), and filling with blood from above (arteries fill from below). Internal jugular catheterization is performed in the neck using special bone and muscle landmarks. The external jugular vein can be cannulated by immobilizing tilted and rotating the head. The subclavian approach is a complicated procedure and emergency access can be performed if attempts for access a vein in other areas have failed. Intraosseous venous access is usually accomplished through a leg bone. Catheters implanted in the front of the chest (anterior chest wall) can accomplish long-term venous access. A large leg vein is preferably used and isolated by dissection. A catheter is inserted into the vein and they are tied together.

Preparation

For peripheral vein access in the arm, a tourniquet is applied a few inches over the puncture site. The skin over the puncture site is sterilized with an alcohol pad. The needle is inserted and either blood is drawn and the needle is removed, or a catheter is inserted to place an intra-

venous line. Scalp veins can be accessible by immobilizing the head, shaving the area from hair, and using a rubber band as a tourniquet. Internal jugular vein catheterization is accomplished by extending the patient's head over the edge of a table or cart and rotating away from the intended puncture site. Immobilizing the head and extending it 15–20 degrees over the edge of a bed or cart and rotating away from the puncture site can cannulate the external jugular vein. The subclavian vein access is a complicated procedure and requires sedation and special positioning (Trendelenburg). A towel should be placed in the back of the area. The skin should be cleansed and the puncture site is anesthetized. For the femoral approach the leg is externally rotated. The artery should be felt and along with specific anatomical landmarks the vein can be localized. The skin should be cleaned and anesthetized. During venous cutdown a large vein near the anklebone is carefully dissected away from underlying tissues. The area must be properly cleaned and anaesthetized prior to making an incision. A catheter is inserted and secured in place with sutures.

Aftercare

For simple procedures such as peripheral venous access, applying simple pressure (to stop bleeding) and a bandage may be sufficient. For more complicated procedures, the primary cause for access should be treated as well as care to avoid or treat potential complications that may arise from access.

Risks

For access into a peripheral vein, care must be taken not to puncture both sides of the vein. After removal of the needle or catheter, a piece of cotton and pressure should be applied over the puncture site to prevent unwanted bleeding. Access with a scalp vein should be performed with care to avoid hematoma formation (localized blood clot), accidental puncture of an artery, or infection. Access into the internal jugular vein in the neck can cause laceration of an artery or nerve. This procedure can also cause hematoma (blood clot) formation; damage to local nerves within the area, **pneumothorax**, or misplaced catheterization. Venous access into the external jugular vein can cause hematoma or placement outside the thorax. Subclavian vein access can cause air to enter a vein (resulting in an air embolus) or pneumothorax. Cannulation of the femoral vein in the groin area can cause infection or **thrombophlebitis**. Intraosseous venous access commonly performed in a leg bone can cause hematomas, infection or damage to bone marrow. This procedure should not be performed if the attempts in one leg is unsuccessful, the skin over the legs is diseased

KEY TERMS

Cannula—Insertion of a tube.

Catheterization—The process of inserting a tubular instrument into a body cavity to permit passage of fluid.

Phlebitis—Inflammation of a vein.

Pneumothorax—The presence of air in the cavity that surrounds the lungs.

new channels to re-direct blood flow). These re-canalized veins are inadequate and cannot correct the impairment of flow. However, larger veins may still remain occluded. When a thrombosis occurs the valves that regulate venous blood flow become thickened and incompetent, rendering them incapable of regulating back flow of blood. This valvular incompetence will cause an increase in the pressure within veins (venous **hypertension**). Venous hypertension is responsible for most of the symptoms associated with venous disease. Superficial veins can become dilated causing **varicose veins** (veins that bulge and seem tortuous). Leg ulcers can be severe and are responsible for 100,000 cases of disability in the United States alone.

(from a burn or infection), or there is a broken leg bone or bone disease. Venous cutdown can cause infection, loss of the catheter in the vein, phlebitis, or nerve damage.

Resources

BOOKS

Pfenninger, John L., et al, eds. *Procedures for Primary Care Physicians*. 1st ed. Mosby-Year Book, Inc., 1994.

ORGANIZATION

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Bilal Nasser, M.Sc.

Venous insufficiency

Definition

Venous insufficiency is described as abnormal blood flow through veins that can cause local damage, damage to affected legs, or **death**.

Description

Syndromes related to venous insufficiency are caused by valve incompetence. Venous insufficiency is a chronic (long term) condition. The number of new and existing cases is dependent on age and gender. Some patients may have a positive family history. Usually older persons and females are more commonly affected. Deep situated and superficial veins can be affected. **Cancer** obstructing veins in the pelvis area can cause superficial venous insufficiency. Deep venous insufficiency is commonly caused by **thrombophlebitis**, causing obstruction of valves that regulate blood flow in veins. Small veins that have been occluded by a thrombosis may re-canalize (opening up

Causes and symptoms

The symptoms of chronic venous insufficiency can be subjective and objective. Subjective symptoms include throbbing, cramping, burning sensations, and leg **fatigue**. Patients can also develop chronic leg ulcers that may not heal. Varicose veins in the legs can bleed (since veins are delicate structures with thin walls) and cause death. Patients often develop fluid retention (**edema**) in the affected limb. Skin changes can occur and affected areas can become thin, shiny, discolored (blue-purple), and atrophic. The skin usually becomes thick and tough.

Diagnosis

There are several techniques used to diagnose venous disease. Electrical impedance plethysmography (IPG) provides a functional evaluation for outflow obstruction ultrasound (a machine that transmits sound waves) studies can visualize the venous system in certain areas. Another technique called duplex scanning can measure velocity within a vein.

Treatment

Periodic elevation of legs and bed rest can help with leg swelling. Patients are advised to avoid prolonged periods of standing or sitting. Wearing compression stockings can also reduce swelling of the leg. Mild skin infections can be treated with compresses, steroids, and, if infection is present, with **antibiotics**. Ulceration's can be treated with compresses, possible surgery, special ointments, and a semi-rigid boot that helps improve blood flow. Varicose veins can be treated with elastic stockings. About 15–20% of patients require surgery, but only after careful evaluation and specialized testing confirms a beneficial value.

Prognosis

The prognosis is variable and depends on the progression of disease, extent of damage, and the presence

KEY TERMS

Atrophic—A wasting of cells and tissues.

Thrombophlebitis—Venous inflammation with formation of a thrombus.

Thrombus—A clot in the cardiovascular system (the system that circulates blood throughout the body).

of other diseases, which may affect the cardiovascular system.

Prevention

Persons who have a strong family history, evidence of disease, and/or those who stand on their legs many hours daily should discuss the option of elastic stocking with their primary clinician.

Resources

BOOKS

- Goroll, Alan H., et al. *Primary Care Medicine*. 4th ed. Lippincott, Williams & Wilkins, 2000.
- Pfenninger, John L., et al, eds. *Procedures for Primary Care Physicians*. 1st ed. Mosby-Year Book, Inc., 1994.
- Rakel, Robert E., et al, eds. *Emergency Medicine: Concepts and Clinical Practice*. 4th ed. Mosby-Year Book, Inc., 1998.
- Townsend, Courtney M. *Sabiston Textbook of Surgery*. 16th ed. W. B. Saunders Company, 2001.

ORGANIZATION

American College of Angiology. 295 Northern Blvd., Ste. 104, Great Neck, NY 11021-4701.

Laith Farid Gulli, M.D.

Ventricular aneurysm

Definition

Ventricular aneurysm is a complication of a **heart attack** (myocardial infarction). It is a ballooning of a section of a blood vessel in the heart that first appears several days or weeks after an acute myocardial infarction.

Description

A myocardial infarction occurs when a section of the heart wall is deprived of blood and dies (undergoes

necrosis, or tissue **death**, and scarring). The heart wall is mainly muscle. It has two ventricles, the right and left ventricles, which pump blood to and from the lungs, and to the body. When part of the heart muscle dies, pumping power from that part of the wall is lost. After a myocardial infarction, the part of the heart wall that did not die must continue pumping blood and compensate for the dead muscle.

Ventricular aneurysm is one of the complications that follow a myocardial infarction.

An aneurysm is the outward swelling, or ballooning, of a blood vessel at a weak spot in the wall of the blood vessel. In the case of ventricular aneurysm, the aneurysm occurs in the wall of the heart at the spot where the myocardial infarction occurred. A scar usually forms in the area of the dead muscle tissue, and may eventually calcify. Ventricular aneurysms generally do not rupture. The left ventricle is involved in most cases of ventricular aneurysm.

Causes and symptoms

The principle symptom of a ventricular aneurysm is cardiac insufficiency, a condition in which not enough blood is being pumped to the body. Ventricular aneurysm is usually found after a large infarction in the muscle wall of a ventricle. Ventricular aneurysm is seldom seen immediately after a myocardial infarction. It takes several days or weeks to several months to develop. Frequently, recurrent ventricular irregular heartbeats (**arrhythmias**) and low cardiac output result from the presence of a ventricular aneurysm. Blood clots (thrombi) may form on the inside wall of the aneurysm and produce systemic blood clots that get stuck in a blood vessel (embolisms), which could lead to **stroke** or an ischemic leg (a usually painful condition in which lack of blood circulation leads to reduced function).

Diagnosis

A number of signs may indicate ventricular aneurysm, including an abnormal precordial impulse in the heartbeat, persistent elevation of the S-T segment of an electrocardiogram, and a characteristic bulge seen on the heart when x-rayed. The bulge is typically seen when the heart contracts, driving blood to the aorta, in the systolic phase of the heartbeat. Echolocation (**echocardiography** or ultrasound) can confirm the presence of an aneurysm. **Cardiac catheterization** may be performed to determine the extent of the aneurysm and the status of the coronary arteries. Stethoscopic examination reveals abnormal heart sounds, especially those associated with a backflow of blood from the left ventricle to the left atrium in systole or contraction beat (mitral regurgitation). This heart murmur is caused by the heart muscles no longer being able to properly operate the mitral valve.

KEY TERMS

Arrhythmia—A disturbance in the beating pattern of the heart.

Myocardial infarction—Commonly known as a heart attack, a myocardial infarction occurs when a part of the heart muscle is deprived of blood and dies.

Treatment

Most cases of ventricular aneurysm are treated by close medical follow-up and limiting patient activity. Surgical removal of the aneurysm is an option when persistent left ventricular failure or arrhythmia occurs, and the aneurysm is large. **Vasodilators**, **diuretics**, and digoxin are used to treat **heart failure**. Anticoagulant drugs are used to prevent the formation of blood clots. **Antiarhythmic drugs** are used to treat heart arrhythmias.

Prognosis

Ventricular aneurysm occurs more frequently than is commonly thought. Based on postmortem examination, ventricular aneurysm occurs in as many as 15% of myocardial infarction cases. Patients with a large ventricular aneurysm in the left ventricle have a reduced survival rate. Many patients have mild symptoms which are not life-threatening. The survival rate is dependent on the function of the left ventricle.

Resources

BOOKS

- Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill, 1998.
 Gibler, W. B., and T. P. Aufderheide. *Emergency Cardiac Care*. St. Louis: Mosby, 1994.
 Giuliani, E. R., et al. *Mayo Clinic Practice of Cardiology*. 3rd ed. St. Louis: Mosby, 1996.

John T. Lohr, PhD

Ventricular assist device

Definition

A ventricular assist device (VAD) is a mechanical pump used for temporary blood circulation support. It

decreases the workload of the heart while maintaining adequate flow and blood pressure.

Purpose

A VAD is a temporary life-sustaining device. VADs can replace the left ventricle (LVAD), the right ventricle (RVAD), or both ventricles (BIVAD). They are used when the heart muscle is damaged and needs to rest in order to heal or when blood flow from the heart is inadequate. VADs can also be used as a bridge in patients awaiting **heart transplantation** or in patients who have rejected a transplanted heart.

Examples of patients who might be candidates for a VAD are those who:

- have suffered a massive heart attack
- cannot be weaned from heart-lung bypass after treatment with intravenous fluids, medications, and insertion of a balloon pump in the aorta
- have an infection in the heart wall that does not respond to conventional treatment
- are awaiting a heart transplant and are unresponsive to drug therapy and intravenous fluids
- are undergoing high-risk procedures to clear the blockages in a coronary artery

Although one in five people suffer left side ventricular failure, only a minority are candidates for VADs. To be considered for a VAD, patients must meet specific criteria concerning blood flow, blood pressure, and general health.

Precautions

Poor candidates for a VAD include those with:

- irreversible renal failure
- severe disease of the vascular system of the brain
- cancer that has spread (metastasized)
- severe liver disease
- blood clotting disorders
- severe lung disease
- infections that do not respond to antibiotics
- extreme youth or age

Description

There are four types of VADs, each appropriate for a different condition. Surgery to install a VAD is performed under general anesthesia in a hospital operating room. An incision is made in the chest, then catheters are inserted into the heart and the correct artery. The surgeon

KEY TERMS

Coronary blood vessels—The arteries and veins that supply blood to the heart muscle.

Diaphragm—The muscle that separates the chest cavity from the abdominal cavity.

Ventricle—The heart has four chambers. The right and left ventricles are at the bottom of the heart and act as the body's main pumps.

sutures the catheters in place, then attaches tubing to connect the catheters to the pump. The pump stays outside the body. Once it is turned on, blood flows out of the diseased ventricle and into the pump, then is returned to the correct blood vessel leaving the heart.

Preparation

Before the operation the patient meets with an anesthesiologist to determine any special conditions that will affect the administration of anesthesia. Standard preoperative blood and urine studies are performed, and the heart is monitored both before and during the operation with an electrocardiograph.

Aftercare

The patient is monitored in intensive care, with follow-up blood, urine, and neurological studies. Blood thinning medications are given to prevent blood clotting.

Except for those patients awaiting a heart transplant, patients are slowly and gradually weaned from the VAD. Even when patients no longer need the VAD, they will require supportive drug therapy and/or a balloon pump inserted in the aorta.

Risks

VAD insertion carries risks of severe complications. Bleeding from surgery is common and occurs in as many as 30-50% of patients. Other complications include the development of blood clots, partial **paralysis** of the diaphragm, **respiratory failure**, kidney failure, failure of the VAD, damage to the coronary blood vessels, **stroke**, and infection.

Sometimes when the left ventricle is supported, the right ventricle begins to need assistance. If VADs are inserted in both ventricles, the heart may become so dependent on their support that they cannot be removed.

Normal results

Because conditions for which VADs are used vary widely and because of the high risks associated with VAD insertion, the outcome of surgery cannot be predicted.

Resources

BOOKS

"Ventricular Assist Device." In *The Patient's Guide to Medical Tests*, ed. Barry L. Zaret, et al. Boston: Houghton Mifflin, 1997.

OTHER

"Ventricular Assist Devices." Department of Biological and Agricultural Engineering. New York State University <<http://www.bae.ncsu.edu>>.

Tish Davidson

Ventricular ectopic beats

Definition

A ventricular ectopic beat (VEB) is an extra heart-beat originating in the lower chamber of the heart. This beat, also called a premature ventricular contraction (PVC), occurs before the beat triggered by the heart's normal function.

Description

Ventricular ectopic beats are common and do not indicate a problem in people without heart disease. However, if a person has aortic stenosis, **heart failure**, or a previous **heart attack**, VEBs may be followed by **ventricular tachycardia** and fibrillation, which can lead to sudden **death**.

Causes and symptoms

Although the origin of a VEB is well documented, the exact cause or causes are not well understood. Some physicians believe the beat is caused by a trigger of specific origin, while other physicians believe the beat is random. Occasional ventricular ectopic beats occur in healthy people. If there is no evidence of heart disease, there is little or no danger to the individual.

A single ventricular ectopic beat has very little effect on the pumping ability of the heart and usually does not cause any symptoms. If a symptom is felt, it is the feeling of a strong or skipped beat, often described as a thump, kick, or flip-flop. Sometimes, the sensation is referred to as a fullness in the neck.

KEY TERMS

Angioplasty—A surgical procedure which dilates a narrowed or blocked part of an artery.

Aortic stenosis—A stiffening of the artery which carries blood from the heart to the body.

Beta-blockers—A class of medication used to block the cellular response to chemicals normally present in the body.

Coronary artery—The vessel which brings blood to the muscle of the heart.

Fibrillation—Rapid, uncoordinated quivering of the heart.

Heart failure—A term used when the heart is unable to pump enough blood to supply the needs of the body.

Diagnosis

Ventricular ectopic beats are easily seen on an electrocardiogram.

Treatment

If a person is otherwise healthy, the only treatment needed is to decrease **stress** and limit the use of alcohol and **caffeine**. Cold medicines, available without prescription, sometimes contain drugs (e.g., **decongestants**) that stimulate the heart and should be used with caution.

If symptoms are uncomfortable, or the pattern of VEBs indicates a problem, the physician may prescribe drug therapy. Beta-blockers are quite safe and are usually tried first.

A person who has a history of heart attack or heart disease, and is experiencing frequent or complex VEBs, is at greater risk of sudden death. Drug therapy with beta-blockers will be recommended. In addition, **angioplasty** or coronary artery bypass surgery may relieve any underlying coronary artery blockage and reduce the danger of sudden death.

Treatment with **antiarrhythmic drugs** can suppress VEBs, but they can also increase the risk of a fatal abnormal rhythm. Often, extensive electrophysiologic testing and risk evaluation will be done before this method of treatment is prescribed.

Prognosis

In healthy people, VEBs are inconsequential. If the person with heart disease is able to find an effective

means of controlling ventricular ectopic beats, the outlook is good.

Prevention

Occasional ventricular ectopic beats in healthy people do not need to be prevented. People with a history of heart disease can usually control VEBs with medication.

Resources

BOOKS

McGoon, Michael D., ed. *Mayo Clinic Heart Book: The Ultimate Guide to Heart Health*. New York: William Morrow and Co., Inc., 1993.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

Dorothy Elinor Stonely

Ventricular failure see **Heart failure**

Ventricular fibrillation

Definition

Ventricular fibrillation is a very rapid, uncoordinated, ineffective series of contractions throughout the lower chambers of the heart. Unless stopped, these chaotic impulses are fatal.

Description

When the ventricles begin to quiver, and do not employ coordinated contractions, the heart is said to be fibrillating. In this condition the ventricles cannot pump blood from the heart. Ventricular fibrillation (V-fib) is the worst kind of abnormal heart rhythm, and is a form of cardiac arrest. It involves the pumping of the lower chambers of the heart, while atrial fibrillation involves the upper chambers.

Causes and symptoms

Ventricular fibrillation is often associated with acute ischemic events (**ischemia** involves the deprivation of oxygenated blood to an area of tissue), and with chronic ischemic heart disease. It is frequently seen immediately following a **heart attack**. It may also develop during hypoxia, atrial fibrillation, or improper grounding of electrical devices. An extremely low level of potassium in the blood can also cause ventricular fibrillation.

KEY TERMS

Atrial fibrillation—A condition in which the upper chambers of the heart quiver instead of contracting effectively

Cardiopulmonary resuscitation (CPR)—Using rescue breathing and chest compressions to help a person whose breathing and heartbeat have stopped

Cardioversion—An electrical shock delivered to the heart to restore a normal rhythm

Electrocardiogram—A visual representation of the heart beat

Heart failure—A term used when the heart is unable to pump enough blood to supply the needs of the body

Hypoxia—Insufficient oxygen in the cells of the body

Ischemic—Insufficient blood reaching the tissues

The first, and usually the only, symptom of V-fib is sudden unconsciousness.

Diagnosis

When an individual suddenly collapses, the possibility of ventricular fibrillation should be considered immediately. A quick assessment usually shows no pulse or heartbeat. The diagnosis of ventricular fibrillation is confirmed with an electrocardiogram.

Treatment

Basic life support with standard **cardiopulmonary resuscitation (CPR)** must be started within a few minutes, followed as soon as possible with **cardioversion**. Cardioversion is an electric shock delivered to the heart to stop the fibrillating. Early **defibrillation** is the key to survival. If left untreated, irreversible brain damage, due to lack of oxygen to the brain, occurs after about five minutes. After the heart resumes its normal rhythm, medications are given to help maintain the rhythm.

Prognosis

Early and effective CPR may provide the time necessary for medical personnel to arrive with a defibrillator. If a defibrillator is able to promptly restore a normal rhythm, up to 25% of victims are able to leave the hospital without evidence of brain damage.

If ventricular fibrillation occurs in the hospital in conjunction with a heart attack, defibrillation has a 95% success rate. If shock and **heart failure** are present at the time, even with immediate defibrillation, only about 30% of those stricken are successfully restored to a normal heart rate.

Prevention

A healthy lifestyle to reduce the risk of heart diseases which lead to ventricular fibrillation is the best prevention. For people who have experienced an episode of V-fib, an internal cardioverter-defibrillator may prevent further episodes.

Resources

BOOKS

McGoon, Michael D., ed. *Mayo Clinic Heart Book: The Ultimate Guide to Heart Health*. New York: William Morrow and Co., Inc., 1993.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

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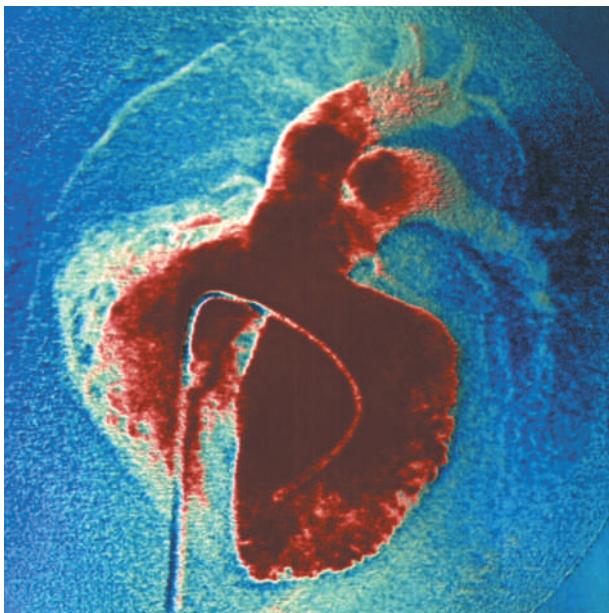
Ventricular septal defect

Definition

A ventricular septal defect is a hole in the wall of the heart (septum) that separates the left lower chamber (left ventricle) from the right lower chamber (right ventricle). The hole allows blood to flow from the left ventricle to the right ventricle instead of entering the aorta for distribution throughout the body. Ventricular septal defect is one of a group of heart problems found in newborn babies that are collectively called **congenital heart disease**.

Description

The heart has four chambers. The two lower chambers are called ventricles and are responsible for pumping blood. The right ventricle pumps blood to the lungs and the left ventricle pumps blood throughout the body. If there is a hole in the septum that separates the two ventricles, blood from the left ventricle can enter the right ventricle. This blood recycles through the lungs before returning to the left ventricle. This results in less oxygenated blood reaching the body. If the hole is sufficiently large, the lack of oxygen being delivered to the body



An angiogram of a ventricular septal defect. This is a hole in the ventricular septum causing blood to flow from the left ventricle (right of image) to the right ventricle and to the lungs. The bent catheter at the center, which is used to take the angiogram, passes through the hole between the ventricles. (Photograph by Simon Fraser, Photo Researchers, Inc. Reproduced by permission.)

can cause severe problems, including **heart failure** and breathlessness. Approximately 0.7% of all babies have a congenital heart defect. Of these, 20% have a ventricular septal defect.

Causes and symptoms

Congenital heart defects are errors in the development of the heart structure. They occur early in the life of the embryo. There is no known cause of congenital heart defects. They can be associated with several diseases, such as German measles (**rubella**) and **Down syndrome**. Genetics does not seem to play a role in ventricular septal defect. People with a heart defect do not have an increased chance of passing it on to their children.

Symptoms result from a reduced amount of oxygen going to the body. Symptoms are proportional to the size of the defect. They may appear at any time in the life of the child. In cases where the hole in the septum is very small, few or no symptoms may appear and the child may develop normally. In cases where the ventricular septal defect is large, the newborn will show signs of heavy breathing, sweating, and feeding difficulties. Children with this defect tire easily. Ventricular septal defect can also result in stunted growth resulting from insufficient oxygen being delivered to the growing

KEY TERMS

Echocardiogram—An image of the heart produced by an instrument that uses sound waves to create an image of the heart.

Electrocardiogram—A graph of the heart's beating action.

Endocarditis—An inflammation of the interior lining of the heart that is frequently caused by infectious agents.

body. Children with ventricular septal defect tend to suffer more frequent colds and **pneumonia**, and have a higher rate of inflammation and infection of the heart (**endocarditis**).

Diagnosis

The condition is first suspected based on observation of the child. The physician will listen to the heart with a stethoscope (auscultation) to detect a heart murmur. X rays, electrocardiogram (ECG), and **echocardiography** can all be used to evaluate ventricular septal defect.

Treatment

Most small holes close without treatment. Often, as the child grows, the hole closes or becomes smaller. If the hole is large or fails to close, the child is usually treated with drugs. Holes that persist and are causing problems in development are corrected by open heart surgery. Usually, surgery is performed after one year of age, but before the child enters school. This allows time for a trial of drug therapy, which could potentially eliminate the need for surgery. The operation is generally safe.

Prognosis

Children with small septal defects tend to develop normally and without any effect on their ability to participate in physical activities. Surgery allows children with larger defects to live nearly normal lives.

Resources

BOOKS

Alexander, R. W., R. C. Schlant, and V. Fuster, eds. *The Heart*. 9th ed. New York: McGraw-Hill, 1998.

Berkow, Robert, ed. *Merck Manual of Medical Information*.

Whitehouse Station, NJ: Merck Research Laboratories, 1997.

OTHER

"Ventricular Septal Defect." *The Merck Page*. 13 Apr. 1998
<<http://www.merck.com>>.

John T. Lohr, PhD

Ventricular shunt

Definition

Ventricular shunt is a surgical procedure in which a tube is placed in one of the fluid-filled chambers inside the brain (ventricles). The fluid around the brain and the spinal column is called the cerebrospinal fluid. When infection or disease causes an excess of this cerebrospinal fluid in the ventricles, the shunt is placed to drain it and thereby relieve excess pressure.

Purpose

Ventricular shunt relieves **hydrocephalus**, a condition in which the ventricles are enlarged. In hydrocephalus, pressure from the cerebrospinal fluid usually increases. It may be caused by tumor of the brain or of the membranes covering the brain (meninges), infection of or bleeding into the cerebrospinal fluid, or inborn malformations of the brain. Symptoms of hydrocephalus may include **headache**, personality disturbances and loss of intellectual abilities (**dementia**), problems in walking, irritability, vomiting, abnormal eye movements, or a low level of consciousness.

Normal pressure hydrocephalus is associated with progressive dementia, problems in walking, and loss of bladder control (**urinary incontinence**). Even though the cerebrospinal fluid is not thought to be under increased pressure in this condition, it may also be treated by ventricular shunting.

Precautions

As with any surgical procedure, the surgeon must know about any medications or health problems that may increase the patient's risk. Because infections are both common and serious complications, **antibiotics** are often given before and after surgery.

Description

The ventricular shunt tube is placed to drain fluid from the ventricular system in the brain to the cavity of the abdomen or to the large vein in the neck (jugular vein). Therefore, surgical procedures must be done both

KEY TERMS

Cerebrospinal fluid—Fluid bathing the brain and spinal cord.

Computed tomography (CT) scan—An imaging technique in which cross-sectional x rays of the body are compiled to create a three-dimensional image of the body's internal structures.

Dementia—Progressive loss of mental abilities.

Magnetic resonance imaging (MRI)—An imaging technique that uses a large circular magnet and radio waves to generate signals from atoms in the body. These signals are used to construct images of internal structures.

in the brain and at the drainage site. The tubing contains valves to insure that fluid can only flow out of the brain and not back into it. The valve can be set at a desired pressure to allow cerebrospinal fluid to escape whenever the pressure level is exceeded.

A small reservoir may be attached to the tubing and placed under the scalp. This reservoir allows samples of cerebrospinal fluid to be removed with a syringe to check the pressure. Fluid from the reservoir can also be examined for bacteria, **cancer** cells, blood, or protein, depending on the cause of hydrocephalus. The reservoir may also be used to inject antibiotics for cerebrospinal fluid infection or **chemotherapy** medication for meningeal tumors.

Preparation

The diagnosis of hydrocephalus should be confirmed by diagnostic techniques that make images of the brain, such as computed tomography scan (CT scan) or **magnetic resonance imaging (MRI)**, before the shunting procedure is performed. These techniques will also show any associated brain abnormalities. Cerebrospinal fluid should be examined if infection or tumor of the meninges is suspected. Patients with dementia or **mental retardation** should undergo neuropsychological testing to establish a baseline psychological profile before the shunting procedure.

Patients with normal pressure hydrocephalus may experience a temporary improvement in walking and mental abilities upon removal of a moderate amount of cerebrospinal fluid. This improvement may be an indication that shunting will improve their condition. However, patients who do not improve after temporary cerebrospinal fluid drainage may still benefit from ventricular shunt. When a case is in doubt, continuous monitor-

ing of cerebrospinal fluid pressure (which in itself requires a surgical procedure) may indicate whether shunting is likely to be helpful.

Aftercare

To avoid infections at the shunt site, the area should be kept clean. Cerebrospinal fluid should be checked periodically by the doctor to be sure there is no infection or bleeding into the shunt. Cerebrospinal fluid pressure should be checked to be sure the shunt is operating properly. The eyes should be examined regularly because shunt failure may damage the nerve to the eyes (optic nerve). If not treated promptly, damage to the optic nerve causes irreversible loss of vision. Patients or caregivers should understand the life-threatening nature of shunt problems. All symptoms and signs of potential shunt failure or infection must be taken seriously.

Risks

Complications of shunting occur in 30% of cases, but only 5% are serious. Serious and long-term complications are bleeding under the outermost covering of the brain (**subdural hematoma**), infection, **stroke**, and shunt failure. Infection at the shunt site may cause a loss of intelligence. When shunts drain to the abdomen (ventriculoperitoneal shunts), fluid may accumulate in the abdomen or abdominal organs may be injured. If cerebrospinal fluid pressure is lowered too much, patients may have severe headaches, often with **nausea and vomiting**, whenever they sit up or stand.

Normal results

Of patients with normal pressure hydrocephalus who are treated with shunting, 25-80% experience long-term improvement. Normal pressure hydrocephalus is more likely to improve when it is caused by infection of or bleeding into the cerebrospinal fluid than when it occurs without an underlying cause. Walking difficulties and bladder control are more likely to improve than dementia is.

After shunting, the ventricles get smaller within three or four days. This shrinkage occurs even when hydrocephalus has been present for a year or more. Clinically detectable signs of improvement occur within a few weeks. The cause of hydrocephalus, duration of hydrocephalus before shunting, and associated brain abnormalities affect the outcome.

Resources

BOOKS

Black, P. M. "The Normal Pressure Hydrocephalus Syndrome." In *Concepts in Neurosurgery: Hydrocephalus*, ed. R. M. Scott. Baltimore: William & Wilkins, 1990.

PERIODICALS

- McLone, D. G., and K. E. Aronyk. "An Approach to the Management of Arrested and Compensated Hydrocephalus. (Review)." *Pediatric Neurosurgery* 19, no. 2 (1993): 101-103.
 Raftopoulos, C., et al. "Prospective Analysis by Computed Tomography and Long-Term Outcome of 23 Adult Patients with Chronic Idiopathic Hydrocephalus." *Neurosurgery* 38 (1996): 51-59.
 Vanneste, J., et al. "Shunting Normal-Pressure Hydrocephalus: Do the Benefits Outweigh the Risk? A Multicenter Study and Literature Review." *Neurology* 42 (1992): 54-59.

ORGANIZATIONS

American Academy of Neurology. 1080 Montreal Ave., St. Paul, MN 55116. (612) 695-1940. <<http://www.aan.com>>.

Laurie Barclay, MD

Ventricular tachycardia

Definition

Ventricular tachycardia (V-tach) is a rapid heart beat that originates in one of the lower chambers (the ventricles) of the heart. To be classified as tachycardia, the heart rate is usually at least 100 beats per minute.

Description

A rapid heart rate can originate in either the left or right ventricle. Ventricular tachycardia which lasts more than 30 seconds is referred to as sustained ventricular tachycardia. A period of three to five rapid beats is called a salvo, and six beats or more lasting less than 30 seconds is called nonsustained ventricular tachycardia. Rapid ventricular rhythms are more serious than rapid atrial rhythms because they make the heart extremely inefficient. They also tend to cause more severe symptoms, and have a much greater tendency to result in **death**.

Although generally considered to be among the life-threatening abnormal rhythms, harmless forms of sustained V-tach do exist. These occur in people without any structural heart disease.

Causes and symptoms

Most ventricular tachycardias are associated with serious heart disease such as coronary artery blockage, cardiomyopathy, or **valvular heart disease**. V-tach is often triggered by an extra beat originating in either the right or left ventricle. It also occurs frequently in connection with a **heart attack**. V-tach commonly occurs within 24 hours of the start of the attack. It must be treated

KEY TERMS

Atrial—Having to do with the upper chambers of the heart.

Cardiomyopathy—A disease of the heart muscle.

Cardioversion—A electrical shock delivered to the heart to restore a normal rhythm.

Coronary artery—The artery that supplies blood to the heart muscle itself.

Electrocardiogram—A visual representation of the heart beat.

Fibrillation—Rapid, uncoordinated, quivering of the heart.

Palpitations—Uncomfortable feeling of the heart beat in the chest.

Valvular—Having to do with the valves inside the heart.

quickly to prevent fibrillation. After 48 to 72 hours of the heart attack, the risk of ventricular tachycardia is small. However, people who have suffered severe damage to the larger anterior wall of the heart have a second danger period, because V-tach often occurs during convalescence from this type of heart attack.

Sustained ventricular tachycardia prevents the ventricles from filling adequately so the heart can not pump normally. This results in loss of blood pressure, and can lead to a loss of consciousness and to **heart failure**.

The individual with V-tach almost always experiences palpitation, though some episodes cause no symptoms at all.

Diagnosis

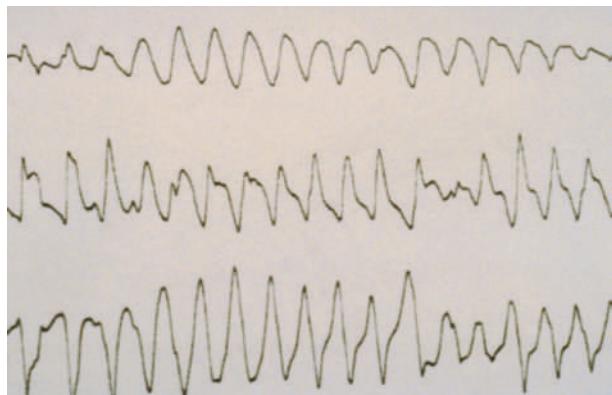
Diagnosis is easily made with an electrocardiogram.

Treatment

Any episode of ventricular tachycardia that causes symptoms needs to be treated. An episode that lasts more than 30 seconds, even without symptoms, also needs to be treated. Drug therapy can be given intravenously to suppress episodes of V-tach. If blood pressure falls below normal, a person will need electric **cardioversion** (“shock”) immediately.

Prognosis

With appropriate drug or surgical treatment, ventricular tachycardia can be controlled in most people.



An electrocardiographic image indicating a rapid heart beat.
(Custom Medical Stock Photo. Reproduced by permission.)

Prevention

A person susceptible to sustained ventricular tachycardia often has a small abnormal area in the ventricles that is the source of the trigger event. This area can sometimes be surgically removed. If surgery is not an option, and drug therapy is not effective, a device called an automatic cardioverter-defibrillator may be implanted.

Resources

BOOKS

McGoon, Michael D., ed. *Mayo Clinic Heart Book: The Ultimate Guide to Heart Health*. New York: William Morrow and Co., Inc., 1993.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

Dorothy Elinor Stonely

Verrucae see **Warts**

Vertigo see **Dizziness**

Vesicle see **Skin lesions**

Vesicoureteral reflux

Definition

Vesicoureteral reflux (VUR) refers to a condition in which urine flows from the bladder, back up the ureter, and back into the kidneys.

Description

The normal flow of urine begins in the collecting system of each kidney. Urine then flows out of each kidney and into a tube called the ureter. Each ureter leads into the bladder, where the urine collects until it is passed out of the body. Normally, urine should flow only in this direction. In vesicoureteral reflux, however, urine that has already collected in the bladder is able to flow backwards from the bladder, up the ureter, and back into the collecting system of the kidney. VUR may be present in either one or both ureters.

Vesicoureteral reflux causes damage to the kidneys in two ways:

- The kidney is not designed to withstand very much pressure. When VUR is present, backpressure of the urine on the kidney is significant. This can damage the kidney.
- The kidney is usually sterile, meaning that no bacteria are normally present within it. In VUR, bacteria that enter through the urinary tract may be carried back up the ureter with the urine. These bacteria can enter the kidney, causing severe infection.

Causes and symptoms

Most cases of VUR are due to a defect in the way the ureter is implanted into the bladder. The angle may be wrong, or the valve (which should allow urine only one-way entrance into the bladder) may be weak. Structural defects of the urinary system may also cause VUR. These include a situation in which two ureters leave a kidney, instead of the usual one (duplicated ureters), and in which the ureter is greatly enlarged at the end leading into the bladder (ureterocele).

VUR alone does not usually cause symptoms. Symptoms develop when an infection has set in. The usual symptoms of infection include frequent need to urinate, **pain** or burning with urination, and blood or pus in the urine. Occasionally, VUR is suspected when a child has a difficult time becoming toilet trained. In these cases, the bladder may become irritable and spasm, because it is never totally empty of urine. When the kidneys have been damaged, high blood pressure may develop.

Diagnosis

VUR is diagnosed by taking a series of x-ray pictures. These are taken after putting a small tube (catheter) into the bladder. The bladder is then filled with a dye solution which lights up on the x-ray picture. Pictures are taken immediately, followed by x rays taken while the patient is urinating. This will allow reflux to be demonstrated, and will reveal whether the level of reflux increases

when pressure increases during urination. Reflux is then graded based on the height and effects of the VUR:

- Grade I. VUR enters just the portion of the ureter closest to the bladder. The ureter appears normal in size.
- Grade II. VUR enters the entire ureter, and goes up into the collecting system of the kidney. The ureter and the collecting system appear normal in size and structure.
- Grade III. VUR enters the entire ureter and kidney collecting system. Either the ureter or the collecting system are abnormal in size or shape.
- Grade IV. Similar to Grade III, but the ureter is greatly enlarged.
- Grade V. Similar to Grade IV, but the ureter is also abnormally twisted/curved, and the collecting system is greatly enlarged, with absence of the usual structural details.

Treatment

Treatment depends on the grade that is diagnosed. In grades I and II, the usual treatment involves long-term use of a small daily dose of **antibiotics** to prevent the development of infections. The urine is tested regularly to make sure that no infection occurs. The kidneys are evaluated regularly to make sure that they are growing normally and that no new scarring has occurred. Grade III VUR can be treated with antibiotics and careful monitoring. New infections, scarring, or stunting of kidney growth may result in a need for surgery. Grades IV and V are extremely likely to require surgery.

Surgery for VUR consists of reimplanting the ureters into the bladder at a more normal angle. This usually improves the functioning of the valve leading into the bladder. When structural defects of the urinary system are present, surgery will almost always be required to repair these defects.

Prognosis

Prognosis is dependent on the grade of VUR. About 80% of children with grades I and II VUR simply grow out of the problem. As they grow, the ureter lengthens, changing its angle of entry into the bladder. About 50% of children with grade III VUR will require surgery. Nearly all children with grades IV and V VUR will require surgery. In these cases, it is usually best to perform surgery at a relatively young age, in order to avoid damage and scarring to the kidneys.

Prevention

While there is no known method of preventing VUR, it is important to note that a high number of the siblings of

KEY TERMS

Bladder—The muscular sac which receives urine from the kidneys, stores it, and ultimately works to remove it from the body during urination.

Reflux—A condition in which flow is backwards from normal.

Ureter—A muscular tube leading from the kidney to the bladder, down which the urine flows.

children with VUR will also have VUR. Many of these siblings (about 36%) will have no symptoms, but will be discovered through routine examinations prompted by their brother's or sister's problems. It is important to identify these children, so that antibiotic treatment can be used to prevent the development of infection and kidney damage.

Resources

BOOKS

Francoeur, D., et al. "Urologic Problems." In *Pediatric and Adolescent Gynecology*, ed. J. S. Sanfilippo, et al. Philadelphia: W. B. Saunders Co., 1994.

Gonzalez, Richard. "Vesicoureteral Reflux." In *Nelson Textbook of Pediatrics*, ed. Richard E. Behrman. Philadelphia: W. B. Saunders Co., 1996.

PERIODICALS

Connolly, L. P., et al. "Vesicoureteral Reflux in Children: Incidence and Severity in Siblings." *Journal of Urology* 157, no. 6 (June 1997): 2287+.

Greenfield, S. P., et al. "Experience with Vesicoureteral Reflux in Children: Clinical Characteristics." *Journal of Urology* 158, no. 2 (Aug. 1997): 574+.

Manzoni, G., and E. Merlini. "Vesico-Ureteral Reflux in 1996." *Paediatric Urology* 6, no. 6 (Nov. 1996): 301+.

ORGANIZATIONS

American Foundation for Urologic Disease. 300 West Pratt St., Suite 401, Baltimore, MD 21201. (800) 242-2383.

National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC). 3 Information Way, Bethesda, MD 20892-3580. (800) 891-5388. <<http://www.niddk.nih.gov/health/urolog/pubs/kuorg/kuorg.htm>>.

Rosalyn Carson-DeWitt, MD

Vestibulitis see **Labyrinthitis**

Viagra see **Sildenafil citrate**

Vibrio cholera infection see **Cholera**

Vibrio parahemolyticus infection see
Vibriosis

Vibriosis

Definition

Vibriosis is a disease caused by an infection with bacteria of the *Vibrio* genus, most commonly *Vibrio parahemolyticus* or *Vibrio vulnificus*. *Vibrio* bacteria cause **diarrhea**, skin infections, and/or blood infections. The diarrhea-causing *Vibrio parahemolyticus* is a relatively harmless infection, but *Vibrio vulnificus* infection, though rare, can lead to blood **poisoning** and **death** in many cases.

Description

Vibriosis is a general term referring to an infection by any member of the large group of *Vibrio* bacteria. The bacteria that causes **cholera** is in this group. Alternate names include non-cholera *Vibrio* infection, *Vibrio parahemolyticus* infection, and *Vibrio vulnificus* infection.

Vibrio parahemolyticus and *Vibrio vulnificus* are found in salt water. Infection with either of these two bacteria primarily occurs through eating contaminated raw seafood. Raw oysters are the usual source, although other seafood can carry the bacteria.

Vibrio parahemolyticus causes severe diarrhea. *Vibrio vulnificus* may cause diarrhea, but in persons with an underlying disease it may cause severe blood infections (septicemia or blood poisoning). Contact of a wound with seawater or contaminated seafood can lead to a *Vibrio vulnificus* skin infection.

Vibriosis is not very common in the United States. Most cases occur in coastal states between June and October. Between 1988 and 1991, there were only 21 reported cases of *Vibrio parahemolyticus* infection in the United States. Between 1988 and 1995, there were over 300 reports of *Vibrio vulnificus* infection in the United States.

Causes and symptoms

Vibriosis is caused by eating seafood contaminated with *Vibrio parahemolyticus* or *Vibrio vulnificus*. These bacteria damage the inner wall of the intestine, which causes diarrhea and related symptoms. *Vibrio vulnificus* can get through the intestinal wall and into the bloodstream.

Persons at risk for severe, often fatal vibriosis include those with liver disease (**cirrhosis**), excess iron (**hemochromatosis**), **thalassemia** (a blood disorder), **AIDS**, diabetes, or those who are immunosuppressed.

Symptoms of intestinal infection occur within two days of eating contaminated seafood. Symptoms last for

two to 10 days and include watery diarrhea, abdominal cramps, nausea, vomiting, **headache**, and possibly **fever**. Symptoms of a blood infection develop one to two days after eating contaminated seafood, and include fever, chills, low blood pressure, and large fluid-filled blisters on the arms or legs. Similar blisters can also be produced by a *Vibrio vulnificus* skin infection.

Diagnosis

Vibriosis can be diagnosed and treated by an infectious disease specialist. It is diagnosed when *Vibrio* bacteria are grown from samples of stool, blood, or blister fluid. The symptoms and a recent history of eating raw seafood are very important clues for diagnosis.

Treatment

To counteract the fluid loss resulting from diarrhea, the patient will receive fluids either by mouth or intravenously. **Antibiotics** are not helpful in treating *Vibrio parahemolyticus* diarrhea.

However, *Vibrio vulnificus* infections are treated with antibiotics such as tetracycline (Sumycin, Achromycin V), or doxycycline (Monodox) plus cefazidime (Ceftaz, Fortraz, Tazicef). One out of five patients with vibriosis requires hospitalization.

Prognosis

Most healthy persons completely recover from diarrhea caused by *Vibrio* bacteria. *Vibrio vulnificus* blood infection affects persons with underlying illness and is fatal in half of those cases. *Vibrio vulnificus* wound infections are fatal in one quarter of the cases.

Prevention

Contamination with *Vibrio* bacteria does not change the look, smell, or taste of the seafood. Vibriosis can be prevented by avoiding raw or undercooked shellfish, keeping raw shellfish and its juices away from cooked foods, and avoiding contact of wounded skin with seawater or raw seafood.

Resources

BOOKS

Sack, David A. "Cholera and Related Illnesses Caused by *Vibrio* Species and *Aeromonas*." In *Infectious Diseases*, ed. Sherwood L. Gorbach, et al. Philadelphia: W. B. Saunders Co., 1998.

PERIODICALS

Kumamoto, Kenneth S., and David J. Vukich. "Clinical Infections of *Vibrio vulnificus*: A Case Report and Review of

the Literature." *The Journal of Emergency Medicine* 16, no. 1 (1998): 61-66.

OTHER

Center for Food Safety and Applied Nutrition. <<http://vm.cfsan.fda.gov>>.

Belinda Rowland, PhD

Viral diarrhea see **Rotavirus infections**

Viral meningitis see **Meningitis**

Visceral | see **Roundworm infections**

Vision training

Definition

Vision training, also known as vision therapy or orthoptics, consists of a variety of programs to enhance visual performance. It includes treatments for focusing, binocularity, and eye movement problems. Vision training is generally provided by an optometrist (O.D.).

Purpose

While visual acuity refers to how clearly each eye can see, vision training addresses how well the two eyes work together as a team. When looking at an object, the eyes must focus on the object (e.g., focusing for near or far objects). This involves the lens system of the eyes. The eyes must also work as a team and point at the same object so that the person does not see double. Aiming precisely at the same object will aid in depth perception (stereopsis) and seeing objects in three-dimensions (3D).

Although crossed eyes (**strabismus**) is an obvious condition, many defects in the coordination of eye movement are far less apparent. Even so, they can cause problems in reading, driving vehicles, and other complex tasks that require the integrated function of eyes and body. It is the goal of vision therapy to improve these subtle interactions using carefully devised exercises and devices.

The discipline, called "behavioral optometry," involves a careful evaluation of visual function, concentrating on complex skills such as rapid reading, distance perception, peripheral field awareness, accommodative facility, and the coordinated movement of each eye in relationship to the other. From that assessment the doctor goes on to design a course of exercises to correct the problems discovered. Like any other type of training, success requires practice and persistence until habits and reflexes can be retrained.

There are a number of different techniques and instruments used in vision therapy; the field is evolving rapidly in many directions. Some computerized exercises are being developed that promise better patient motivation. A device called the Dynavision apparatus, has produced positive results in retraining **stroke** victims to operate motor vehicles. And traditional forms of vision therapy have increased reading efficiency in an older age group (62 to 75 years).

Because the goal of vision training is to improve visual efficiency and visual processing, people having problems reading should consider a vision training evaluation. Children rubbing their eyes while reading, avoiding reading, or getting headaches while reading should be evaluated. Problems with sustaining focusing (accommodative insufficiency) or problems keeping words single (convergence or divergence problems) may be present. A full eye-health evaluation and vision training workup may reveal a problem. Vision training is also appropriate for people learning how to coordinate the eyes after surgery for strabismus. Vision training can also be used in lazy eye (**amblyopia**) and includes patching the eye and doing various exercises.

Dyslexia is a problem with following the flow of words when reading. Often the order of letters or words is reversed. It is a complex problem involving the way the brain processes the stream of information coming in from the eyes. While vision therapy is not a treatment for dyslexia or learning disabilities, there may be an underlying visual processing problem that may be present. Vision therapy can be part of a multidisciplinary approach to treating learning disabilities.

Sports vision deals with visual performance in sport-related activities. Protective eyewear is also a large consideration when participating in sports. Basketball, baseball, racquetball, and swimming (and other sports as well) can all cause injury to the eyes. Batting helmets with face shields, protective goggles with polycarbonate lenses, or something as simple as ultraviolet (UV) coatings on glasses to protect the eyes from the sun in outdoor sports such as golf can protect the eyes. Hitting a baseball or throwing a basketball into a hoop requires accurate fixation. Golfers need to see clearly and judge distance. Bifocals may need to be adjusted to allow for putting, driving, and reading the score card. While many of these issues (e.g., UV coatings) can be addressed at a regular eye exam, sports vision may be able to help with more specific, individual problems.

Precautions

Behavioral optometry is a relatively new field of study. Results are mixed. Newer techniques, more refined

evaluation methods, and newer pieces of apparatus are continuously being appraised. More study results are needed to define the scope and benefits of this discipline.

Description

Vision therapy is individually tailored to the subject and the discovered problems. It can be a lengthy process with many variations that requires repetition until eye muscles, coordination, reflexes, habits, and the way the brain handles visual input are all retrained. Each program will be individualized. The patient should be aware of the time involved for treatment. Treatment can be from several weeks to several months depending upon the condition. Some insurance plans may cover vision training.

Preparation

If vision therapy is recommended, the optometrist will discuss thoroughly what is expected and necessary for success. The patient must be prepared to perform some eye exercises at home.

Aftercare

Even after the treatment is successful, it may be necessary to continue the exercises to maintain the benefits. It may be necessary to repeat treatment in the future.

Risks

No risk is involved. The treatment is safe.

Normal results

A carefully and individually tailored program of vision therapy should result in a gradual improvement in whatever complex visual function is being addressed. This progress ought to be measurable by using the same tests that were used to diagnose it. If the patient had symptoms, such as headaches or double vision while reading, it should be alleviated.

Abnormal results

Because the treatment is safe, the only abnormal result is failure. At the start of treatment, the optometrist should provide a reasonable estimate of what improvement to expect and how long it will take. Should this prove incorrect, either the treatment needs to be modified or the problem deemed untreatable by that method.

Resources

PERIODICALS

- Birnbaum, M. H. "Behavioral Optometry: A Historical Perspective." *Journal of the American Optometric Association* 65, no. 4 (Apr. 1994): 255-64.

KEY TERMS

Accommodation—The focusing of the lens of the eye.

Binocular—Both eyes accurately pointing to the same object.

Stereopsis—The visual perception of depth, or the ability to see three-dimensionally. For this to occur, the person must be binocular.

Gallaway, M., and M. Schieman. "The Efficacy of Vision Therapy for Convergence Excess." *Journal of the American Optometric Association* 68, no. 2 (Feb. 1997): 81-6.

Garriott, R. S., C. L. Heyman, and M. W. Rouse. "Role of Optometric Vision Therapy for Surgically Treated Strabismus Patients." *Optometry & Vision Science* 74, no. 4 (Apr. 1997): 179-84.

Groffman, S. "Motivational Factors in Vision Therapy: Comparison of Computerized vs. Manipulative Techniques." *Journal of the American Optometric Association* 67, no. 6 (June 1996): 344-9.

Klavora, P., et al. "The Effects of Dynavision Rehabilitation on Behind-the-Wheel Driving Ability and Selected Psychomotor Abilities of Persons After Stroke." *American Journal of Occupational Therapy* 49, no. 6 (June 1995): 534-542.

Klavora, P., and M. Warren. "Rehabilitation of Visuomotor Skills in Poststroke Patients Using the Dynavision Apparatus." *Perceptual and Motor Skills* 86, no. 1 (Feb. 1998): 23-30.

Kulp, M. T., and P. P. Schmidt. "Effect of Oculomotor and Other Visual Skills on Reading Performance: A Literature Review." *Optometry & Vision Science* 73, no. 4 (Apr. 1996): 283-92.

Russell, G. E., and B. Wick. "A Prospective Study of Treatment of Accommodative Insufficiency." *Optometry & Vision Science* 70, no. 2 (Feb. 1993): 131-5.

Solan, H. A., J. Feldman, and L. Tujak. "Developing Visual and Reading Efficiency in Older Adults." *Optometry & Vision Science* 72, no. 2 (Feb. 1995): 139-45.

Wood, J. M., and B. Abernethy. "An Assessment of the Efficacy of Sports Vision Training Programs." *Optometry & Vision Science* 74, no. 8 (Aug. 1997): 646-59.

ORGANIZATIONS

American Optometric Association. 243 North Lindbergh Blvd., St. Louis, MO 63141. (314) 991-4100. <<http://www.aoanet.org>>.

Prevent Blindness America. 500 East Remington Road, Schaumburg, IL 60173. (800) 331-2020. <<http://www.preventblindness.org>>.

J. Ricker Polsdorfer, MD

Visual evoked potential study see **Evoked potential studies**

Visual impairment

Definition

Total blindness is the inability to tell light from dark, or the total inability to see. Visual impairment or low vision is a severe reduction in vision that can't be corrected with standard glasses or contact lenses and reduces a person's ability to function at certain or all tasks. Legal blindness (which is actually a severe visual impairment) refers to a best-corrected central vision of 20/200 or worse in the better eye or a visual acuity of better than 20/200 but with a visual field no greater than 20° (e.g., side vision that is so reduced that it appears as if the person is looking through a tunnel).

Description

Vision is normally measured using a Snellen chart. A Snellen chart has letters of different sizes that are read, one eye at a time, from a distance of 20 ft. People with normal vision are able to read the 20 ft line at 20 ft—20/20 vision—or the 40 ft line at 40 ft, the 100 ft line at 100 ft, and so forth. If at 20 ft the smallest readable letter is larger, vision is designated as the distance from the chart over the size of the smallest letter that can be read.

Eye care professionals measure vision in many ways. Clarity (sharpness) of vision indicates how well a person's central visual status is. The diopter is the unit of measure for refractive errors such as nearsightedness, farsightedness, and **astigmatism** and indicates the strength of corrective lenses needed. People do not just see straight ahead; the entire area of vision is called the visual field. Some people have good vision (e.g., see clearly) but have areas of reduced or no vision (blind spots) in parts of their visual field. Others have good vision in the center but poor vision around the edges (peripheral visual field). People with very poor vision may be able only to count fingers at a given distance from their eyes. This distance becomes the measure of their ability to see.

The World Health Organization (WHO) defines impaired vision in five categories:

- Low vision 1 is a best corrected visual acuity of 20/70.
- Low vision 2 starts at 20/200.
- Blindness 3 is below 20/400.
- Blindness 4 is worse than 5/300

- Blindness 5 is no light perception at all.
- A visual field between 5° and 10° (compared with a normal visual field of about 120°) goes into category 3; less than 5° into category 4, even if the tiny spot of central vision is perfect.

Color blindness is the reduced ability to perceive certain colors, usually red and green. It is a hereditary defect and affects very few tasks. Contrast sensitivity describes the ability to distinguish one object from another. A person with reduced contrast sensitivity may have problems seeing things in the fog because of the decrease in contrast between the object and the fog.

According to the WHO there are over forty million people worldwide whose vision is category 3 or worse, 80% of whom live in developing countries. Half of the blind population in the United States is over 65 years of age.

Causes and symptoms

The leading causes of blindness include:

- macular degeneration
- glaucoma
- cataracts
- diabetes mellitus

Other possible causes include infections, injury, or nutrition.

Infections

Most infectious eye diseases have been eliminated in the industrialized nations by sanitation, medication, and public health measures. Viral infections are the main exception to this statement. Some infections that may lead to visual impairment include:

- Herpes simplex keratitis. A viral infection of the cornea. Repeated occurrences may lead to corneal scarring.
- Trachoma. This disease is responsible for six to nine million cases of blindness around the world, of the third of a billion who have the disease. Trachoma is caused by an incomplete bacterium, *Chlamydia trachomatis*, that is easily treated with standard antibiotics. It is transmitted directly from eye to eye, mostly by flies. The chlamydia gradually destroy the cornea.
- Leprosy (Hansen's disease). This is another bacterial disease that has a high affinity for the eyes. It, too, can be effectively treated with medicines.
- River blindness. Much of the tropics of the Eastern Hemisphere are infested with *Onchocerca volvulus*, a worm that causes "river blindness." This worm is transmitted by fly bites and can be treated with a drug called

ivermectin. Nevertheless, twenty-eight million people have the disease, and 40% of them are blind from it.

Other causes

Exposure of a pregnant woman to certain diseases (e.g., rubella or toxoplasmosis) can cause congenital eye problems. Injuries to the eyes can result in blindness. Very little blindness is due to disease in the brain or the optic nerves. **Multiple sclerosis** and similar nervous system diseases, brain tumors, diseases of the eye sockets, and head injuries are rare causes of blindness.

Nutrition

Vitamin A deficiency is a widespread cause of corneal degeneration in children in developing nations. As many as five million children develop xerophthalmia from this deficiency each year. Five percent end up blind.

Diagnosis

A low vision exam is slightly different from a general exam. While a case history, visual status, and eye health evaluation are common to both exams, some things do differ. Eye charts other than a Snellen eye chart will be used. Testing distance will vary. A trial frame worn by the patient is usually used instead of the instrument containing the lenses the patient sits behind (phoropter). Because the low vision exam is slightly more goal oriented than a general exam, for example, what specifically is the patient having trouble with (reading, seeing street signs, etc.) different optical and nonoptical aids will generally be tried. Eye health is the last thing to be checked so that the lights necessary to examine the eyes won't interfere with the rest of the testing.

Treatment

There are many options for patients with visual impairment. There are optical and nonoptical aids. Optical aids include:

- Telescopes. May be used to read street signs.
- Hand magnifiers. May be used to read labels on things at the store.
- Stand magnifiers. May be used to read.
- Prisms. May be used to move the image onto a healthy part of the retina in some eye diseases.
- Closed circuit television (CCTV). For large magnification (e.g., for reading).

Nonoptical aids can include large print books and magazines, check-writing guides, large print dials on the telephone, and more.

For those who are blind, there are enormous resources available to improve the quality of life. For the legally blind, financial assistance for help may be possible. Braille and audio books are increasingly available. Guide dogs provide well-trained eyes and independence. Orientation and mobility training is available. There are special schools for blind children and access to disability support through Social Security and private institutions.

Prognosis

The prognosis generally relates to the severity of the impairment and the ability of the aids to correct it. A good low vision exam is important to be aware of the latest low vision aids.

Prevention

Regular eye exams are important to detect silent eye problems (e.g., glaucoma). Left untreated, glaucoma can result in blindness.

Corneal infections can be treated with effective antibiotics. When a cornea has become opaque beyond recovery it must be transplanted. Good hygiene (e.g., washing hands frequently) to prevent infection, proper use of contact lenses, and not sharing makeup are just some ways to guard against corneal infections.

Cataracts should be removed when they interfere with a person's quality of life.

Primary prevention addresses the causes before they ever begin. Fly control can be accomplished by simple sanitation methods. Public health measures can reduce the incidence of many infectious diseases. Vitamin A supplementation (when appropriate) will eliminate xerophthalmia completely. It is possible that protecting the eyes against ultraviolet (UV) light will reduce the incidence of cataracts, macular degeneration, and some other eye diseases. UV coatings can be placed on regular glasses, sunglasses, and ski goggles. Patients should ask their eye care professional about UV coatings. Protective goggles should also be worn in certain situations (e.g., certain jobs, sports, even mowing the lawn).

Secondary prevention addresses treating established diseases before they cause irreversible eye damage. Having general physical checkups can also detect systemic diseases such as diabetes or high blood pressure. Control of diabetes is very important in preserving sight.

Resources

BOOKS

Bennett, J. Claude, and Fred Plum, eds. *Cecil Textbook of Medicine*. Philadelphia: W. B. Saunders Co., 1996.

KEY TERMS

Cornea—The clear dome-shaped structure that's part of the front of the eye. It lies in front of the colored part of the eye (iris).

Diabetic retinopathy—Retinal disease caused by the damage diabetes does to small blood vessels.

Phoropter—The instrument used to measure refractive status of the eyes. It contains many lenses which are then changed in front of the eyes while the patient is looking at an eye chart. This is when the doctor usually asks, "Which is better, one or two?"

Xerophthalmia—A drying of the cornea and conjunctiva.

Riordan-Eva, Paul. "Blindness." In *General Ophthalmology*.

13th ed. Ed. Daniel Vaughan. Stamford: Appleton & Lange, 1993.

Sardegna, Jill Otis, and T. Paul, *The Encyclopedia of Blindness and Vision Impairment*. New York: Facts on File, Inc., 1990.

ORGANIZATIONS

American Academy of Ophthalmology. 655 Beach Street, P.O. Box 7424, San Francisco, CA 94120-7424. <<http://www.eyenet.org>>.

American Foundation for the Blind. 11 Penn Plaza, Suite 300, New York, NY 10001. (800) 232-5463.

Guide Dogs for the Blind. P.O. Box 1200, San Rafael, CA 94915. (415) 499-4000.

International Eye Foundation. 7801 Norfolk Ave., Bethesda, MD 20814. (301) 986-1830.

The Lighthouse National Center for Education. 111 E. 59th Street. New York, NY 10022. (800) 334-5497.

National Association for the Visually Handicapped. 22 West 21st St., New York, NY 10010. (212) 889-3141.

National Center For Sight. (800) 221-3004.

National Children's Eye Care Foundation. One Clinic Center, A3-108, Cleveland, OH 44195. (216) 444-0488.

National Eye Institute. 2020 Vision Place, Bethesda, MD 20892-3655. (301) 496-5248. <<http://www.nei.nih.gov>>.

National Federation of the Blind. 1800 Johnson St., Baltimore, MD 21230. (301) 569-9314.

Prevent Blindness America. 500 East Remington Road, Schaumburg, IL 60173. (800) 331-2020. <<http://www.preventblindness.org>>.

Research to Prevent Blindness. 598 Madison Ave., New York, NY 10022. (212) 363-3911.

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Visualization see **Guided imagery**

Vitamin A deficiency

Definition

Vitamin A deficiency exists when the chronic failure to eat sufficient amounts of vitamin A or beta-carotene results in levels of blood-serum vitamin A that are below a defined range. Beta-carotene is a form of pre-vitamin A, which is readily converted to vitamin A in the body. Night blindness is the first symptom of vitamin A deficiency. Prolonged and severe vitamin A deficiency can produce total and irreversible blindness.

Description

Vitamin A (called retinol in mammals) is a fat-soluble vitamin. The recommended dietary allowance (RDA) for vitamin A is 1.0 mg/day for the adult man and 0.8 mg/day for the adult woman. Since beta-carotene is converted to vitamin A in the body, the body's requirement for vitamin A can be supplied entirely by beta-carotene. Six mg of beta-carotene are considered to be the equivalent of 1 mg of vitamin A. The best sources of vitamin A are eggs, milk, butter, liver, and fish, such as herring, sardines, and tuna. Beef is a poor source of vitamin A. Plants do not contain vitamin A, but they do contain beta-carotene and other carotenoids. The best sources of beta-carotene are dark-green, orange, and yellow vegetables; spinach, carrots, oranges, and sweet potatoes are excellent examples. Cereals are poor sources of beta-carotene.

Vitamin A is used for two functions in the body. Used in the eye, it is a component of the eye's light-sensitive parts, containing rods and cones, that allow for night-vision or for seeing in dim-light circumstances. Vitamin A (retinol) occurs in the rods. Another form of Vitamin A, retinoic acid, is used in the body for regulating the development of various tissues, such as the cells of the skin, and the lining of the lungs and intestines. Vitamin A is important during embryological development, since, without vitamin A, the fertilized egg cannot develop into a fetus.

Causes and symptoms

Vitamin A deficiency occurs with the chronic consumption of **diets** that are deficient in both vitamin A and beta-carotene. When vitamin A deficiency exists in the developed world, it tends to happen in alcoholics or in people with diseases that affect the intestine's ability to absorb fat. Examples of such diseases are **celiac disease** (chronic nutritional disorder), **cystic fibrosis**, and **cholestasis** (bile-flow failure or interference). Vitamin A deficiency occurred in infants during the early 1900s in

Denmark. The deficiency resulted when milk fat was made into butter for export, leaving the by-product (skimmed milk) for infant feeding. Vitamin A deficiency has taken place in infants in impoverished populations in India, where the only foods fed to the infants were low in beta-carotene. Vitamin A deficiency is also common in areas like Southeast Asia, where polished rice, which lacks the vitamin, is a major part of the diet.

The earliest symptom of vitamin A deficiency is night blindness. Prolonged deficiency results in drying of the conjunctiva (the mucous membrane that lines the inner surface of the eyelids and extends over the forepart of the eyeball). With continued vitamin A deficiency, the drying extends to the cornea (xerophthalmia). The cornea eventually shrivels up and becomes ulcerated (keratinomalacia). Superficial, foamy gray triangular spots may appear in the white of the eye (Bitot's spots). Finally, inflammation and infection occur in the interior of the eye, resulting in total and irreversible blindness.

Diagnosis

Vitamin A status is measured by tests for retinol. Blood-serum retinol concentrations of 30-60 mg/dl are considered in the normal range. Levels that fall below this range indicate vitamin A deficiency. Night blindness is measured by a technique called electroretinography. Xerophthalmia, keratinomalacia, and Bitot's spots are diagnosed visually by trained medical personnel.

Treatment

Vitamin A deficiency can be prevented or treated by taking vitamin supplements or by getting injections of the vitamin. The specific doses given are oral retinyl palmitate (110 mg), retinyl acetate (66 mg), or injected retinyl palmitate (55 mg) administered on each of two successive days, and once a few weeks later if symptoms are not relieved.

Prognosis

The prognosis for correcting night blindness is excellent. Xerophthalmia can be corrected with vitamin A therapy. Ulcerations, tissue **death**, and total blindness, caused by severe vitamin A deficiency, cannot be treated with vitamin A.

Prevention

Vitamin A deficiency can be prevented by including foods rich in vitamin A or beta-carotene as a regular component of the diet; liver, meat, eggs, milk, and dairy products are examples. Foods rich in beta-carotene include red

KEY TERMS

Bitot's spots—Bitot's spots are superficial, foamy gray, triangular spots on the white of the eyeball.

Carotenoids—Carotenoids are yellow to deep-red pigments.

Conjunctiva—The conjunctiva is a clear layer of cells that covers the eye and directly contacts the atmosphere. The conjunctiva is about five-cells thick.

Cornea—The cornea is a clear layer of cells that covers the eye, just under the conjunctiva. The cornea is about 50-cells thick.

Fat-soluble vitamin—Fat-soluble vitamins can be dissolved in oil or in melted fat. Water-soluble vitamins can be dissolved in water or juice.

Keratinomalacia—Keratinomalacia is ulceration of the cornea.

Recommended Dietary Allowance (RDA)—The Recommended Dietary Allowances are quantities of nutrients in the diet that are required to maintain good health in people. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences, and may be revised every few years. A separate RDA value exists for each nutrient. The RDA values refer to the amount of nutrient expected to maintain good health in people. The actual amounts of each nutrient required to maintain good health in specific individuals differ from person to person.

Xerophthalmia—Xerophthalmia is a dry, thickened, lusterless condition of the eyeball resulting from vitamin A deficiency.

peppers, carrots, pumpkins, as well as those just mentioned. Margarine is rich in beta-carotene, because this chemical is used as a coloring agent in margarine production. In Africa, Indonesia, and the Philippines, vitamin A deficiency is prevented by public health programs that supply children with injections of the vitamin.

Resources

BOOKS

- Brody, T. *Nutritional Biochemistry*. San Diego: Academic Press, Inc., 1998.
 Combs, G. *The Vitamins*. San Diego: Academic Press, Inc., 1992.
 Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

- Filteau, S. M., and A. M. Tomkins."Vitamin A Supplementation in Developing Countries." *Archives of Disease in Childhood* 72 (1995): 106-109.

Tom Brody, PhD

Vitamin B₁ see **Beriberi**

Vitamin B₂ deficiency see **Riboflavin deficiency**

Vitamin B₆ deficiency

Definition

Vitamin B₆ is used by the body as a catalyst in reactions that involve amino acids. Vitamin B₆ deficiency is rare, since most foods eaten contain the vitamin.

Description

Vitamin B₆ is a water-soluble vitamin. The recommended dietary allowance (RDA) for vitamin B₆ is 2.0 mg/day for the adult man and 1.6 mg/day for the adult woman. Vitamin B₆ in the diet generally occurs as a form called pyridoxal phosphate. In this form, it cannot be absorbed by the body. During the process of digestion, the phosphate group is removed, and pyridoxal is produced. However, the body readily absorbs pyridoxal, and converts it back to the active form of the vitamin (pyridoxal phosphate).

Poultry, fish, liver, and eggs are good sources of vitamin B₆, comprising about 3-4 mg vitamin/kg food; meat and milk contain lesser amounts of the vitamin. The vitamin also occurs, at about half this level, in a variety of plant foods, including beans, broccoli, cabbage, and peas. Vitamin B₆ tends to be destroyed with prolonged cooking, with storage, or with exposure to light.

As mentioned, vitamin B₆ takes various forms. One of these forms, called pyridoxine, is relatively stable. For this reason, pyridoxine is the form of vitamin B₆ that is used in vitamin supplements, or when foods are fortified. Apples and other fruits are poor sources of the vitamin, containing only 0.2-0.6 mg vitamin/kg food.

Vitamin B₆, used mainly in the body for the processing of amino acids, performs this task along with certain enzymes. The enzyme that participates in this type of complex is aminotransferase. Several types of aminotransferase exist. With vitamin B₆ deficiency, while aminotransferase continues to occur in the various organs of the body,

KEY TERMS

Amino acid—Amino acids are small molecules that are used as building blocks for all proteins. Some amino acids are also used in the body for the manufacture of hormones. There are about 20 nutritionally important amino acids, including glutamic acid, glycine, methionine, lysine, tryptophan, serine, and glycine.

Fat-soluble vitamins—Fat-soluble vitamins can be dissolved in oil or in melted fat.

Recommended Dietary Allowance (RDA)—The Recommended Dietary Allowances (RDAs) are quantities of nutrients in the diet that are required to maintain good health in people. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences, and may be revised every few years. A separate RDA value exists for each nutrient. The RDA values refer to the amount of nutrient expected to maintain good health in people. The actual amounts of each nutrient required to maintain good health in specific individuals differ from person to person.

Water-soluble vitamins—Water-soluble vitamins can be dissolved in water or juice.

there is an abnormally low level of the active vitamin B₆/aminotransferase complex present. Thus, this vitamin deficiency results in the impairment of a variety of activities in the body. With supplement correction of the vitamin B₆ deficiency, the aminotransferase then readily forms the active complex, and normal metabolism is restored.

Vitamin B₆ converts certain amino acids (glutamic acid, aspartic acid, glycine) to energy. This allows the body to process all dietary protein, even when the dietary protein is in excess of the body's needs. Vitamin B₆ also allows the body to synthesize certain amino acids. For example, if the diet is deficient or low in certain amino acids, such as glycine or serine, vitamin B₆ enables the body to make them from sugar. Vitamin B₆ is used also for the synthesis of certain hormones, such as adrenaline.

Causes and symptoms

Vitamin B₆ deficiency occurs rarely. When it does, it is usually associated with poor absorption of nutrients in the gastrointestinal tract (as in **alcoholism**, or with chronic **diarrhea**), the taking of certain drugs (as isoniazid, hydralazine, penicillamine) that inactivate the vita-

min, with genetic disorders that inhibit metabolism of the vitamin, or in cases of **starvation**.

The symptoms of vitamin B₆ deficiency in adults are only vaguely defined. These include nervousness, irritability, **insomnia**, muscle weakness, and difficulty in walking. Vitamin B₆ deficiency may produce fissures and cracking at the corners of the mouth. The deficiency occurred in infants fed early versions of commercial canned infant formula, when the vitamin had been inadvertently omitted from the formula. This error resulted in infants failing to grow, in irritability, and in seizures.

Diagnosis

Vitamin B₆ status is measured by the transaminase stimulation test. This test requires extraction of red blood cells, and placement of the cells in two test tubes. Special chemicals (reagents) are added to both test tubes to allow for measurement of aminotransferase. This enzyme requires pyridoxal phosphate. A known quantity of pure pyridoxal phosphate is added to one of the test tubes. The activity level of the enzyme is measured, and compared, in both test tubes. If the added pyridoxal phosphate did not stimulate activity, the patient is considered not to be deficient in vitamin B₆. Neither is the patient considered deficient if only slight stimulation occurred. But if a stimulation of four-fold or more occurred, a vitamin B₆ deficiency is present.

Treatment

Vitamin B₆ deficiency can be prevented or treated with consumption of the recommended dietary allowance, as supplied by food or by vitamin supplements.

Prognosis

The prognosis for correcting vitamin B₆ deficiency is excellent.

Prevention

Vitamin B₆ deficiency is not a major concern for most people. The deficiency can be prevented with consumption of a mixed diet that includes poultry, fish, eggs, meat, vegetables, and grains.

Resources

BOOKS

- Brody, T. *Nutritional Biochemistry*. San Diego: Academic Press, Inc., 1998.
- Combs, G. *The Vitamins*. San Diego: Academic Press, Inc., 1992.
- Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

"Intakes of B Vitamins from Diet and Supplements." *Nutrition Research Newsletter* (Apr. 1997): 46.

Tom Brody, PhD

Vitamin B₁₂ deficiency anemia see
Pernicious anemia

Vitamin C deficiency see **Scurvy**

Vitamin D deficiency

Definition

Vitamin D deficiency exists when the concentration of 25-hydroxy-vitamin D (25-OH-D) in the blood serum occurs at 12 ng/ml (nanograms/milliliter), or less. The normal concentration of 25-hydroxy-vitamin D in the blood serum is 25-50 ng/ml. When vitamin D deficiency continues for many months in growing children, the disease commonly referred to as rickets will occur. A prolonged deficiency of the vitamin in adults results in osteomalacia. Both diseases involve defects in bones.

Description

Vitamin D is a fat-soluble vitamin, meaning it is able to be dissolved in fat. While some vitamin D is supplied by the diet, most of it is made in the body. To make vitamin D, cholesterol, a sterol that is widely distributed in animal tissues and occurs in the yolk of eggs, as well as in various oils and fats, is necessary. Once cholesterol is available in the body, a slight alteration in the cholesterol molecule occurs, with one change taking place in the skin. This alteration requires the energy of sunlight (or ultraviolet light). Vitamin D deficiency, as well as rickets and osteomalacia, tends to occur in persons who do not get enough sunlight and who fail to eat foods that are rich in vitamin D.

Once consumed, or made in the body, vitamin D is further altered to produce a hormone called 1,25-dihydroxy-vitamin D (1,25-diOH-D). The conversion of vitamin D to 1,25-diOH-D does not occur in the skin, but in the liver and kidney. First, vitamin D is converted to 25-OH-D in the liver; it then enters the bloodstream, where it is taken-up by the kidneys. At this point, it is converted to 1,25-diOH-D. Therefore, the manufacture of 1,25-diOH-D requires the participation of various organs of the body—the liver, kidney, and skin.

The purpose of 1,25-diOH-D in the body is to keep the concentration of calcium at a constant level in the

bloodstream. The maintenance of calcium at a constant level is absolutely required for human life to exist, since dissolved calcium is required for nerves and muscles to work. One of the ways in which 1,25-diOH-D accomplishes this mission is by stimulating the absorption of dietary calcium by the intestines.

The sequence of events that can lead to vitamin D deficiency, then to bone disease, is as follows: a lack of vitamin D in the body creates an inability to manufacture 1,25-diOH-D, which results in decreased absorption of dietary calcium and increased loss of calcium in the feces. When this happens, the bones are affected. Vitamin D deficiency results in a lack of bone mineralization (calcification) in growing persons, or in an increased demineralization (decalcification) of bone in adults.

Causes and symptoms

Vitamin D deficiency can be caused by conditions that result in little exposure to sunlight. These conditions include: living in northern countries; having dark skin; being elderly or an infant, and having little chance to go outside; and covering one's face and body, such as for religious reasons. Many Arab women cover the entire body with black cloth, and wear a veil and black gloves when they go outside. These women may acquire vitamin D deficiency, even though they live in a sunny climate.

Most foods contain little or no vitamin D. As a result, sunshine is often a deciding factor in whether vitamin D deficiency occurs. Although fortified milk and fortified infant formula contain high levels of vitamin D, human breast milk is rather low in the vitamin. The term fortified means that **vitamins** are added to the food by the manufacturer.

To say that a food is high or low in vitamin D means how much of that food needs to be eaten in order to prevent vitamin deficiency and maintain good health. An exact meaning can be provided by comparing the Recommended Dietary Allowance of vitamin D with the amount of vitamin D supplied by a particular food per day. The Recommended Dietary Allowance, also referred to as RDA, is a recommendation based on data derived from different population groups and ages. The RDA for vitamin D for adults is 200 International Units (IU) per day, and can be supplied by eating approximately 1.5 kg of beef, 2.0 kg of corn oil, or 100 kg of cabbage. Few people, though, would want to eat a kilogram of beef in one day, and no human being is capable of eating 100 kg of cabbage in a day; therefore, these foods are poor sources of vitamin D. However, saltwater fish such as salmon, herring, and sardines are rich in vitamin D, supplied from the oils produced by these fish. The RDA can also be supplied by eating roughly 50 g of salmon or 2.0 g of cod liver oil,

and since fortified milk contains 400 IU per quart, half a quart of milk provides the RDA. For comparison, human breast milk contains only 4 to 60 IU per quart.

No harm is likely to result from vitamin D deficiency that occurs for only a few days a year. If the deficiency occurs for a period of many months or years, however, rickets or osteomalacia may develop. The symptoms of rickets include bowed legs and bowed arms. The bowed appearance is due to the softening of bones, and their bending if the bones are weight-bearing. Bone growth occurs through the creation of new cartilage, a soft substance at the ends of bones. When the mineral calcium phosphate is deposited onto the cartilage, a hard structure is created. In vitamin D deficiency, though, calcium is not available to create hardened bone, and the result is soft bone. Other symptoms of rickets include particular bony bumps on the ribs called rachitic rosary (beadlike prominences at the junction of the ribs with their cartilages) and knock-knees. Seizures may also occasionally occur in a child with rickets, because of reduced levels of dissolved calcium in the bloodstream.

Although osteomalacia is rare in the United States, symptoms of this disease include reduced bone strength, an increase in bone **fractures**, and sometimes bone **pain**, muscle weakness, and a waddling walk.

Diagnosis

Vitamin D deficiency is diagnosed by measuring the level of 25-hydroxy-vitamin D in the blood serum. The normal level or concentration of this form of the vitamin ranges from 25-50 ng/ml. Deficiency occurs when this level decreases to about 12 ng/ml or less. As mentioned previously, 25-OH-D is not the active form of the vitamin. It must be converted to 1,25-diOH-D in order to cause responses in various organs of the body. However, the levels of vitamin D, or of 1,25-dihydroxy-vitamin D in the blood, do not give a reliable picture of whether a person is deficient in the vitamin. For this reason, they are not measured when testing for vitamin D deficiency.

Rickets is diagnosed by x-ray examination of leg bones. A distinct pattern of irregularities, abnormalities, and a coarse appearance can be clearly seen with rickets. Osteomalacia is also diagnosed with x-ray examination. Measurements of blood plasma 25-OH-D, blood plasma calcium, and blood plasma parathyroid hormone must also be obtained for the diagnosis of these diseases. Parathyroid hormone and 1,25-diOH-D work together in the body to regulate the levels of calcium in the blood.

Treatment

Rickets heals promptly with 4,000 IU of oral vitamin D per day administered for approximately one

month. During this treatment, the doctor should monitor the levels of 25-OH-D in the plasma to make certain they are raised to a normal value. The bone abnormalities (visible by x ray) generally disappear gradually over a period of 3-9 months. Parents are instructed to take their infants outdoors for approximately 20 minutes per day with their faces exposed. Children should also be encouraged to play outside. Foods that are good sources of vitamin D include cod liver oil, egg yolks, butter, and oily fish. Some foods, including milk and breakfast cereals, are also fortified with synthetic vitamin D.

Osteomalacia is treated by eating 2,500 IU per day of vitamin D for about three months. Measurements of 25-OH-D, calcium, and parathyroid hormone should be obtained after the treatment period to make sure the therapy did, in fact, result in normal blood values.

Care must be taken in treating vitamin D deficiency, since high doses of vitamin D are toxic and can result in the permanent deposit of **minerals** in the heart, lungs, and kidneys. Symptoms of toxicity are nausea, vomiting, pain in joints, and lack of interest in eating food. In adults, vitamin D toxicity occurs with eating 50,000 IU or more per day. In infants, toxicity occurs with 1,000 IU per day. The continued intake of toxic doses results in **death**.

Rickets and osteomalacia are almost always treated with oral supplements of vitamin D, with the recommendation to acquire daily exposure to direct sunlight. An alternative to sunlight is the use of an ultraviolet (UV) lamp. When using UV lamps, the eyes must be covered to protect them against damage. Many types of sunglasses allow UV light to pass through, so only those that are opaque to UV light should be used. Attempts to acquire sunlight through glass windows fail to help the body make vitamin D. This is because UV light does not pass through window glass.

Rickets may also occur with calcium deficiency, even when a child is regularly exposed to sunshine. This type of rickets has been found in various parts of Africa. The bone deformities are similar to, or are the same as, those that occur in typical rickets; however, calcium deficiency rickets is treated by increasing the amount of calcium in the diet. No amount of vitamin D can cure the rickets of a child with a diet that is extremely low in calcium. For this reason, it is recommended that calcium be given in conjunction with vitamin D supplementation.

Prognosis

The prognoses for correcting vitamin D deficiency, rickets, and osteomalacia are excellent. Vitamin D treatment results in the return of bone mineralization to a normal rate, the correction of low plasma calcium levels, the prevention of seizures, and a recovery from bone pain.

KEY TERMS

25-hydroxy-vitamin D—This is the form of vitamin D that is measured in order to assess vitamin D deficiency.

Cholesterol—A fat-soluble steroid alcohol (sterol) found in animal fats and oils, and in egg yolks. The human body needs cholesterol to produce vitamin D.

Fat-soluble vitamin—A vitamin that dissolves easily in fat or oil, but not in water. The fat-soluble vitamins are vitamins D, E, A, and K.

International unit (IU)—A measurement of biological activity in which one IU is equal to one mg (milligram).

Osteomalacia—Osteomalacia is a bone disease that occurs in adults and is caused by a prolonged period of vitamin D deficiency.

Rachitic rosary—Beadlike bumps present at the junction of the ribs with their cartilages—often seen in children with rickets.

Recommended Dietary Allowance (RDA)—The amount of nutrients, including vitamins, that should be supplied by foods on a daily basis to maintain normal health. Recommendations are based on data obtained from different population groups and ages.

Rickets—Rickets is a bone disease that occurs in infants and growing children and is caused by a prolonged period of vitamin D deficiency.

On the other hand, deformities such as bowed legs and the rachitic rosary persist throughout adult life.

Prevention

Food fortification has almost completely eliminated rickets in the United States. Vitamin D deficiency can be prevented by acquiring the RDA through drinking fortified milk and eating fortified cereals. For those who cannot drink milk, supplements of pills might be considered. In some older people, a 400 IU supplement may not be enough to result in the normal absorption of calcium; therefore, daily doses of 10,000 IU per day may be needed. For infants who are fed only breast milk (and rarely exposed to sunshine), a daily supplement of 200–300 IU is recommended.

Rickets continues to be a problem in Africans and Asian Indians who migrate to Canada or Great Britain,

especially where these immigrants do not drink fortified milk. Prevention of rickets in these populations is attempted through educational programs sponsored by the government.

Resources

BOOKS

Brody, Tom. "Vitamin D." In *Nutritional Biochemistry*. San Diego: Academic Press, 1994.

Collins, E. D., and Anthony Norman. "Vitamin D." In *Handbook of Vitamins*, ed. Lawrence Machlin. New York: Marcel Dekker, Inc., 1991.

Feldman, D. *Vitamin D*. San Diego: Academic Press, 1997.

Food and Nutrition Board. "Vitamin D." In *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

Binet, A., and S.W. Kooh. "Persistence of Vitamin D-Deficiency Rickets in Toronto in the 1990s." *Cancer Journal of Public Health* (July/Aug. 1996): 227-230.

El-Sonbaty, M. R., and N. Abdul-Ghaffar. "Vitamin D Deficiency in Veiled Kuwaiti Women." *European Journal of Clinical Nutrition* 50 (1996): 315-318.

Kinyamu, H., et al. "Serum Vitamin D Metabolites and Calcium Absorption in Normal Young and Elderly Free-Living Women and in Women Living in Nursing Homes." *American Journal of Clinical Nutrition* 65 (1997): 790-797.

Tom Brody, PhD

Vitamin E deficiency

Definition

Vitamin E deficiency is a very rare problem that results in damage to nerves. When vitamin E deficiency does occur, it strikes people with diseases that prevent the absorption of dietary fats and fat-soluble nutrients. Since vitamin E is a fat-soluble vitamin, it has some of the properties of fat.

Description

The recommended dietary allowance (RDA) for vitamin E is 10 mg/day for the adult man, 8 mg/day for the adult woman, and 3 mg/day for the infant. Vitamin E occurs in foods in a variety of related forms. The most potent and useful form of vitamin E is called alpha-tocopherol. The best sources of vitamin E are vegetable oils, such as corn oil, soy oil, and peanut oil. Animal fats, such as butter and lard, contain lower levels of the vitamin. Corn oil contains about 16 mg of alpha-tocopherol per 100

KEY TERMS

Fat-soluble vitamin—Fat-soluble vitamins can be dissolved in oil or in melted fat.

Recommended Dietary Allowance—The Recommended Dietary Allowances (RDAs) are quantities of nutrients in the diet that are required to maintain good health in people. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences, and may be revised every few years. A separate RDA value exists for each nutrient. The RDA values refer to the amount of nutrient expected to maintain good health in people. The actual amounts of each nutrient required to maintain good health in specific individuals differ from person to person.

Toxic oxygen—Oxygen is required for life, as it is needed for energy production. When oxygen is used by the body, most of it is converted to water. However, a small fraction of the oxygen breathed is converted to toxic oxygen. The body uses several different processes for preventing and repairing toxic-oxygen damage. One of these processes involves vitamin E.

Water-soluble vitamins—Water-soluble vitamins can be dissolved in water or juice.

g oil. Wheat-germ oil contains 120 mg alpha-tocopherol per 100 g oil. Fish, eggs, and beef contain relatively low levels of the vitamin, with about 1 mg per 100 g food.

Vitamin E seems to have only one function in the body: the prevention of the natural and continual process of deterioration of all body tissues. This deterioration is provoked by a number of causes; one of these is toxic oxygen. During the body's metabolism of atmospheric oxygen, toxic oxygen is produced continuously in the body by the formation of by-products. These toxic by-products include hydrogen peroxide, superoxide, and hypochlorite.

Hypochlorite is a natural product, produced by cells of the immune system. It is also the active component of bleach. Once formed, toxic oxygen can damage various parts of the body, such as the membranes which form the boundaries of every cell. Vitamin E serves the body in protecting membranes from toxic oxygen damage. In contrast, vitamin C serves to protect the aqueous, or watery, regions of the cell from toxic oxygen damage. The membranes that are most sensitive to toxic oxygen damage are the membranes of nerves; therefore, the main symptom of vitamin E deficiency is damage to the nervous system.

Causes and symptoms

As mentioned, when vitamin E deficiency occurs, it strikes people with diseases that prevent the absorption of dietary fats and fat-soluble nutrients. These diseases include **cystic fibrosis**, **pancreatitis**, and **cholestasis** (bile-flow obstruction). Bile salts, produced in the liver, are required for the absorption of fats. Cholestasis causes a decrease in the formation of bile salts and the consequent failure of the body to absorb dietary fats. For this reason, this disease may result in vitamin E deficiency. Premature infants may be at risk for vitamin E deficiency because they may be born with low tissue levels of the vitamin, and because they have a poorly developed capacity for absorbing dietary fats. Infants suffering from fat-malabsorption diseases can develop symptoms of vitamin E deficiency by age two. In adults, the onset of a fat-malabsorption disease can provoke vitamin E deficiency after a longer period, as an example, ten years.

Vitamin E deficiency in humans results in ataxia (poor muscle coordination with shaky movements), decreased sensation to vibration, lack of reflexes, and **paralysis** of eye muscles. One particularly severe symptom of vitamin E deficiency is the inability to walk.

Diagnosis

Vitamin E status is measured by assessment of the content of alpha-tocopherol in the blood plasma, using a method called high-pressure liquid chromatography. Blood plasma levels of alpha-tocopherol that are 5.0 mg/l, or above, indicate normal vitamin E status; levels below 5.0 mg/l indicate vitamin E deficiency.

Treatment

Vitamin E deficiency that occurs with cholestatic liver disease, or other malabsorption syndromes, can be treated with weekly injections of 100 mg alpha-tocopherol that may continue for six months. Vitamin E deficiency in premature infants may require treatment for only a few weeks.

Prognosis

The prognosis for correcting the neurological symptoms of vitamin E deficiency is fair to excellent.

Prevention

The prevention of vitamin E deficiency should not be a concern for most people, since the vitamin is found in a wide variety of foods. Attention has been given to the theory that vitamin E serves to protect against **cancer** and **atherosclerosis**. The evidence that normal levels of

vitamin E protect against atherosclerosis is fairly convincing. However, there is little or no proof that vitamin E intake, above and beyond the recommended daily allowance (RDA), can prevent cancer or atherosclerosis.

Resources

BOOKS

Brody, T. *Nutritional Biochemistry*. San Diego: Academic Press, Inc., 1998.

Combs, G. *The Vitamins*. San Diego: Academic Press, Inc., 1992.

Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

Tanyel, Mary C. Mahlon, and Louis D. Mancano. "Neurologic findings in vitamin E deficiency." *American Family Physician* (Jan. 1997): 197+.

"Vitamin E deficiency and progressive ataxia." *Nutrition Research Newsletter* (Mar. 1994): 30.

Tom Brody, PhD

Vitamin K plays an important role in blood clotting. Without the vitamin, even a small cut would cause continuous bleeding in the body, and **death**. Blood clotting is a process that begins automatically when any injury produces a tear in a blood vessel. The process of blood clotting involves a collection of molecules, which circulate continuously through the bloodstream. When an injury occurs, these molecules rapidly assemble and form the blood clot. The clotting factors are proteins, and include proteins called Factor II, Factor VII, Factor IX, and Factor X. Factor II is also called prothrombin. These proteins require vitamin K for their synthesis in the body. The blood-clotting process also requires a dozen other proteins that do not need vitamin K for their synthesis.

Causes and symptoms

Newborns are especially prone to vitamin K deficiency. A nursing-mother's milk is low in the vitamin; breast milk can supply only about 20% of the infant's requirement. Infants are born with low levels of vitamin K in their body; they do not have any vitamin K-producing bacteria in their intestines. Their digestive tracts are sterile. As a result, a form of vitamin K deficiency, called hemorrhagic disease of the newborn, may develop. This disease involves spontaneous bleeding beneath the skin or elsewhere in the infant's body, and occurs in about 1% of all infants. In rare cases, it causes death due to spontaneous bleeding in the brain.

Vitamin K deficiency in adults is rare. When it occurs, it is found in people with diseases that prevent the absorption of fat. These diseases include **cystic fibrosis**, **celiac disease**, and **cholestasis**. Vitamin K deficiency can exist in adults treated with antibiotics that kill the bacteria that normally live in the digestive tract. As mentioned, the intestine-bacteria supply part of our daily requirement of vitamin K. Vitamin K deficiency can result in bleeding gums, and in skin that is easily bruised.

Vitamin K deficiency

Definition

Vitamin K deficiency exists when chronic failure to eat sufficient amounts of vitamin K results in a tendency for spontaneous bleeding or in prolonged and excessive bleeding with trauma or injury. Vitamin K deficiency occurs also in newborn infants, as well as in people treated with certain **antibiotics**. The protein in the body most affected by vitamin K deficiency is a blood-clotting protein called prothrombin.

Description

Vitamin K is a fat-soluble vitamin. The recommended dietary allowance (RDA) for vitamin K is 80 mg/day for the adult man, 65 mg/day for the adult woman, and 5 mg/day for the newborn infant. The vitamin K present in plant foods is called phylloquinone; while the form of the vitamin present in animal foods is called menaquinone. Both of these **vitamins** are absorbed from the diet and converted to an active form called dihydrovitamin K.

Spinach, lettuce, broccoli, brussels sprouts, and cabbage are good sources of vitamin K, containing about 8 mg vitamin K/kg food. Cow milk is also a good source of the vitamin.

A portion of the body's vitamin K is supplied by bacteria living in the intestine rather than by dietary sources.

Diagnosis

Vitamin K status is measured by the **prothrombin time** test. The normal prothrombin time is about 13 seconds. With vitamin K deficiency, the prothrombin time can be several minutes. The test involves taking a sample of blood, placing it in a machine called a fibrometer, and measuring the time it takes for blood-clot formation. Blood-clotting problems can also be caused by a rare genetic disease called **hemophilia**. Hemophilia is not related to vitamin K deficiency. Once vitamin K deficiency is suspected, further tests must be used to distinguish it from possible hemophilia. Where a bleeding dis-

KEY TERMS

Fat-soluble vitamin—Fat-soluble vitamins can be dissolved in oil or in melted fat.

Hemorrhage—Bleeding that continues for an abnormally long period of time.

Prothrombin—Prothrombin is a blood-clotting protein. Injury to a blood vessel produces a signal which triggers the conversion of prothrombin to thrombin. Thrombin is a protein which plays a central role in provoking the assembly of other proteins to form the blood clot.

Recommended Dietary Allowance (RDA)—The Recommended Dietary Allowances (RDAs) are quantities of nutrients in the diet that are required to maintain good health in people. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences, and may be revised every few years. A separate RDA value exists for each nutrient. The RDA values refer to the amount of nutrient expected to maintain good health in people. The actual amounts of each nutrient required to maintain good health in specific individuals differ from person to person.

Water-soluble vitamins—Water-soluble vitamins can be dissolved in water or juice.

order can be corrected by vitamin K treatment, the diagnosis of vitamin K deficiency is proven to be correct.

Treatment

Vitamin K deficiency in newborn infants is treated and prevented with a single injection of phylloquinone (5 mg). Adults with vitamin K deficiency are treated with daily oral doses of 10 mg phylloquinone for one week.

Prognosis

The prognosis for correcting vitamin K deficiency, and associated blood-clotting problems, is excellent.

Prevention

Aside from newborns and young infants, vitamin K deficiency is not a concern for the general population. Vitamin K deficiency can be prevented by assuring that the diet contains foods such as spinach, cabbage, brussels sprouts, and eggs. Soybean oil, canola oil, and olive oil are good sources of the vitamin, while corn oil and peanut oil are very poor sources.

Resources

BOOKS

Brody, T. *Nutritional Biochemistry*. San Diego: Academic Press, Inc., 1998.

Combs, G. *The Vitamins*. San Diego: Academic Press, Inc., 1992. Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

Suttie, J. W. "The importance of menaquinones in human nutrition." *Annual Review of Nutrition* 15 (1995): 399-417.

Tom Brody, PhD

Vitamin poisoning see **Vitamin toxicity**

Vitamin tests

Definition

Vitamin tests measure the levels of certain **vitamins** in an individual's blood. They are generally used to aid in the diagnosis of vitamin deficiencies or in detecting toxic amounts of a vitamin in a patient's system.

Purpose

Vitamins are components of food that are needed for growth, reproduction, and maintaining good health. The vitamins include vitamin D, vitamin E, vitamin A, and vitamin K, which are the fat-soluble vitamins, and folate, vitamin B₁₂, biotin, vitamin B₆, niacin, thiamin, riboflavin, pantothenic acid, and ascorbic acid, which are the water-soluble vitamins. Vitamins are required in the diet in only tiny amounts, in contrast to the energy components of the diet, such as sugars, starches, and fats. However, not receiving sufficient quantities of a certain vitamin can be devastating, resulting in vitamin deficiency diseases such as **scurvy**, **pellagra**, or rickets. Conversely, consuming too much of a certain vitamin can be toxic to a person's system. Vitamin tests are used to assess the level of certain vitamins in an individual's blood so that doctors can more accurately diagnose vitamin deficiency diseases or vitamin overdoses and devise effective therapy. The vitamins that are most commonly measured by doctors are folate, vitamin B₁₂, vitamin K, vitamin D, and vitamin A.

Description

Most of the vitamin tests are conducted by acquiring a sample of blood, and then preparing plasma or serum

from the blood sample. Each vitamin occurs at extremely small concentrations when compared to levels of most other molecules in the blood. Blood contains a great number of chemicals and molecules, and many of these tend to interfere with the vitamin tests. For this reason, a procedure that separates the vitamin from contaminating substances is usually performed immediately prior to conducting the actual test. Most laboratories use high pressure liquid chromatography (HPLC), also called high performance liquid chromatography, as this purification step. In HPLC, the sample is pumped at high pressure through a tube lined with an absorbent material, to which the different molecules cling at different rates. Following separation or purification by HPLC, the vitamin is detected by a color reaction or fluorescence reaction. In these reactions, the amount of color or fluorescence that is formed is proportional to the amount of vitamin in the sample, allowing the analyst to calculate the amount of vitamin present in the original sample. In the case of some vitamins, the purified vitamin is reacted with a special chemical (reagent) prior to detection.

Levels of some vitamins may be measured indirectly by a biological test that mimics the actual function of the vitamin in the body. Riboflavin status is often measured by a test in which the rate by which a certain enzyme converts one molecule into another indicates how much Vitamin B₂ is present in a person's blood. Vitamin K is often measured by a test that times how long it takes for a spontaneous blood clot to form in a prepared sample. Vitamin E status is often measured by placing the red blood cells in a test tube, adding hydrogen peroxide, and assessing the resulting breakdown of the red blood cells. When a **vitamin E deficiency** exists, the red blood cells have a greater tendency to break.

Preparation

Most vitamin tests require no preparation; however, some may require that the patient fast for at least eight hours before giving a blood sample, or stop using some medications.

Normal results

The values that are considered to be normal for each vitamin can vary slightly. This variability can arise from different testing machines or from different types of chemistry that are used in conducting the vitamin assays. In interpreting data on plasma vitamin levels, it should also be noted that different normal ranges may exist for different age groups and genders. For example, the normal range for plasma vitamin B₆ for males is 7-52 nanograms per milliliter (ng/mL) for males and 2-26 ng/mL for females.

The normal ranges for levels of certain vitamins are as follows. Please note that, by convention, the units referring to the levels of each of the vitamins may differ from each other. The units picogram/milliliter (pg/mL), nanogram/milliliter (ng/mL), and micrograms per deciliter (micrograms/dL) refer to the weight of vitamin in the specified volume. The units nanomoles/liter (nmol/L) and micromoles/liter (M/L) refer to the concentration of vitamin in the specified volume.

- folate (**folic acid**). 3.1-18.0 ng/mL
- vitamin B₁₂. 200-1100 pg/mL
- thiamin. 9-44 nmol/L
- riboflavin. 6.2-39 nmol/L
- vitamin B₆. 7-52 ng/mL
- vitamin C (ascorbic acid). 28-84 M/L
- vitamin A. 28-94 micrograms/dL
- vitamin D. (25-hydroxy-vitamin D). 25-50 ng/mL
- vitamin K. 80-1160 pg/mL

Abnormal results

In all cases, abnormal results fall below or above the normal concentration range. However, as noted above, values that are considered to be borderline or severely abnormal can differ according to the discretion of the medical laboratory or physician.

Resources

BOOKS

- Brody, Tom. *Nutritional Biochemistry*. San Diego: Academic Press, 1998.
 Combs, Gerald. *The Vitamins*. San Diego: Academic Press, 1992.
 Nollet, L. *Handbook of Food Analysis*. New York: Marcel Dekker, Inc., 1996.

Tom Brody, PhD

Vitamin toxicity

Definition

Vitamin toxicity is a condition in which a person develops symptoms as side effects from taking massive doses of **vitamins**. Vitamins vary in the amounts that are required to cause toxicity and in the specific symptoms that result. Vitamin toxicity, which is also called hypervitaminosis or vitamin **poisoning**, is becoming more common in developed countries because of the popularity of

vitamin supplements. Many people treat themselves for minor illnesses with large doses (megadoses) of vitamins.

Description

Overview

Vitamins are organic molecules in food that are needed in small amounts for growth, reproduction, and the maintenance of good health. Some vitamins can be dissolved in oil or melted fat. These fat-soluble vitamins include vitamin D, vitamin E, vitamin A (retinol), and vitamin K. Other vitamins can be dissolved in water. These water-soluble vitamins include folate (**folic acid**), vitamin B₁₂, biotin, vitamin B₆, niacin, thiamin, riboflavin, pantothenic acid, and vitamin C (ascorbic acid). Taking too much of any vitamin can produce a toxic effect. Vitamin A and vitamin D are the most likely to produce hypervitaminosis in large doses, while riboflavin, pantothenic acid, biotin, and vitamin C appear to be the least likely to cause problems.

Vitamins in medical treatment

Vitamin supplements are used for the treatment of various diseases or for reducing the risk of certain diseases. For example, moderate supplements of folic acid appear to reduce the risk for certain **birth defects** (neural tube defects), and possibly reduce the risk of **cancer**. Therapy for diseases brings with it the risk for irreversible vitamin toxicity only in the case of vitamin D. This vitamin is toxic at levels which are only moderately greater than the recommended dietary allowance (RDA). Niacin is commonly used as a drug for the treatment of heart disease. Niacin is far less toxic than vitamin D. Vitamin toxicity is not a risk with medically supervised therapy using any of the other vitamins.

Vitamin megadoses

With the exception of folic acid supplements, the practice of taking vitamin supplements by healthy individuals has little or no relation to good health. Most adults in the United States can obtain enough vitamins by eating a well-balanced diet. It has, however, become increasingly common for people to take vitamins at levels far greater than the RDA. These high levels are sometimes called vitamin megadoses. Megadoses are harmless for most vitamins. But in the cases of a few of the vitamins—specifically vitamin D, vitamin A, and vitamin B₆—megadoses can be harmful or fatal. Researchers have also started to look more closely at megadoses of vitamin C and of vitamin E, since indirect evidence suggests that these two vitamins may reduce the risks of cancer, heart disease, and **aging**. It is not yet clear whether megadoses of either of these vitamins has any influence on health. Some experts think that megadoses of vitamin

C may protect people from cancer. On the other hand, other researchers have gathered indirect evidence that vitamin C megadoses may cause cancer.

Causes and symptoms

Fat-soluble vitamins

VITAMIN D. Vitamin D and vitamin A are the most toxic of the fat-soluble vitamins. The symptoms of vitamin D toxicity are nausea, vomiting, **pain** in the joints, and loss of appetite. The patient may experience **constipation** alternating with **diarrhea**, or have tingling sensations in the mouth. The toxic dose of vitamin D depends on its frequency. In infants, a single dose of 15 mg or greater may be toxic, but it is also the case that daily doses of 1.0 mg over a prolonged period may be toxic. In adults, a daily dose of 1.0–2.0 mg of vitamin D is toxic when consumed for a prolonged period. A single dose of about 50 mg or greater is toxic for adults. The immediate effect of an overdose of vitamin D is abdominal cramps, **nausea and vomiting**. Toxic doses of vitamin D taken over a prolonged period of time result in irreversible deposits of calcium crystals in the soft tissues of the body that may damage the heart, lungs, and kidneys.

VITAMIN A. Vitamin A toxicity can occur with long-term consumption of 20 mg of retinol or more per day. The symptoms of vitamin A overdosing include accumulation of water in the brain (**hydrocephalus**), vomiting, tiredness, constipation, bone pain, and severe headaches. The skin may acquire a rough and dry appearance, with hair loss and brittle nails. Vitamin A toxicity is a special issue during **pregnancy**. Expectant mothers who take 10 mg vitamin A or more on a daily basis may have an infant with birth defects. These birth defects include abnormalities of the face, nervous system, heart, and thymus gland. It is possible to take in toxic levels of vitamin A by eating large quantities of certain foods. For example, about 30 grams of beef liver, 500 grams of eggs, or 2,500 grams of mackerel would supply 10 mg of retinol. The livers of polar bears and other arctic animals may contain especially high levels of vitamin A.

VITAMIN E. Megadoses of vitamin E may produce headaches, tiredness, double vision, and diarrhea in humans. Studies with animals fed large doses of vitamin E have revealed that this vitamin may interfere with the absorption of other fat-soluble vitamins. The term absorption means the transfer of the vitamin from the gut into the bloodstream. Thus, large doses of vitamin E consumed over many weeks or months might result in deficiencies of vitamin D, vitamin A, and vitamin K.

VITAMIN K. Prolonged consumption of megadoses of vitamin K (menadione) results in anemia, which is a

reduced level of red blood cells in the bloodstream. When large doses of menadione are given to infants, they result in the deposit of pigments in the brain, nerve damage, the destruction of red blood cells (hemolysis), and **death**. A daily injection of 10 mg of menadione into an infant for three days can kill the child. This tragic fact was discovered during the early days of vitamin research, when newborn infants were injected with menadione to prevent a disease known as hemorrhagic disease of the newborn. Today a different form of vitamin K is used to protect infants against this disease.

Water-soluble vitamins

FOLATE. Folate occurs in various forms in food. There are over a dozen related forms of folate. The folate in oral vitamin supplements occurs in only one form, however—folic acid. Large doses of folic acid (20 grams/day) can result in eventual kidney damage. Folate is considered, however, to be relatively nontoxic, except in cases where folate supplementation can lead to **pernicious anemia**.

VITAMIN B₁₂. Vitamin B₁₂ is important in the treatment of pernicious anemia. Pernicious anemia is more common among middle-aged and older adults; it is usually detected in patients between the ages of 40 and 80. The disease affects about 0.1% of all persons in the general population in the United States, and about 3% of the elderly population. Pernicious anemia is treated with large doses of vitamin B₁₂. Typically, 0.1 mg of the vitamin is injected each week until the symptoms of pernicious anemia disappear. The patient then takes oral doses of vitamin B₁₂ for the rest of his or her life. Although vitamin B₁₂ toxicity is not an issue for patients being treated for pernicious anemia, treatment of these patients with folic acid may cause problems. Specifically, pernicious anemia is often first detected because the patient feels weak or tired. If the anemia is not treated, the patient may suffer irreversible nerve damage. The problem with folic acid supplements is that the folic acid treatment prevents the anemia from developing, but allows the eventual nerve damage to occur.

VITAMIN B₆. Vitamin B₆ is clearly toxic at doses about 1000 times the RDA. Daily doses of 2–5 grams of one specific form of this vitamin can produce difficulty in walking and tingling sensations in the legs and soles of the feet. Continued megadoses of vitamin B₆ result in further unsteadiness, difficulty in handling small objects, and numbness in the hands. When the high doses are stopped, recovery begins after two months. Complete recovery may take two to three years.

VITAMIN C. The RDA for vitamin C in adults is 60 mg per day. Large doses of vitamin C are considered to be

toxic in persons with a family history of or tendency to form **kidney stones** or gallbladder stones. Kidney and gallbladder stones usually consist of calcium oxalate. Oxalate occurs in high concentrations in foods such as cocoa, chocolate, rhubarb, and spinach. A fraction of the vitamin C in the body is normally broken down in the body to produce oxalate. A daily supplement of 3.0 grams of vitamin C has been found to double the level of oxalate that passes through the kidneys and is excreted into the urine.

NIACIN. The RDA for niacin is 15–19 mg per day in adults. Niacin comes in two forms, nicotinic acid and nicotinamide. Either form can satisfy the adult requirement for this vitamin. Nicotinic acid, however, is toxic at levels of 100 times the RDA. It can cause flushing of the skin, nausea, diarrhea, and liver damage. Flushing is an increase in blood passing through the veins in the skin, due to the dilation of arteries passing through deeper parts of the face or other parts of the body. In spite of the side effects, however, large doses of nicotinic acid are often used to lower blood cholesterol in order to prevent heart disease. Nicotinic acid results in a lowering of LDL-cholesterol (“bad cholesterol”), an increase in HDL-cholesterol (“good cholesterol”), and a decrease in plasma triglycerides. Treatment involves daily doses of 1.5–4.0 grams of nicotinic acid per day. Flushing of the skin occurs as a side effect when nicotinic acid therapy is started, but may disappear with continued therapy.

Diagnosis

The diagnosis of vitamin toxicity is usually made on the basis of the patient’s dietary or medical history. Questioning the patient about the use of vitamin supplements may shed light on some of his or her physical symptoms. With some vitamins, the doctor can confirm the diagnosis by ordering blood or urine tests for specific vitamins. When large amounts of the water-soluble vitamins are consumed, a large fraction of the vitamin is absorbed into the bloodstream and promptly excreted into the urine. The fat-soluble vitamins are more likely to be absorbed into the bloodstream and deposited in the fat and other tissues. In the cases of both water-soluble and fat-soluble vitamins, any vitamin not absorbed by the intestines is excreted in the feces. Megadoses of many of the vitamins produce diarrhea, because the non-absorbed nutrient draws water out of the body and into the gut, resulting in the loss of this water from the body.

Treatment

In all cases, treatment of vitamin toxicity requires discontinuing vitamin supplements. Vitamin D toxicity needs additional action to reduce the calcium levels in the bloodstream because it can cause abnormally high levels of

KEY TERMS

Absorption—The transfer of a vitamin from the digestive tract to the bloodstream.

Ascorbic acid—Another name for vitamin C.

Hypercalcemia—Hypercalcemia is a condition marked by abnormally high levels of calcium in the blood. It is an issue during vitamin D toxicity.

Hypervitaminosis—Another name for vitamin toxicity.

Megadose—A very large dose of a vitamin, taken by some people as a form of self-medication.

Menadione—A synthetic form of vitamin K. It is sometimes called vitamin K₃.

Recommended Dietary Allowance (RDA)—The recommended dietary allowances (RDAs) are the quantities of nutrients in the diet that are needed for good health. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences and may be revised every few years.

Retinol—Another name for vitamin A.

plasma calcium (**hypercalcemia**). Severe hypercalcemia is a medical emergency and may be treated by infusing a solution of 0.9% sodium chloride into the patient's bloodstream. The infusion consists of two to three liters of salt water given over a period of one to two days.

Prognosis

The prognosis for reversing vitamin toxicity is excellent for most patients. Side effects usually go away as soon as overdoses are stopped. The exceptions are severe vitamin D toxicity, severe vitamin A toxicity, and severe vitamin B₆ toxicity. Too much vitamin D leads to deposits of calcium salts in the soft tissue of the body, which cannot be reversed. Birth defects due to vitamin A toxicity cannot be reversed. Damage to the nervous system caused by megadoses of vitamin B₆ can be reversed, but complete reversal may require a recovery period of over a year.

Prevention

Vitamin toxicity can be prevented by minimizing the use of vitamin supplements. If vitamin D supplements are being used on a doctor's orders, vitamin toxicity can be prevented by monitoring the levels of plasma calcium. The development of hypercalcemia with vitamin D treatment indicates that the patient is at risk for vitamin D toxicity.

Resources

BOOKS

Brody, Tom. *Nutritional Biochemistry*. San Diego: Academic Press, 1998.

Combs, Gerald. *The Vitamins*. San Diego: Academic Press, Inc., 1992.

Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

PERIODICALS

Markstad, T., et al. "Intermittent Digh-dose Vitamin D Prophylaxis During Infancy: Effect on Vitamin D Metabolites, Calcium, and Phosphorus." *American Journal of Clinical Nutrition* 46 (1987): 652-658.

Tzimas, G., et al. "Embryotoxic Doses of Vitamin A to Rabbits Result in Low Plasma but High Embryonic Concentrations of All-trans-retinoic Acid: Risk of Vitamin A Exposure in Humans." *Journal of Nutrition* 126 (1996): 2159-2171.

Tom Brody, PhD

Vitamins

Definition

Vitamins are organic components in food that are needed in very small amounts for growth and for maintaining good health. The vitamins include vitamin D, vitamin E, vitamin A, and vitamin K, or the fat-soluble vitamins, and folate (**folic acid**), vitamin B₁₂, biotin, vitamin B₆, niacin, thiamin, riboflavin, pantothenic acid, and vitamin C (ascorbic acid), or the water-soluble vitamins. Vitamins are required in the diet in only tiny amounts, in contrast to the energy components of the diet. The energy components of the diet are sugars, starches, fats, and oils, and these occur in relatively large amounts in the diet.

Most of the vitamins are closely associated with a corresponding vitamin deficiency disease. **Vitamin D deficiency** causes rickets, a disease of the bones. **Vitamin E deficiency** occurs only very rarely, and causes nerve damage. **Vitamin A deficiency** is common throughout the poorer parts of the world, and causes night blindness. Severe vitamin A deficiency can result in xerophthalmia, a disease which, if left untreated, results in total blindness. **Vitamin K deficiency** results in spontaneous bleeding. Mild or moderate folate deficiency is common throughout the world, and can result from the failure to eat green, leafy vegetables or fruits and fruit juices. Folate deficiency causes megaloblastic anemia, which is characterized by the presence of large abnormal cells called megaloblasts in the circulating blood. The symptoms of megaloblastic anemia are tiredness and weakness. Vitamin B₁₂ deficiency occurs with

Essential Vitamins

Vitamin	What It Does For The Body
Vitamin A (Beta Carotene)	Promotes growth and repair of body tissues; reduces susceptibility to infections; aids in bone and teeth formation; maintains smooth skin
Vitamin B-1 (Thiamin)	Promotes growth and muscle tone; aids in the proper functioning of the muscles, heart, and nervous system; assists in digestion of carbohydrates
Vitamin B-2 (Riboflavin)	Maintains good vision and healthy skin, hair, and nails; assists in formation of antibodies and red blood cells; aids in carbohydrate, fat, and protein metabolism
Vitamin B-3 (Niacinamide)	Reduces cholesterol levels in the blood; maintains healthy skin, tongue, and digestive system; improves blood circulation; increases energy
Vitamin B-5	Fortifies white blood cells; helps the body's resistance to stress; builds cells
Vitamin B-6 (Pyridoxine)	Aids in the synthesis and breakdown of amino acids and the metabolism of fats and carbohydrates; supports the central nervous system; maintains healthy skin
Vitamin B-12 (Cobalamin)	Promotes growth in children; prevents anemia by regenerating red blood cells; aids in the metabolism of carbohydrates, fats, and proteins; maintains healthy nervous system
Biotin	Aids in the metabolism of proteins and fats; promotes healthy skin
Choline	Helps the liver eliminate toxins
Folic Acid (Folate, Folicin)	Promotes the growth and reproduction of body cells; aids in the formation of red blood cells and bone marrow
Vitamin C (Ascorbic Acid)	One of the major antioxidants; essential for healthy teeth, gums, and bones; helps to heal wounds, fractures, and scar tissue; builds resistance to infections; assists in the prevention and treatment of the common cold; prevents scurvy
Vitamin D	Improves the absorption of calcium and phosphorous (essential in the formation of healthy bones and teeth) maintains nervous system
Vitamin E	A major antioxidant; supplies oxygen to blood; provides nourishment to cells; prevents blood clots; slows cellular aging
Vitamin K (Menadione)	Prevents internal bleeding; reduces heavy menstrual flow

the failure to consume meat, milk or other dairy products. Vitamin B₁₂ deficiency causes megaloblastic anemia and, if severe enough, can result in irreversible nerve damage. Niacin deficiency results in **pellagra**. Pellagra involves skin **rashes** and scabs, **diarrhea**, and mental depression. Thiamin deficiency results in **beriberi**, a disease resulting in atrophy, weakness of the legs, nerve damage, and **heart failure**. Vitamin C deficiency results in **scurvy**, a disease that involves bleeding. Specific diseases uniquely associated with deficiencies in vitamin B₆, riboflavin, or pantothenic acid have not been found in the humans, though persons who have been starving, or consuming poor **diets** for several months, might be expected to be deficient in most of the nutrients, including vitamin B₆, riboflavin, and pantothenic acid.

Some of the vitamins serve only one function in the body, while other vitamins serve a variety of unrelated functions. Hence, some vitamin deficiencies tend to result in one type of defect, while other deficiencies result in a variety of problems.

Purpose

People are treated with vitamins for three reasons. The primary reason is to relieve a vitamin deficiency, when one has been detected. Chemical tests suitable for the detection of all vitamin deficiencies are available. The diagnosis of vitamin deficiency is often aided by visual tests, such as the examination of blood cells with a microscope, the x ray examination of bones, or a visual examination of the eyes or skin.

A second reason for vitamin treatment is to prevent the development of an expected deficiency. Here, vitamins are administered even with no test for possible deficiency. One example is vitamin K treatment of newborn infants to prevent bleeding. Food supplementation is another form of vitamin treatment. The vitamin D added to foods serves the purpose of preventing the deficiency from occurring in persons who may not be exposed much to sunlight and who fail to consume foods that are fortified with vitamin D, such as milk. Niacin supplementation prevents pellagra, a disease that occurs in people who rely heavily on corn as the main source of food, and who do not eat much meat or milk. In general, the American food supply is fortified with niacin.

A third reason for vitamin treatment is to reduce the risk for diseases that may occur even when vitamin deficiency cannot be detected by chemical tests. One example is folate deficiency. The risk for cardiovascular disease can be slightly reduced for a large fraction of the population by folic acid supplements. And the risk for certain **birth defects** can be sharply reduced in certain women by folic acid supplements.

Vitamin treatment is important during specific diseases where the body's normal processing of a vitamin is impaired. In these cases, high doses of the needed vitamin can force the body to process or utilize it in the normal manner. One example is **pernicious anemia**, a disease that tends to occur in middle age or old age, and impairs the absorption of vitamin B₁₂. Surveys have revealed that about 0.1% of the general population, and 2-3% of the elderly, may have the disease. If left untreated,

KEY TERMS

Genetic disease—A genetic disease is a disease that is passed from one generation to the next, but does not necessarily appear in each generation. An example of genetic disease is Down's syndrome.

Plasma—Blood consists of red and white cells, as well as other components, that float in a liquid. This liquid is called plasma.

Recommended dietary allowance (RDA)—The Recommended Dietary Allowances (RDAs) are quantities of nutrients of the diet that are required to maintain human health. RDAs are established by the Food and Nutrition Board of the National Academy of Sciences and may be revised every few years. A separate RDA value exists for each nutrient. The RDA values refer to the amount of nutrient expected to maintain health in the greatest number of people.

Serum—Serum is blood plasma with the blood clotting proteins removed. Serum is prepared by removing blood from the subject, allowing the blood naturally to form a blood clot, and then using a centrifuge to remove the red blood cells and the blood clot. The blood clot takes the form of an indistinct clump.

Vitamin status—Vitamin status refers to the state of vitamin sufficiency or deficiency of any person. For example, a test may reveal that a patient's folate status is sufficient, borderline, or severely inadequate.

ed, pernicious anemia leads to nervous system damage. The disease can easily be treated with large oral daily doses of vitamin B₁₂ (hydroxocobalamin) or with monthly injections of the vitamin.

Vitamin supplements are widely available as over-the-counter products. But whether they work to prevent or curtail certain illnesses, particularly in people with a balanced diet, is a matter of debate and ongoing research. For example, vitamin C is not proven to prevent the **common cold**. Yet, millions of people take it for that reason. Ask a physician or pharmacist for more information on the appropriate use of multivitamin supplements.

Precautions

Vitamin A and vitamin D can be toxic in high doses. Side effects range from **dizziness** to kidney failure. Ask a

physician or pharmacist about the correct use of a multi-vitamin supplement that contains these vitamins.

Description

Vitamin treatment is usually done in three ways: by replacing a poor diet with one that supplies the recommended dietary allowance, by consuming oral supplements, or by injections. Injections are useful for persons with diseases that prevent absorption of fat-soluble vitamins. Oral vitamin supplements are especially useful for persons who otherwise cannot or will not consume food that is a good vitamin source, such as meat, milk or other dairy products. For example, a vegetarian who will not consume meat may be encouraged to consume oral supplements of vitamin B₁₂.

Treatment of genetic diseases which impair the absorption or utilization of specific vitamins may require megadoses of the vitamin throughout one's lifetime. Megadose means a level of about 10-1,000 times greater than the RDA. Pernicious anemia, homocystinuria, and biotinidase deficiency are three examples of genetic diseases which are treated with megadoses of vitamins.

Preparation

The diagnosis of a vitamin deficiency usually involves a blood test. An overnight fast is usually recommended as preparation prior to withdrawal of the blood test so that vitamin-fortified foods do not affect the test results.

Aftercare

The response to vitamin treatment can be monitored by chemical tests, by an examination of red blood cells or white blood cells, or by physiological tests, depending on the exact vitamin deficiency.

Risks

Few risks are associated with vitamin treatment. Any possible risks depend on the vitamin and the reason why it was prescribed. Ask a physician or pharmacist about how and when to take vitamin supplements, particularly those that have not been prescribed by a physician.

Resources

BOOKS

- Brody, Tom. *Nutritional Biochemistry*. San Diego: Academic Press, 1998.
- Combs, Gerald. *The Vitamins*. San Diego: Academic Press, 1992.
- Food and Nutrition Board. *Recommended Dietary Allowances*. 10th ed. Washington, DC: National Academy Press, 1989.

Tom Brody, PhD

Vitiligo

Definition

Vitiligo is a condition in which a loss of cells that give color to the skin (melanocytes) results in smooth, white patches in the midst of normally pigmented skin.

Description

Vitiligo is a common, often inherited disorder characterized by areas of well-defined, milky white skin. People with vitiligo may have eye abnormalities and also have a higher incidence of thyroid disease, **diabetes mellitus**, and **pernicious anemia**. Vitiligo affects about 1-2% of the world's population. It is more easily observed in sun-exposed areas of the body and in darker skin types, but it affects any area of the body and all races. Vitiligo seems to affect men and women equally, although women more frequently seek treatment for the disorder.

Vitiligo may appear as one or two well-defined white patches or it may appear over large portions of the body. Typical sites for generalized vitiligo are areas surrounding body openings, bony areas, fingers, and toes. It can begin at any age but about 50% of the time it starts before the age of 20.

Causes and symptoms

Vitiligo is a disorder with complex causes. People with vitiligo seem to inherit a genetic predisposition for the disorder, and the appearance of disorder can be brought on by a variety of precipitating causes. Many people report that their vitiligo first appeared following a traumatic or stressful event, such as an accident, job loss, death of a family member, severe **sunburn**, or serious illness. There are at least three theories about the underlying mechanism of vitiligo. One theory says nerve endings in the skin release a chemical that is toxic to the melanocytes. A second theory states that the melanocytes simply self-destruct. The third explanation is that vitiligo is a type of autoimmune disease in which the immune system targets the body's own cells and tissues.

The primary symptom of vitiligo is the loss of skin color. Hair growing from the affected skin areas also lacks color. In addition, people with vitiligo may have pigment abnormalities of the retina or iris of the eyes. A minority of patients also may have inflammation of the retina or iris, but vision is not usually impaired.

Diagnosis

The diagnosis of vitiligo is usually made by observation. Progressive, white areas found at typical sites point



Loss of pigmentation is one characteristic of vitiligo, as seen on this woman's hand. (Custom Medical Stock Photo. Reproduced by permission.)

to a diagnosis of vitiligo. If the diagnosis is not certain, the doctor will test for other conditions which can mimic vitiligo, such as chemical leukoderma or **systemic lupus erythematosus**. If the tests rule out other conditions, vitiligo is confirmed.

Treatment

Vitiligo cannot be cured, but it can be managed. Cosmetics can be used to improve the appearance of the white areas not covered by clothing. **Sunscreens** prevent burning of the affected areas and also prevent the normal skin around the patches from becoming darker. Skin creams and oral medications are available for severe cases, but they have side effects that may make them undesirable. Autologous transplantation of skin is an option for those who are severely affected. Bleaching or depigmentation of the normal skin is another option.

In addition to treating the skin, attention should be paid to the psychological well-being of the individual. Extreme cases of vitiligo can be unattractive and may affect a person's outlook and social interactions.

Prognosis

The condition is usually gradually progressive. Sometimes the patches grow rapidly over a short period, and then the condition remains stable for many years.

Prevention

No measures are currently known to prevent vitiligo.

Resources

BOOKS

Fitzpatrick, Thomas B., et al., eds. *Dermatology in General Medicine*. New York: McGraw-Hill, 1993.

KEY TERMS

Autoimmune disease—A condition in which something triggers the immune system to react against and attack the body's own tissues.

Autologous transplantation—A procedure wherein the person donates blood or tissue to themselves.

Iris—The colored part of the eye.

Pernicious anemia—A disease in which red blood cells are abnormally formed due to the body's inability to absorb vitamin B₁₂.

Retina—The innermost layer of the eye, it contains the rods and cones, specialized light-sensitive cells.

Professional Guide to Diseases. 5th ed. Springhouse, PA: Springhouse Corporation, 1995.

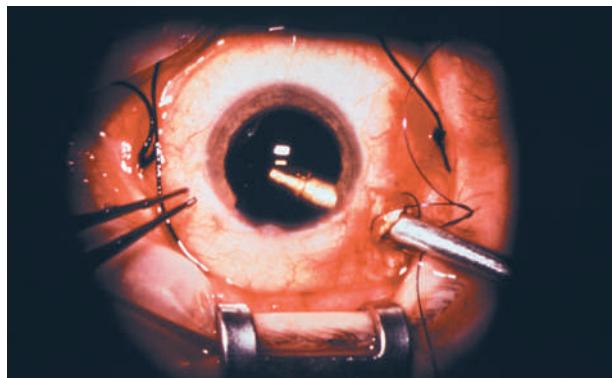
ORGANIZATIONS

Frontier's International Vitiligo Foundation. 4 Rozina Court, Owings Mills, MD 21117. (301) 594-0958.

National Foundation for Vitiligo and Pigment Disorders. 9032 South Normandy Drive, Centerville, OH 45459. (513) 885-5739.

National Vitiligo Foundation. P.O. Box 6337, Tyler, TX 75703. (903) 531-9767. 73071.33@compuserve.com.

Dorothy Elinor Stonely



Vitrectomy is a surgical procedure in which the vitreous, the transparent gel that fills the eye from the iris to the retina, is removed. During this procedure, the surgeon penetrates the eyeball with a tiny instrument (shown above), which liquefies the vitreous and suctions it out of the eye. (Photo Researchers, Inc. Reproduced by permission.)

the inside of the back of the eye. On occasion the retina will fall into the vitreous, a condition called **retinal detachment**. This may be due to disease in the vitreous that pulls the retina inward, small tears in the retina that allow liquid to seep behind it and push it forward, or injury to the eye that simply breaks the retina loose. It may be necessary to remove the vitreous in order to replace the retina and restore vision.

Description

Using instruments suited for microscopic surgery, the ophthalmologist (eye surgeon) penetrates the eyeball, aspirates the vitreous, and replaces it with saline. The saline replaces the vitreous at a constant pressure in order to keep the eye from collapsing. Once the saline is in place, both eyes are patched. The procedure takes two to three hours to complete.

Preparation

Because this is a major operation on the eye, the surgeon will perform a very extensive evaluation of both eyes. After looking inside with a variety of lenses, a CT, MRI, or ultrasound study may be needed. Immediately prior to the vitrectomy, the pupils will be dilated.

Aftercare

Eye drops and **antibiotics** are administered, and eye rest is advised until healing is completed.

Risks

Risks associated with vitrectomy are retinal detachment, bleeding, iatrogenic (medically caused) **cataracts**, and endophthalmitis (inflammation of the eyeball).

Vitrectomy

Definition

Vitrectomy is the surgical removal of the vitreous (transparent gel that fills the eye from the iris to the retina).

Purpose

The bulk of the contents of the eyeball is a clear jelly-like substance that is susceptible to several afflictions that impair vision by damaging its transparency.

- infections
- injuries
- bleeding, particularly from diabetic retinopathy.
- blood vessels growing into the vitreous, again due to diabetes

The retina is the light-sensitive membrane that receives images and transmits them to the brain. It covers

KEY TERMS

Computed tomography (CT scan)—Computerized method of creating images of internal organs using x rays.

Diabetic retinopathy—Disease that damages the blood vessels in the back of the eye caused by diabetes mellitus.

Endophthalmitis—Inflammation of the eyeball.

Iatrogenic—Inadvertently caused by medical treatment.

Magnetic resonance imaging (MRI)—Computerized method of creating images of internal organs using magnetic fields.

Saline—A salt solution equivalent to that in the body—0.9% salt in water.

KEY TERMS

Laryngitis—Inflammation of the larynx (voice box).

Lesion—A wound or injury.

Otorhinolaryngologist—A physician specializing in ear, nose, and throat diseases. Also known as otolaryngologist.

heavy use, the thickening may localize, producing a nodule. Unlike skin, heavy usage over a short time may also produce polyps. A polyp is a soft, smooth lump containing mostly blood and blood vessels. A nodule is similar to a polyp, but tends to be firmer.

Causes and symptoms

Chronic infections caused by **allergies** and inhalation of irritants, such as cigarette smoke, may produce these lesions, but extensive use of the voice is the most common cause of vocal nodules and polyps. Nodules and polyps are more common in male children, female adolescents, and female adults. This may be due in part to the faster speed at which the cords vibrate to produce higher-pitched voices.

Voice alterations are most apparent in singers, who may notice the higher registers are the first to change. Hoarseness causes others to seek medical attention.

Diagnosis

The head and neck surgeon (otorhinolaryngologist) must see the vocal cords to diagnose these lesions. It is also important to confirm that there are not other problems instead of or in addition to these benign lumps. Other causes of hoarseness include throat cancers, **vocal cord paralysis**, and simple **laryngitis**. The cords can usually be seen using a mirror placed at the back of the tongue. More elaborate scopes, including a videostroboscope, allow better views while the cords are producing sounds.

A biopsy of a nodule or polyp will ensure they are not cancerous.

Treatment

Voice rest is the first choice treatment for polyps. Polyps that appeared suddenly will resolve with a few days of complete silence. Nodules do not disappear with rest. Lesions that have been there longer may be slower to disappear and require voice training by a speech therapist.

Nodules and polyps may be surgically removed, using either conventional techniques or lasers.

Normal results

Vision is restored to useful levels in two-thirds of patients.

Resources

BOOKS

- O'Malley, Conor. "Vitreous." In *General Ophthalmology*. 13th ed. Ed. Daniel Vaughan. Stamford: Appleton & Lange, 1993.
Sardegna, Jill, and T. Paul Otis. *The Encyclopedia of Blindness and Vision Impairment*. New York: Facts on File, Inc., 1990.

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Vivax malaria see **Malaria**

Vocal cord nodules and polyps

Definition

Vocal cord nodules and polyps are noncancerous growths on the vocal cords that affect the voice.

Description

The vocal cords, located in the voice box in the middle of the neck, are two tough, fibrous bands that vibrate to produce sound. They are covered with a layer of tissue that is similar to skin. With use, this layer thickens. With

Prognosis

Continued overuse of the voice will cause these lesions to regrow.

Prevention

Careful use of the voice will prevent most vocal cord nodules and polyps. Avoiding inhaled irritants, may also prevent nodules and polyps from forming.

Resources

BOOKS

Ballenger, John Jacob. *Disorders of the Nose, Throat, Ear, Head, and Neck*. Philadelphia: Lea & Febiger, 1991.

J. Ricker Polsdorfer, MD

Vocal cord paralysis

Definition

Vocal cord **paralysis** is the inability to move the vocal cords and the resulting loss of vocal cord function.

Description

The vocal cords are a pair of tough, fibrous bands that lie across the air column in the middle of the voice box. They assist three functions: breathing, swallowing, and speaking. When vocal cords vibrate, they produce sound, allowing us to speak. Vocal cords temporarily stop breathing to aid coughing and for expelling **foreign objects**. During swallowing, the vocal cords shut the airway so that food is not inhaled. When vocal cords are paralyzed, all three functions are affected.

The relaxed position of the vocal cords is halfway open. There is one set of muscles that closes them all the way and one set that opens them. Each set of muscles is controlled by a different nerve. Each nerve comes from a different direction—one from above and one from below (the recurrent laryngeal nerve). Vocal cords can either be partially paralyzed on one side or completely paralyzed on both sides.

Causes and symptoms

Vocal cord paralysis can result from injury, tumors, or surgery in the neck and upper chest. Brain tumors and **stroke** can also affect the nerves. Infectious diseases that damage nerves—like **whooping cough**, **tetanus** and polio—can also cause vocal cord paralysis. Vocal cord paralysis can also appear as a congenital defect. If congenital, the most frequent cause is a brain defect, which can often be effectively treated.

KEY TERMS

Computed tomography (CT scan)—Computerized use of x rays to create images of internal organs.

Laryngoscope—A diagnostic instrument that is used to examine the interior of the larynx.

Magnetic resonance imaging (MRI)—Computerized use of magnetic fields and radio-frequency signals to create images of internal organs.

Recurrent laryngeal nerve—One of two offshoots of the vagus nerve that connect to the larynx. It is located below the larynx.

Stridor—A raspy sound that occurs during respiration when the airways are blocked.

Tracheostomy—Surgical opening in the neck to the trachea to aid respiration.

Voice box—The larynx.

The most dangerous form of vocal cord paralysis is one that affects the opening function, controlled by the recurrent laryngeal nerve. If both vocal cords are paralyzed, breathing stops or becomes very labored. Fortunately, injury during trauma or surgery often involves only one side, but the congenital causes can damage both sides.

Vocal cord paralysis produces several symptoms.

- The voice is always affected; at best it is breathy and weak. At worst, it is not there at all. In infants, the cry can be weak. Older children will suppress laughing and coughing because it is hard to do.
- Swallowing may be hindered so that food ends up in the airway, causing violent coughing and often leading to pneumonia.
- Breathing is obstructed on inspiration, producing a condition known as **stridor**. Closing the airway while breathing in produces creaking noises in the throat and changes the shape of the chest. The breast bone is drawn inward, much more visibly in the flexible chest of a small child.

Diagnosis

The voice box must be observed during breathing to characterize the problem. A viewing instrument called a laryngoscope, either flexible or rigid, is passed through the nose or throat until the cords become visible. The motion of each cord can then be seen, and other problems in the area identified.

X rays, CT, or MRI scans of the skull may be done if a brain disorder is suspected.

Treatment

An adequate airway is immediately necessary, usually secured with an endotracheal tube in the windpipe. If a cure cannot be achieved, a permanent breathing hole (tracheostomy) is cut in the neck. Brain problems that are relieved within 24 hours usually allow the cords to regain their function. Care must be taken to assure that swallowing takes place normally.

Alternative treatment

Vocal cord paralysis can be addressed with constitutional **homeopathy**. This will work with the whole person, not just the symptoms, to help bring about healing. Botanical medicine and deep tissue massage to the area can also bring some resolution, although it may not be long term.

Resources

BOOKS

Ballenger, John Jacob. *Disorders of the Nose, Throat, Ear, Head, and Neck*. Philadelphia: Lea & Febiger, 1991.

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Vocal cord polyps see **Vocal cord nodules and polyps**

Voiding cystourethrography see **Retrograde urethrography**

Volvulus see **Intestinal obstructions**

Vomiting see **Nausea and vomiting; Cyclic vomiting syndrome; Hyperemesis gravidarum**

Von Gierke's disease see **Glycogen storage diseases**

Von Recklinghausen disease see **Neurofibromatosis**

Description

The Finnish physician Erik von Willebrand was the first to describe von Willebrand disease (VWD). In 1926 Dr. von Willebrand noticed that many male and female members of a large family from the Aland Islands had increased bruising (bleeding into the skin) and prolonged episodes of bleeding. The severity of the bleeding varied between family members and ranged from mild to severe and typically involved the mouth, nose, genital and urinary tracts, and occasionally the intestinal tract. Excessive bleeding during the menstrual period was also experience by some of the women in this family. What differentiated this bleeding disorder from classical **hemophilia** was that it appeared not to be associated with muscle and joint bleeding and affected women and men rather than just men. Dr. von Willebrand named this disorder *hereditary pseudohemophilia*.

Pseudohemophilia, or von Willebrand disease (VWD) as it is now called, is caused when the body does not produce enough of a protein called von Willebrand factor(vWF) or produces abnormal vWF. vWF is involved in the process of blood clotting (coagulation). Blood clotting is necessary to heal an injury to a blood vessel. When a blood vessel is injured, vWF enables blood cells called platelets to bind to the injured area and form a temporary plug to seal the hole and stop the bleeding. vWF is secreted by platelets and by the cells that line the inner wall of the blood vessels (endothelial cells). The platelets release other chemicals, called factors, in response to a blood vessel injury, which are involved in forming a strong permanent clot. vWF binds to and stabilizes factor VIII, one of the factors involved in forming the permanent clot.

A deficiency or abnormality in vWF can interfere with the formation of the temporary platelet plug and also affect the normal survival of factor VIII, which can indirectly interfere with the production of the permanent clot. Individuals with VWD, therefore, have difficulty in forming blood clots and as a result they may bleed for longer periods of time. In most cases the bleeding is due to an obvious injury, although it can sometimes occur spontaneously.

VWD is classified into three basic types: type 1, 2, and 3 based on the amount and type of vWF that is produced. Type 1 is the most common and mildest form and results when the body produces slightly decreased amounts of typically normal vWF. Type 2 can be classified into five subtypes (A,B,M,N) and results when the body produces an abnormal type of vWF. Type 3 is the rarest and most severe form and results when the body does not produce any detectable vWF.

Approximately one out of 100 people are affected with VWD, making it the most common inherited bleed-

von Willebrand disease

Definition

Von Willebrand disease is caused by a deficiency or an abnormality in a protein called von Willebrand factor and is characterized by prolonged bleeding.

ing disorder (hemophilia). VWD affects people of all ethnic backgrounds. Approximately 70–80% of people with VWD have type 1 and close to 20–30% have type 2. Type 3 is very rare and occurs in less than one percent of people with VWD.

Causes and symptoms

The genetics of VWD are complex and involve a gene that produces vWF and is found on chromosome 12. Since we inherit two of each type of chromosome we inherit two vWF genes. There are different types of changes in the vWF gene that can affect the production of vWF. Some types of changes can cause the vWF gene to produce decreased amounts of normal vWF, while other changes can cause the gene to produce abnormal vWF. Most of the gene changes are significant enough that a change in only one vWF gene is sufficient to cause VWD. Some gene changes only cause VWD if both genes are changed, which often leads to more severe symptoms. Type 1 VWD is called an autosomal dominant condition since it is caused by a change in only one vWF gene. Since type 1 VWD results in only a slight decrease in the amount of vWF produced, the symptoms are often mild and even non-existent in some patients. Most cases of Type 2 VWD are autosomal dominant since they are caused by a change in only one vWF gene that results in the production of an abnormal protein. An autosomal dominant form of VWD can be inherited from either parent or can occur spontaneously in the embryo that is formed when the egg and sperm cells come together during fertilization.

Some cases of type 2 VWD and all cases of type 3 VWD are autosomal recessive since they are caused by changes in both vWF genes. A person with an autosomal recessive form of VWD has inherited a changed gene from his or her mother and a changed gene from his or her father. Parents who have a child with an autosomal recessive form of VWD are called carriers, since they each possess one changed vWF gene and one unchanged vWF gene. Many carriers for the autosomal recessive forms of type 2 VWD and type 3 VWD do not have any symptoms, although some people with type 3 VWD are born to parents who have type 1 VWD and may have symptoms. Each child born to parents who are both carriers for VWD has a 25% chance of having VWD, a 50% chance of being a carrier, and a 25% chance of being neither a carrier nor affected with VWD disease. A person with an autosomal dominant form of VWD has a 50% chance of passing the changed gene on to his or her children who may or may not have symptoms.

VWD is usually a relatively mild disorder characterized by easy bruising, recurrent nosebleeds, heavy men-

strual periods, and extended bleeding after surgeries and invasive dental work. There is a great deal of variability in the severity of symptoms, which can range from clinically insignificant to life threatening. Even people within the same family who are affected with the same type of VWD may exhibit different symptoms. An individual with VWD may exhibit a range of symptoms over the course of his or her lifetime and may experience an improvement in symptoms with age. The severity of the disease is partially related to the amount and type of vWF that the body produces, but is also influenced by other genetic and non-genetic factors.

Type 1

Type 1, the mildest form of VWD, is usually associated with easy bruising, recurrent nosebleeds, heavy menstrual periods, and prolonged bleeding after surgeries and invasive work. Many people with type 1 VWD do not have any noticeable symptoms or only have prolonged bleeding after surgery or significant trauma. The amount of vWF produced by the body increases during **pregnancy**, so prolonged bleeding during delivery is uncommon in people with type 1 VWD.

Type 2

People with type 2 VWD usually have symptoms from early childhood and symptoms may even be present at birth. They usually experience prolonged bleeding from cuts, easy bruising, nose bleeds, skin hematomas, and prolonged bleeding from the gums following teeth extraction and minor trauma. More than 50% of women with type 2 VWD experience heavy periods that may require a blood **transfusion**. Gastrointestinal bleeding is rare but can be life-threatening. Some women with type 2 VWD exhibit prolonged bleeding during delivery.

Type 3

Type 3 VWD can be quite severe and is associated with bruising and bleeding from the mouth, nose, intestinal, genital and urinary tracts. Type 3 is also associated with spontaneous bleeding into the muscles and joints, which can result in joint deformities. Some women with type 3 VWD experience prolonged bleeding during delivery.

Diagnosis

Diagnostic testing

Many people with VWD have mild symptoms or symptoms that can be confused with other bleeding disorders making it difficult to diagnose VWD on the basis of clinical symptoms. VWD should be suspected in any person with a normal number of platelets in their blood

and bleeding from the mucous membranes such as the nose, gums and gastrointestinal tract. Testing for an individual with suspected VWD often includes the measurement of:

- how long it takes for the bleeding to stop after a tiny cut is made in the skin (the **bleeding time**)
- the amount of vWF (vWF antigen measurement)
- the activity of vWF (ristocetin co-factor activity)
- the amount of factor VIII (factor VIII antigen measurement)
- activity of factor VIII

People with type 1 VWD usually have an increased bleeding time but they may have an intermittently normal bleeding time. They also have a decreased amount of vWF, and decreased vWF activity and usually have slightly decreased factor VIII levels and activity. People with type 2 VWD have a prolonged bleeding time, decreased activity of vWF and may have decreased amounts of vWF and factor VIII, and may have decreased factor VIII activity. Type 3 individuals have undetectable amounts of vWF, negligible vWF activity, factor VIII levels of less than 5–10%, and significantly reduced factor VIII activity. The activity of vWF is reduced for all types of VWD, making it the most sensitive means of identifying all three types of VWD. Patients with borderline results should be tested two to three times over a three month period.

Once a patient is diagnosed with VWD, further testing such as vWF multimer analysis and ristocetin-induced platelet aggregation (RIPA) may need to be performed to determine the subtype. Multimer analysis evaluates the structure of the vWF, and RIPA measures how much ristocetin is required to cause the clumping of platelets in a blood sample. The vWF multimer analysis is able to differentiate people with a structurally normal vWF (type 1) from people with a structurally abnormal vWF (type 2) and is often able to identify the subtype of patients with type 2 VWD. People with type 1 VWD usually have normal to decreased RIPA concentrations. Depending on the subtype, patients with type 2 VWD either have increased or decreased RIPA. RIPA is usually absent and the multimer analysis shows undetectable vWF in people with type 3 VWD.

In some cases DNA testing can be a valuable adjunct to biochemical testing. The detection of gene alteration(s) can confirm a diagnosis and can determine the type and subtype of VWD. It can also help to facilitate prenatal testing and testing of other family members. Unfortunately, as of 2001, many people with VWD possess DNA changes that are not detectable through DNA testing. A person who has a mother, father, or sibling diagnosed

with VWD should undergo biochemical testing for VWD. If the relative with VWD possesses a detectable gene change, then DNA testing should also be considered.

Prenatal testing

If one parent has been diagnosed with an autosomal dominant form of VWD or both parents are carriers for an autosomal recessive form of VWD, then prenatal testing can be considered. If the parent with an autosomal dominant form of VWD possesses a detectable gene change or both parents who are carriers for an autosomal recessive form of VWD possess detectable mutations, then DNA testing of their fetus would be available. DNA testing can be performed through **amniocentesis** or **chorionic villus sampling**. If the DNA change in the parent(s) is unknown then prenatal testing can sometimes be performed through biochemical testing of blood obtained from the fetal umbilical cord, which is less accurate and is associated with a higher risk of pregnancy loss.

Treatment

VWD is most commonly treated by replacement of vWF through the administration of blood products that contain vWF or through treatment with desmopressin (DDAVP, 1-deamino-8-D-arginine vasopressin). DDAVP functions by increasing the amount of factor VIII and vWF in the bloodstream. Treatment with blood products or DDAVP may be started in response to uncontrollable bleeding or may be administered prior to procedures such as surgeries or dental work. The type of treatment chosen depends on the type of VWD and a patient's response to a preliminary treatment trial.

Treatment with desmopressin

DDAVP is the most common treatment for people with type 1 VWD. About 80% of people with type 1 VWD respond to DDAVP therapy. Treatment with DDAVP can also be used to treat some people with type 2 VWD. Patients with Type 2B VWD should not be treated with this medication since DDAVP can induce dangerous platelet clumping. Type 3 VWD should not be treated with DDAVP since this medication does not increase the level of vWF in type 3 patients. DDAVP should only be used in people who have been shown to be responsive through a pre-treatment trial transfusion with this medication.

DDAVP can be administered intravenously or through a nasal inhaler. DDAVP has relatively few side effects although some people may experience facial flushing, tingling sensations, and headaches after treatment with this medication. Often treatment with this

KEY TERMS

Amniocentesis—A procedure performed at 16–18 weeks of pregnancy in which a needle is inserted through a woman’s abdomen into her uterus to draw out a small sample of the amniotic fluid from around the baby. Either the fluid itself or cells from the fluid can be used for a variety of tests to obtain information about genetic disorders and other medical conditions in the fetus.

Autosomal dominant—A pattern of genetic inheritance where only one abnormal gene is needed to display the trait or disease.

Autosomal recessive—A pattern of genetic inheritance where two abnormal genes are needed to display the trait or disease.

Biochemical testing—Measuring the amount or activity of a particular enzyme or protein in a sample of blood or urine or other tissue from the body.

Carrier—A person who possesses a gene for an abnormal trait without showing signs of the disorder. The person may pass the abnormal gene on to offspring.

Chorionic villus sampling (CVS)—A procedure used for prenatal diagnosis at 10–12 weeks gestation. Under ultrasound guidance a needle is inserted either through the mother’s vagina or abdominal wall and a sample of cells is collected from around the early embryo. These cells are then tested for chromosome abnormalities or other genetic diseases.

Chromosome—A microscopic thread-like structure found within each cell of the body and consists of a complex of proteins and DNA. Humans have 46 chromosomes arranged into 23 pairs. Changes in either the total number of chromosomes or their shape and size (structure) may lead to physical or mental abnormalities.

Deoxyribonucleic acid (DNA)—The genetic material in cells that holds the inherited instructions for growth, development, and cellular functioning.

Desmopressin (DDAVP)—A drug used in the treatment of von Willebrand’s disease.

Diagnostic testing—Testing performed to determine if someone is affected with a particular disease.

DNA testing—Analysis of DNA (the genetic component of cells) in order to determine changes in genes that may indicate a specific disorder.

Endothelial cells—The cells lining the inner walls of the blood vessels.

Factor VIII—A protein involved in blood clotting that requires vWF for stability and long-term survival in the bloodstream.

Gene—A building block of inheritance, which contains the instructions for the production of a particular protein, and is made up of a molecular sequence found on a section of DNA. Each gene is found on a precise location on a chromosome.

Mutation—A permanent change in the genetic material that may alter a trait or characteristic of an individual, or manifest as disease, and can be transmitted to offspring.

Platelets—Small disc-shaped structures that circulate in the blood stream and participate in blood clotting.

Prenatal testing—Testing for a disease such as a genetic condition in an unborn baby.

Protein—Important building blocks of the body, composed of amino acids, involved in the formation of body structures and controlling the basic functions of the human body.

Skin hematoma—Blood from a broken blood vessel that has accumulated under the skin.

von Willebrand factor (vWF)—A protein found in the blood that is involved in the process of blood clotting.

medication is only required prior to invasive surgeries or dental procedures.

Treatment with blood products

Patients who are unable to tolerate or are unresponsive to drug-based treatments are treated with concentrat-

ed factor VIII obtained from blood products. Not all factor VIII concentrates can be used since some do not contain enough vWF. The concentrate is treated to kill most viruses, although caution should be used since not all types of viruses are destroyed. If the factor VIII concentrates are unable to manage a severe bleeding episode, then blood products called cryoprecipitates, which con-

tain concentrated amounts of vWF, or platelet concentrates should be considered. Caution should be used when treating with these blood products since they are not treated to kill viruses.

Other treatments and precautions

Medications called fibrinolytic inhibitors can be helpful in the control of intestinal, mouth, and nose bleeding. Estrogens such as are found in **oral contraceptives** increase the synthesis of vWF and can sometimes be used in the long-term treatment of women with mild to moderate VWD. Estrogens are also sometimes used prior to surgery in women with type 1 VWD. Some topical agents are available to treat nose and mouth bleeds. Patients with VWD should avoid taking **aspirin**, which can increase their susceptibility to bleeding and people with severe forms of VWD should avoid activities that increase their risk of injury such as contact sports.

Prognosis

The prognosis for VWD disease is generally fairly good and most individuals have a normal lifespan. The prognosis can depend, however on accurate diagnosis and appropriate medical treatment.

Resources

BOOKS

Handin, Robert I. "Disorders of the Platelet and Vessel Wall." In *Harrison's Principles of Internal Medicine*, edited by Anthony S. Fauci, et al. New York: McGraw-Hill, 1998.
Sadler, J.E. "Von Willebrand Disease." In *The Metabolic and Molecular Basis of Inherited Disease*, edited by C.R. Scriver, et al. New York: McGraw Hill, 1995.

PERIODICALS

Ginsburg, David. "Molecular Genetics of von Willebrand Disease." *Thrombosis and Haemostasis* 82, no. 2 (1999): 585-591.
Nichols, William C., and David Ginsburg. "Von Willebrand's Disease." *Medicine* 76 (Jan. 1997): 1.
Voelker, Rebecca. "New Focus on von Willebrand's Disease." *Journal of the American Medical Association* 278 (October 8, 1997): 1137.

ORGANIZATIONS

Canadian Hemophilia Society. 625 President Kennedy, Suite 1210, Montreal, QUE H3A 1K2. Canada (514) 848-0503. Fax: (514) 848-9661. chs@hemophilia.ca. <<http://www.hemophilia.ca/english/index.html>>.
Haemophelia Society—Von Willebrand Support Services. Chesterfield House, 385 Euston Road, London, NW1 3AU. UK 0171 380 0600. Fax: 0171 387 8220. melissa@haemophilia-soc.demon.co.uk. <<http://www.haemophilia-soc.demon.co.uk/vwd%20services1.html>>.

National Hemophilia Foundation. Soho Building, 110 Greene Street, Suite 406, New York, NY 10012. (212) 219-8180. <<http://www.hemophilia.org/home.htm>>.

OTHER

Mannucci, Pier "Desmopressin (DDAVP) in the Treatment of Bleeding Disorders: The First Twenty Years." The Treatment of Hemophilia Monograph Series. No. 11 (1998). <http://www.wfh.org/InformationAboutHemophilia/Publications/Monographs/Treatment_Series/TOH_PDF/TOH_11_DDAVP.pdf>. Paper, Renee. "Gynecological Complications in Women with Bleeding Disorders." The Treatment of Hemophilia Monograph Series. No. 5 (1996). <http://www.wfh.org/InformationAboutHemophilia/Publications/Monographs/Treatment_Series/TOH_PDF/TOH5_VWD.pdf>. World Federation of Hemophilia. "Protocols for the Treatment of Hemophilia and von Willebrand Disease." No. 14 (1998). <http://www.wfh.org/InformationAboutHemophilia/Publications/Monographs/Treatment_Series/TOH_PDF/TOH14_Protocols_Treatment.pdf>.

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VSD see **Ventricular septal defect**

Vulvar cancer

Definition

Vulvar **cancer** refers to an abnormal, cancerous growth in the external female genitalia.

Description

Vulvar cancer is a rare disease that occurs mainly in elderly women. The vulva refers to the external female genitalia, which includes the labia, the opening of the vagina, the clitoris, and the space between the vagina and anus (perineum). There are two pairs of labia (a Latin term meaning lips). The labia meet to protect the openings of the vagina and the tube that connects to the bladder (urethra). The outer, most prominent folds of skin are called labia majora, and the smaller, inner skin folds are called labia minora. Vulvar cancer can affect any part of the female genitalia, but usually affects the labia.

Approximately 70% of vulvar cancers involve the labia (usually the labia majora), 15% to 20% involve the clitoris, and 15% to 20% involve the perineum. For approximately 5% of the cases, the cancer is present at more than one location. For approximately 10% of the cases, so much of the vulva is affected by cancer that the original location cannot be determined. Vulvar cancer

can spread to nearby structures including the anus, vagina, and urethra.

Most vulvar cancers are squamous cell carcinomas. Squamous cells are the main cell type of the skin. Squamous cell carcinoma often begins at the edges of the labia majora or labia minora or the area around the vagina. This type of cancer is usually slow-growing and may begin with a precancerous condition referred to as vulvar intraepithelial neoplasia (VIN), or dysplasia. This means that precancerous cells are present in the surface layer of skin.

Other, less common types of vulvar cancer are melanoma, basal cell carcinoma, adenocarcinomas, Paget's disease of the vulva, and tumors of the connective tissue under the skin. Melanoma, a cancer that develops from the cells that produce the pigment that determines the skin's color, can occur anywhere on the skin, including the vulva. Melanoma is the second most common type of vulvar cancer, and accounts for 5% to 10% of the cases. Half of all vulvar melanomas involve the labia majora. Basal cell carcinoma, which is the most common type of cancer that occurs on parts of the skin exposed to the sun, very rarely occurs on the vulva. Adenocarcinomas develop from glands, including the glands at the opening of the vagina (Bartholin's glands) that produce a mucus-like lubricating fluid.

Vulvar cancer is most common in women over 50 years of age. The median age at diagnosis is 65 to 70 years old. Additional risk factors for vulvar cancer include having multiple sexual partners, **cervical cancer**, and the presence of chronic vaginal and vulvar inflammations. This type of cancer is often associated with **sexually transmitted diseases**.

Vulvar cancer is most common in women who are between the ages of 65 and 75 years. In the United States there are approximately 3,000 new cases of vulvar cancer diagnosed each year. Vulvar cancer accounts for only 1% of all cancers in women. Approximately 5% of all gynecologic cancers occur on the vulva. For unknown reasons, the incidence of vulvar cancer seems to be rising.

Causes and symptoms

Cancer is caused when the normal mechanisms that control cell growth become disturbed, causing the cells to continually grow without stopping. This is usually the result of damage to the DNA in the cell. Although the cause of vulvar cancer is unknown, studies have identified several risk factors for vulvar cancer. These include:

- Vulvar intraepithelial neoplasia (VIN). This abnormal growth of the surface cells of the vulva can sometimes progress to cancer.

- Infection with human papillomavirus (HPV). This virus is sexually transmitted and can cause **genital warts**. Although HPV DNA can be detected in most cases of vulvar intraepithelial neoplasia, it is detected in fewer than half of all cases of vulvar cancer. Therefore, the link between HPV infection and vulvar cancer is unclear. As of 2001, it is theorized that two classes of vulvar cancer exist: one that is associated with HPV infection and one that is not.
- Herpes simplex virus 2 (HSV2). This sexually transmitted virus is also associated with increased risk for vulvar cancer.
- Cigarette **smoking**. Smoking in combination with infection by HPV or HSV2 was found to be a particularly strong risk factor for vulvar cancer.
- Infection with human **immunodeficiency virus** (HIV). This virus, which causes **AIDS**, decreases the body's immune ability, leaving it vulnerable to a variety of diseases, including vulvar cancer.
- Chronic vulvar inflammation. Long term irritation and inflammation of the vulva and vagina, which may be caused by poor hygiene, can increase the risk of vulvar cancer.
- Abnormal Pap smears. Women who have had abnormal Pap smears are at an increased risk of developing vulvar cancer.
- Chronic immunosuppression. Women who have had long-term suppression of their immune system caused by disease (such as certain cancers) or medication (such as those taken after organ transplantation) have an increased risk of developing vulvar cancer.

The hallmark symptom of vulvar cancer is **itching** (pruritus), which is experienced by 90% of the women afflicted by this cancer. The cancerous lesion is readily visible. Unfortunately, because of embarrassment or denial, it is not uncommon for women to delay medical assessment of vulvar abnormalities. Any abnormalities should be reported to a gynecologist.

If squamous cell vulvar cancer is present, it may appear as a raised red, pink, or white bump (nodule). It is often accompanied by **pain**, bleeding, vaginal discharge, and painful urination. **Malignant melanoma** of the vulva usually appears as a pigmented, ulcerated growth. Other types of vulvar cancer may appear as a distinct mass of tissue, sore and scaly areas, or cauliflower-like growths that look like **warts**.

Diagnosis

A gynecological examination will be used to observe the suspected area. During this examination, the

physician may use a special magnifying instrument called a colposcope to view the area better. Additionally, the area may be treated with a dilute solution of acetic acid, which causes some abnormal areas to turn white, making them easier to see. During this examination, if any area is suspected of being abnormal, a tissue sample (biopsy) will be taken. The biopsy can be performed in the doctor's office with the use of local anesthetic. A wedge-shaped piece of tissue, which contains the suspect lesion with some surrounding normal skin and the underlying skin layers and connective tissue, will be removed. Small lesions will be removed in their entirety (excisional biopsy). The diagnosis of cancer depends on a microscopic analysis of this tissue by a pathologist.

The diagnosis for vulvar cancer will determine how advanced the cancer is and how much it has spread. This is determined by the size of the tumor and how deep it has invaded the surrounding tissue and organs, such as the lymph nodes. It will also be determined if the cancer has metastasized, or spread to other organs. Tests used to determine the extent of the cancer include x ray and computed tomography scan (CT scan). Endoscopic examination of the bladder (**cystoscopy**) and/or rectum (proctoscopy) may be performed if it is suspected that the cancer has spread to these organs.

Treatment

Clinical staging

The International Federation of Gynecology and Obstetrics (FIGO) has adopted a surgical staging system for vulvar cancer. The stage of cancer is determined after surgery. The previous clinical staging system for vulvar cancer is no longer used. Vulvar cancer is categorized into five stages (0, I, II, III, and IV) which may be further subdivided (A and B) based on the depth or spread of cancerous tissue. The FIGO stages for vulvar cancer are:

- Stage 0. Vulvar intraepithelial neoplasia.
- Stage I. Cancer is confined to the vulva and perineum. The lesion is less than 2 cm (about 0.8 in) in size.
- Stage II. Cancer is confined to the vulva and perineum. The lesion is larger than 2 cm (larger than 0.8 in) in size.
- Stage III. Cancer has spread to the vagina, urethra, anus, and/or the lymph nodes in the groin (inguinofemoral).
- Stage IV. Cancer has spread to the bladder, bowel, pelvic bone, pelvic lymph nodes, and/or other parts of the body.

Treatments

Treatment for vulvar cancer will depend on its stage and the patient's general state of health. Surgery is the mainstay of treatment for most cases of vulvar cancer.

SURGERY. The primary treatment for stage I and stage II vulvar cancer is surgery to remove the cancerous lesion and possibly the inguinofemoral lymph nodes. Removal of the lesion may be done by laser, to burn off a minimal amount of tissue, or by scalpel (local excision), to remove more of the tissue. The choice will depend on the severity of the cancer. If a large area of the vulva is removed, it is called a vulvectomy. Radical vulvectomy removes the entire vulva. A vulvectomy may require skin grafts from other areas of the body to cover the wound and make an artificial vulva. Because of the significant morbidity and the psychosexual consequences of radical vulvectomy, there is a trend toward minimizing the extent of cancer excision. The specific inguinofemoral lymph node that would receive lymph fluid from the cancerous lesion, known as the sentinel node, may be exposed for examination (lymph node dissection) or removed (lymphadenectomy), especially in cases in which the cancerous lesion has invaded to a depth of more than 1 mm. Surgery may also be followed by **chemotherapy** and/or **radiation therapy** to kill additional cancer cells.

Surgical treatment of stage III and stage IV vulvar cancer is much more complex. Extensive surgery would be necessary to completely remove the cancerous tissue. Surgery would involve excision of pelvic organs (pelvic exenteration), radical vulvectomy, and lymphadenectomy. Because this extensive surgery comes with a substantial risk of complications, it may be possible to treat advanced vulvar cancer with minimal surgery by using radiation therapy and/or chemotherapy as additional treatment (adjuvant therapy).

An intraoperative technique that is used to identify the sentinel node in **breast cancer** and melanoma is being applied to vulvar cancer. This technique, called lymphoscintigraphy, is performed during surgical treatment of vulvar cancer and allows the surgeon to immediately identify the sentinel node. A radioactive compound (technetium 99m sulfur colloid) is injected into the cancerous lesion approximately two hours prior to surgery. This injection causes little discomfort, so local anesthesia is not required. During surgery, a radioactivity detector is used to locate the sentinel node and any other nodes to which cancer has spread. Though still in the experimental stage, vulvar lymphoscintigraphy shows promise in reducing morbidity and hospital length of stay.

The most common complication of vulvectomy is the development of a tumor-like collection of clear liquid (wound seroma). Other surgical complications include urinary tract infection, wound infection, temporary nerve injury, fluid accumulation (**edema**) in the legs, **urinary incontinence**, falling or sinking of the genitals (genital prolapse), and blood clots (thrombus).

KEY TERMS

Adjuvant therapy—A treatment that is intended to aid primary treatment. Adjuvant treatments for vulvar cancer are radiation therapy and chemotherapy.

Biopsy—Removal of a small piece of tissue for microscopic examination. This is done under local anesthesia and removed by either using a scalpel or a punch, which removes a small cylindrical portion of tissue.

Colposcope—An instrument used for examination of the vagina and cervix. Part of the instrument includes a magnifying lens for better visualization.

Metastasis—The movement of cancer cells from one area of the body to another. This occurs through the blood vessels or the lymph vessels.

Pelvic exenteration—Surgical removal of the organs of the true pelvis which includes the uterus, vagina, and cervix.

Sentinel lymph node—The first lymph node to receive lymph fluid from a tumor. If the sentinel node is cancer-free, then it is likely that the cancerous cells have not metastasized.

RADIATION THERAPY. Radiation therapy uses high-energy radiation from x rays and gamma rays to kill the cancer cells. The skin in the treated area may become red and dry and may take as long as a year to return to normal. **Fatigue**, upset stomach, **diarrhea**, and nausea are also common complaints of women having radiation therapy. Radiation therapy in the pelvic area may cause the vagina to become narrow as scar tissue forms. This phenomenon, known as vaginal stenosis, makes intercourse painful.

CHEMOTHERAPY. Chemotherapy uses **anticancer drugs** to kill the cancer cells. The drugs are given by mouth (orally) or intravenously. They enter the bloodstream and can travel to all parts of the body to kill cancer cells. Generally, a combination of drugs is given because it is more effective than a single drug in treating cancer. The side effects of chemotherapy are significant and include stomach upset, vomiting, appetite loss, hair loss, mouth or vaginal sores, fatigue, menstrual cycle changes, and **premature menopause**. There is also an increased chance of infections.

Alternative treatment

Although alternative and complementary therapies are used by many cancer patients, very few controlled

studies on the effectiveness of such therapies exist. Mind-body techniques such as prayer, **biofeedback**, visualization, **meditation**, and **yoga** have not shown any effect in reducing cancer but can reduce **stress** and lessen some of the side effects of cancer treatments. Clinical studies of hydrazine sulfate found that it had no effect on cancer and even worsened the health and well-being of the study subjects. One clinical study of the drug amygdalin (Laetrile) found that it had no effect on cancer. Laetrile can be toxic and has caused **death**. Shark cartilage, although highly touted as an effective cancer treatment, is an improbable therapy that has not been the subject of clinical study.

The American Cancer Society has found that the “metabolic diets” pose serious risk to the patient. The effectiveness of the macrobiotic, Gerson, and Kelley **diets** and the Manner metabolic therapy has not been scientifically proven. The FDA was unable to substantiate the anticancer claims made about the popular Cancell treatment.

There is no evidence for the effectiveness of most over-the-counter herbal cancer remedies. However, some herbs have shown an anticancer effect. As shown in clinical studies, Polysaccharide krestin, from the mushroom *Coriolus versicolor*, has significant effectiveness against cancer. In a small study, the green alga *Chlorella pyrenoidosa* has been shown to have anticancer activity. In a few small studies, evening primrose oil has shown some benefit in the treatment of cancer.

Prognosis

Factors that are correlated with disease outcome include the diameter and depth of the cancerous lesion, involvement of local lymph nodes, cell type, HPV status, and age of the patient. Vulvar cancers that are HPV positive have a better prognosis than those that are HPV negative. The 5-year survival rate is 98% for stage I vulvar cancer and 87% for stage II vulvar cancer. The survival rate drops steadily as the number of affected lymph nodes increases. The survival rate is 75% for patients with one or two, 36% for those with three or four, and 24% for those with five or six involved lymph nodes. The previous statistics were obtained from studies of patients who received surgical treatment only and cannot be used to determine survival rates when adjuvant therapy is employed.

Vulvar cancer can spread locally to encompass the anus, vagina, and urethra. Because of the anatomy of the vulva, it is not uncommon for the cancer to spread to the local lymph nodes. Advanced stages of vulvar cancer can affect the pelvic bone. The lungs are the most common site for vulvar cancer metastasis. Metastasis through the blood (hematogenous spread) is uncommon.

Prevention

The risk of vulvar cancer can be decreased by avoiding risk factors, most of which involve lifestyle choices. Specifically, to reduce the risk of vulvar cancer, women should not smoke and should refrain from engaging in unsafe sexual behavior. Good hygiene of the genital area to prevent infection and inflammation may also reduce the risk of vulvar cancer.

Because vulvar cancer is highly curable in its early stages, women should consult a physician as soon as a vulvar abnormality is detected. Regular gynecological examinations are necessary to detect precancerous conditions that can be treated before the cancer becomes invasive. Because some vulvar cancer is a type of skin cancer, the American Cancer Society also recommends self-examination of the vulva using a mirror. If **moles** are present in the genital area, women should employ the ABCD rule:

- Asymmetry. A cancerous mole may have two halves of unequal size.
- Border irregularity. A cancerous mole may have ragged or notched edges.
- Color. A cancerous mole may have variations in color.
- Diameter. A cancerous mole may have a diameter wider than 6 mm (1/4 in).

Resources

BOOKS

- American Cancer Society's Guide to Complementary and Alternative Cancer Methods.* Bruss, Katherine, Christina Salter, and Esmeralda Galan, eds. Atlanta: American Cancer Society, 2000.
- Eifel, Patricia, Jonathan Berrek, and James Thigpen. "Cancer of the Cervix, Vagina, and Vulva." In *Cancer: Principles & Practice of Oncology*. DeVita, Vincent, Samuel Hellman, and Steven Rosenberg, eds. Philadelphia: Lippincott Williams & Wilkins, 2001.
- Garcia, Agustin, and J. Tate Thigpen. "Tumors of the Vulva and Vagina." In *Textbook of Uncommon Cancer*. Raghavan, D., M. Brecher, D. Johnson, N. Meropol, P. Moots, and J. Thigpen, eds. Chichester: John Wiley & Sons, 1999.
- Primack, Aron. "Complementary/Alternative Therapies in the Prevention and Treatment of Cancer." In *Complementary/Alternative Medicine: An Evidence-Based Approach*. Spencer, John, and Joseph Jacobs. St. Louis: Mosby, 1999.

PERIODICALS

- Grendys, Edward, and James Fiorica. "Innovations in the Management of Vulvar Carcinoma." *Current Opinion in Obstetrics and Gynecology* 12 (February 2000): 15-20.

ORGANIZATIONS

- American Cancer Society. 1599 Clifton Rd. NE, Atlanta, GA 30329. (800) ACS-2345. <<http://www.cancer.org>>

Cancer Research Institute, National Headquarters. 681 Fifth Ave., New York, NY 10022. (800) 992-2623. <<http://www.cancerresearch.org>>.

Gynecologic Cancer Foundation. 401 N. Michigan Ave., Chicago, IL 60611. (800) 444-4441 or (312) 644-6610. <<http://www.wcn.org/gcf>>.

National Institutes of Health. National Cancer Institute. 9000 Rockville Pike, Bethesda, MD 20982. (800) 4-CANCER. <<http://cancernet.nci.nih.gov>>.

OTHER

Cancer Care News. 3 July 2001 <<http://www.cancercare.org>>.

Quackwatch, Questionable Cancer Therapies. 3 July 2001 <<http://www.quackwatch.com>>.

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Vulvitis see **Vulvovaginitis**

Vulvovaginitis

Definition

Inflammation of the vagina and vulva most often caused by a bacterial, fungal, or parasitic infection.

Description

Vulvovaginitis, vulvitis, and vaginitis are general terms that refer to the inflammation of the vagina and/or vulva (the external genital organs of a woman). These conditions can be caused by bacterial, fungal, or parasitic infections. Also, vulvovaginitis can be caused by low estrogen levels (called "atrophic vaginitis") or any type of allergic or irritation response from things such as spermicidal products, condoms, soaps, and bubble bath.

In general, vulvovaginitis causes vaginal discharge, irritation, and **itching**. One of the most common reasons why women visit their doctor is because of a change in vaginal discharge. It is completely normal for a woman to have a vaginal discharge, the amount and consistency of which varies during the course of the menstrual cycle. Each of the three most common types of vulvovaginitis will be described separately.

Bacterial vaginosis

Bacterial vaginosis is the most common cause of vaginitis during the childbearing years. Forty percent to 50% of vaginitis cases are caused by bacterial vaginosis. The occurrence of bacterial vaginosis is difficult to determine but studies have proposed that 10% to 41% of

women have had it at least once. The occurrence of bacterial vaginosis in the United States is highest among African-American women and women who have had multiple sexual partners and lowest among Asian women and women with no history of sexual contact with men. Bacterial vaginosis is not considered a sexually transmitted disease although it can be acquired by sexual intercourse.

Bacterial vaginosis is not caused by a particular organism but is a change in the balance of normal vaginal bacteria. Ninety percent of the bacteria found in a healthy vagina belong to the *Lactobacillus* family. For unknown reasons, there is a shift in the bacterial population that results in overgrowth of other bacteria. Patients suffering from bacterial vaginosis have very high numbers of bacteria such as *Gardnerella vaginalis*, *Mycoplasma hominis*, *Bacteroides* species, and *Mobiluncus* species. These bacteria can be found at numbers 100 to 1000 times greater than found in the healthy vagina. In contrast, *Lactobacillus* bacteria are in very low numbers or completely absent from the vagina of women with bacterial vaginosis.

Candida vulvovaginitis

Candida vulvovaginitis also has been called “vulvovaginal candidiasis,” “candidal vaginitis,” “monilial infection,” or “vaginal yeast infection.” Twenty to 25% of the vaginitis cases are candida vulvovaginitis. It has been estimated that about 75% of all women get a vaginal yeast infection at least once. In 80-90% of the cases, candida vulvovaginitis is caused by an overgrowth of the yeast *Candida albicans*. The remaining cases are caused by other species of *Candida*. It is not known what causes the yeast overgrowth. However, **antibiotics** can inadvertently kill normal bacteria in the vagina and cause an overgrowth of *Candida*.

Candida vulvovaginitis is not considered a sexually transmitted disease because *Candida* species are commonly found in the healthy vagina. It is a rare disease in girls before **puberty** and celibate women. Vaginal yeast infections tend to occur more frequently in women who are pregnant, diabetic and not controlling their disease, taking birth control pills, or taking antibiotics. Some women have four or more attacks per year which is called “recurrent vaginal candidiasis.”

Trichomoniasis

Trichomoniasis, which is sometimes called “trich,” accounts for 15-20% of the cases of vaginitis. It is estimated that two million to three million American women get trichomoniasis each year. Unlike the previous two causes of vulvovaginitis, trichomoniasis is a sexually transmitted disease. This means that the disease is passed

from person-to-person only by sexual contact. Trichomoniasis occurs in both men and women and is caused by an infection with the single-celled parasite *Trichomonas vaginalis*. Infection with *Trichomonas vaginalis* is frequently associated with other **sexually transmitted diseases** and assists the spread of the **AIDS** virus.

Causes and symptoms

Vulvovaginitis is most often caused by a bacterial, fungal, or parasitic infection as described above. Other microorganisms may cause vulvovaginitis, or it may be caused by allergic reaction, irritation, injury, low estrogen levels, and certain diseases. Risk factors for bacterial vaginosis include using an intrauterine device (**IUD**), non-white race, prior **pregnancy**, first sexual activity at an early age, having multiple sexual partners, and having a history of sexually transmitted diseases. Persons at an increased risk for candida vulvovaginitis include those who have had previous candida infections, frequent sexual intercourse, use birth control pills, have AIDS, are pregnant, are taking antibiotics or **corticosteroids**, are diabetic, use douches, use perfumed feminine hygiene sprays, wear tight clothing, or use vaginal sponges or an IUD.

The typical symptoms of vulvovaginitis are: vaginal discharge, itching, and irritation. Women may have few or no symptoms, while others may have pronounced symptoms. The main symptom of bacterial vaginosis is a fishy-smelling, thin, milky-white or gray vaginal discharge but itching and burning may also be present. The fishy smell is stronger after sexual intercourse. The symptoms of candida vulvovaginitis are itching, soreness, painful sexual intercourse, and a thick, curdy, white (like cottage cheese) vaginal discharge. Trichomoniasis symptoms are: painful urination, painful sexual intercourse, and a yellow-green to gray, foul smelling, sometimes frothy, vaginal discharge.

Diagnosis

Vulvovaginitis can be diagnosed and treated by a nurse practitioner or physician. Most insurance companies cover the costs of diagnosis and treatment. To diagnose vulvovaginitis, the doctor will examine the vagina (using a speculum to keep the vagina open) and take a sample of the vaginal discharge for tests and microscopic analysis. Laboratory culture results should be available in two to three days but the microscopic examination of the vaginal discharge may be immediately performed in the doctor’s office. Diagnosis may be difficult because there are many different causes of vulvovaginitis. Women who think that they have vulvovaginitis should always visit their doctor to get an accurate diagnosis. Many women assume that they have a yeast infection and

take over-the-counter medicines without first consulting their doctors.

There are four signs that indicate that a woman has bacterial vaginosis. These signs (called “Amsel’s criteria”) are: a thin, milky white discharge that clings to the walls of the vagina, presence of a fishy odor, a vaginal pH of greater than 4.5, and the presence of “clue cells” in the vagina. Clue cells are vaginal cells that are covered with small bacteria. A diagnosis of candida vulvovaginitis is made after finding a normal vaginal pH (4 to 4.5) and the presence of many yeast cells in the sample of vaginal discharge or growth of yeast on laboratory media. A trichomoniasis diagnosis is made when the parasites are found in the vaginal discharge either by microscopic examination or in laboratory cultures.

Treatment

Both bacterial vaginosis and trichomoniasis require prescription medication for treatment. Candida vulvovaginitis may be treated with either prescription or over-the-counter medicines. It is not advisable to take over-the-counter vaginal yeast infection medicines if one does not have a yeast infection. An Institute of Epidemiological Research survey of 390 gynecologists found that 44% of the women who were diagnosed with bacterial vaginosis had first treated themselves with over-the-counter yeast infection medications.

Bacterial vaginosis should be treated daily for one week with the antibiotics metronidazole (Flagyl, Proto-stat) or clindamycin (Cleocin) either as pills taken orally or in a gel or cream form put into the vagina. Trichomoniasis is treated with either a large, single dose of metronidazole or with a smaller dose taken twice daily for one week. Male sexual partners of women with trichomoniasis also must be treated.

Candida vulvovaginitis is most often treated by the application of medicated gels, creams, or suppositories applied directly to the vagina. The antifungal drugs used to treat candida vulvovaginitis include oral fluconazole (Diflucan), butoconazole (Femstat), clotrimazole (Gynelotrimin, Mycelex), miconazole (Monistat), and ticonazole (Vagistat). Most require only one or a few days of therapy to be effective. Women who have recurrent candida infections may receive treatment for several weeks and then some form of a long-term preventative treatment.

Alternative treatment

One of the primary focuses of alternative treatment for vaginal conditions including vulvovaginitis is rebalancing the normal vaginal flora. To assist with this rebalancing, *Lactobacillus acidophilus* and *L. bifidus* are recommended, either taken internally or introduced directly

KEY TERMS

Parasite—An animal or plant that can only survive by living inside or upon another animal or plant.

Vulva—The external genital organs of a woman, including the outer and inner lips, clitoris, and opening of the vagina.

into the vagina. Garlic (*Allium sativum*), both taken internally and inserted into the vagina (a peeled whole clove wrapped in gauze), may be helpful due to its antibacterial and antifungal actions. A variety of other herbs can be used as douches or in suppository form to help treat acute flare-ups of vaginal symptoms. For example a douche made by steeping 1–2 tsp. of calendula (*Calendula officinalis*) in boiling water (let the water cool before using) may help reduce inflammation. A boric acid douche can help to acidify the vaginal pH so that unwanted bacteria cannot survive and multiply. For atrophic vaginitis, especially in menopausal women, topical application of progesterone cream can help with the thinning of the tissue so that symptoms can abate.

Dietary modification and nutritional supplementation may also be helpful in the treatment of vulvovaginitis. Antioxidant **vitamins**, including A, C, and E, as well as B complex vitamins, and vitamin D, are recommended. Foods to avoid include cheese, alcohol, chocolate, soy sauce, sugar, vinegar, fruits, and any fermented foods. Wearing cotton underwear and loose fitting clothes and avoiding panty hose can help keep the vagina cool and dry, thus helping to prevent some forms of vulvovaginitis. Cases of chronic vulvovaginitis should be addressed on systemic level by an alternative practitioner.

Prognosis

Vulvovaginitis is a disease with minor symptoms and most women respond well to medications. It is believed that certain vaginal infections, if left untreated, can lead to more serious conditions such as **pelvic inflammatory disease**, endometritis, postsurgical infections, and spread of the AIDS virus.

Prevention

Vaginal infections may be prevented by following these suggestions:

- Over-the-counter yeast infection treatments should not be taken unless the woman had been diagnosed with **candidiasis** before and recognizes the symptoms.

- Douching should be avoided because it may disturb the balance of organisms in the vagina and may spread them higher into the reproductive system.
- Thoroughly dry oneself after bathing and remove a wet bathing suit promptly.
- Avoid wearing tight clothing and wear cotton underwear.
- Clean diaphragms, cervical caps, and spermicide applicators after use. Use condoms to avoid sexually transmitted disease.
- After a bowel movement, wipe from front to back to avoid spreading intestinal bacteria to the vagina.

Resources

PERIODICALS

Sobel, Jack D. "Vaginitis." *The New England Journal of Medicine* 337 (Dec. 1997): 1896-1903.

ORGANIZATIONS

National Vaginitis Association. 117 South Cook St., Suite 315, Barrington, IL 60010. (800) 909-8745. <VagAssoc@aol.com>. <<http://www.vaginalinfections.org>>.

OTHER

"Women's Health STD Information Center." *JAMA*. <<http://pubs.ama-assn.org>>.

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W

Waldenström disease see **Waldenström's macroglobulinemia**

Waldenström's macroglobulinemia

Definition

Waldenström's macroglobulinemia is a rare, chronic cancer of the immune system that is characterized by hyperviscosity, or thickening, of the blood.

Description

Waldenström's (Waldenstrom, Waldenstroem's) macroglobulinemia (WM) is a lymphoma, or cancer of the lymphatic system. It was first identified in 1944, by the Swedish physician Jan Gosta Waldenström, in patients who had a thickening of the serum, or liquid part, of the blood. Their blood serum contained a great deal of a very large molecule called a globulin. Thus, the disorder is called macroglobulinemia.

Lymphomas are cancers that originate in tissues of the lymphatic system. All lymphomas other than **Hodgkin's disease**, including WM, are known collectively as non-Hodgkin's lymphomas. There are 13 major types of non-Hodgkin's lymphomas, and others that are very rare. Other names that are sometimes used for WM include: lymphoplasmacytic lymphoma, lymphoplasmacytic leukemia, macroglobulinemia of Waldenström, primary macroglobulinemia, Waldenström's syndrome, Waldenström's purpura, or hyperglobulinemic purpura. Purpura refers to purple spots on the skin, resulting from the frequent bleeding and bruising that can be a symptom of WM.

WM is classified as a low-grade or indolent form of lymphoma because it is a slow-growing cancer that produces fewer symptoms than other types of lymphomas.

WM most often affects males over the age of 65. Frequently, this disease produces no symptoms and does not require treatment. It has not been studied as extensively as other types of lymphoma.

The lymphatic system

The lymphatic system is part of the body's immune system, for fighting disease, and part of the blood-producing system. It includes the lymph vessels and nodes, and the spleen, bone marrow, and thymus. The narrow lymphatic vessels carry lymphatic fluid from throughout the body. The lymph nodes are small, pea-shaped organs that filter the lymphatic fluid and trap foreign substances, including viruses, bacteria, and cancer cells. The spleen, in the upper left abdomen, removes old cells and debris from the blood. The bone marrow, the spongy tissue inside the bones, produces new blood cells.

B lymphocytes or B cells are white blood cells that recognize disease-causing organisms. They circulate throughout the body in the blood and lymphatic fluid. Each B lymphocyte recognizes a specific foreign substance, or antigen. When it encounters its specific antigen, the B cell begins to divide and multiply, producing large numbers of identical (monoclonal), mature plasma cells. These plasma cells produce large amounts of antibody that are specific for the antigen. Antibodies are large proteins called immunoglobulins (Igs) that bind to and remove the specific antigen.

A type of Ig, called IgM, is part of the early immune response. The IgM molecules form clusters in the bloodstream. When these IgM clusters encounter their specific antigen, usually a bacterium, they cover it so that it can be destroyed by other immune system cells.

Plasma cell neoplasm

WM is a type of plasma cell neoplasm or B-cell lymphoma. These are lymphomas in which certain plasma cells become abnormal, or cancerous, and begin to grow uncontrollably. In WM, the cancerous plasma cells

overproduce large amounts of identical (monoclonal) IgM antibody. This IgM also is called M protein, for monoclonal or myeloma protein.

Macroglobulinemia refers to the accumulation of this M protein in the serum of the blood. This large amount of M protein can cause the blood to thicken, causing hyperviscosity. The malignant plasma cells of some WM patients also produce and secrete partial immunoglobulins called light chains, or Bence-Jones proteins. The malignant plasma cells can invade various tissues, including the bone marrow, lymph nodes, and spleen, causing these tissues to swell.

WM accounts for about 1-2% of non-Hodgkin's lymphomas. It is estimated that it may affect about five out of every 100,000 people. It usually affects people over the age of 50, and most often develops after age 65. It is more common in men than in women. In the United States, WM is more common among Caucasians than among African Americans. The disease can run in families.

Causes and symptoms

The cause of WM is not known.

Many individuals with WM have no symptoms of the disease. This is known as asymptomatic macroglobulinemia. When symptoms of WM are present, they may vary greatly from one individual to the next.

Hyperviscosity syndrome

At least 50% of individuals with WM have hyperviscosity syndrome, an increased viscosity or thickening of the blood caused by the accumulation of IgM in the serum. Hyperviscosity can cause a slowing in the circulation through small blood vessels. This condition can lead to a variety of symptoms:

- fatigue
- weakness
- rash
- bruising
- nose bleeds
- gastrointestinal bleeding
- weight loss
- night sweats
- increased and recurrent infections
- poor blood circulation in the extremities

Poor blood circulation, or Raynaud's phenomenon, can affect any part of the body, but particularly the fingers, toes, nose, and ears.

Cold weather can cause additional circulatory problems, by further thickening the blood and slowing down circulation. In some cases, the excess blood protein may precipitate out of the blood in the cold, creating particles that can block small blood vessels. This is called cryoglobulinemia. The extremities may turn white, or a patchy red and white. The hands, feet, fingers, toes, ears, and nose may feel cold, numb, or painful.

Hyperviscosity may affect the brain and nervous system, leading to additional symptoms. These symptoms include:

- peripheral neuropathy, caused by changes in the nerves, leading to **pain** or numbness in the extremities
- dizziness
- headaches
- vision problems or loss of vision
- mental confusion
- poor coordination
- temporary paralysis
- mental changes

Hyperviscosity can clog the tubules that form the filtering system of the kidneys, leading to kidney damage or kidney failure. Existing heart conditions can be aggravated by WM. In extreme cases, WM may result in **heart failure**. Late-stage WM also may lead to mental changes that can progress to **coma**.

Anemia

The accumulation of IgM in the blood causes an increase in the volume of the blood plasma. This effectively dilutes out the red blood cells and other blood components. The lowered concentration of red blood cells can lead to anemia and cause serious fatigue. Likewise, a deficiency in platelets (**thrombocytopenia**), which cause the blood to clot, can result in easy bleeding and bruising. As the cancer progresses, there may be abnormal bleeding from the gums, nose, mouth, and intestinal tract. There may be bluish discoloration of the skin. In the later stages of the disease, leukopenia, a deficiency in white blood cells, also can develop.

Organ involvement

In 5-10% of WM cases, the IgM may be deposited in tissues. Thus, some individuals with WM have enlargement of the lymph nodes, the spleen, and/or the liver.

If Bence-Jones proteins are produced by the malignant plasma cells, they may be deposited in the kidneys. There they can plug up the tiny tubules that form the filtering system of the kidneys. This can lead to kidney damage and kidney failure.

KEY TERMS

Anemia—Any condition in which the red blood cell count is below normal.

Antibody—Immunoglobulin produced by immune system cells that recognizes and binds to a specific foreign substance (antigen).

Antigen—Foreign substance that is recognized by a specific antibody.

Autosomal dominant—Genetic trait that is expressed when present on only one of a pair of non-sex-linked chromosomes.

B cell (B lymphocyte)—Type of white blood cell that produces antibodies.

Bence-Jones protein—Light chain of an immunoglobulin that may be overproduced in Waldenstrom's macroglobulinemia; it is excreted in the urine.

Biopsy—Removal of a small sample of tissue for examination under a microscope; used in the diagnosis of cancer.

Cryoglobulinemia—Condition in which protein in the blood forms particles in the cold, blocking blood vessels and leading to pain and numbness of the extremities.

Hyperviscosity—Thick, viscous blood, caused by the accumulation of large proteins, such as immunoglobulins, in the serum.

Immunoelectrophoresis—Use of an electrical field to separate proteins in a mixture (such as blood or urine), on the basis of the size and electrical charge

of the proteins; followed by the detection of an antigen (such as IgM), using a specific antibody.

Immunoglobulin (Ig)—Antibody such as IgM; large protein produced by B cells that recognizes and binds to a specific antigen.

Interferon alpha—Potent immune-defense protein; used as an anti-cancer drug.

Lymphatic system—The vessels, lymph nodes, and organs, including the bone marrow, spleen, and thymus, that produce and carry white blood cells to fight disease.

Lymphoma—Cancer that originates in lymphatic tissue.

M protein—Monoclonal or myeloma protein; IgM that is overproduced in Waldenstrom's macroglobulinemia and accumulates in the blood and urine.

Monoclonal—Identical cells or proteins; cells (clones) derived from a single, genetically-distinct cell, or proteins produced by these cells.

Plasma cell—Type of white blood cell that produces antibodies; derived from an antigen-specific B cell.

Plasmapheresis—Plasma exchange transfusion; the separation of serum from blood cells to treat hyperviscosity of the blood.

Platelet—Cell that is involved in blood clotting.

Stem cell—Undifferentiated cell that retains the ability to develop into any one of numerous cell types.

Diagnosis

Since many individuals with WM have no symptoms, the initial diagnosis may result from blood tests that are performed for some other purpose. Blood cell counts may reveal low red blood cell and platelet levels.

A physical examination may indicate enlargement of the lymph nodes, spleen, and/or liver. A retinal eye examination with an ophthalmoscope may show retinal veins that are enlarged or bleeding.

Blood and urine tests

Serum protein electrophoresis is used to measure proteins in the blood. In this laboratory procedure, serum proteins are separated in an electrical field, based

on the size and electrical charge of the proteins. Serum immunoelectrophoresis uses a second antibody that reacts with IgM. A spike in the Ig fraction indicates a large amount of identical or monoclonal IgM in individuals with WM.

Normal serum contains 0.7-1.6 gm per deciliter (g/dl) of Ig, with no monoclonal Ig present. At serum IgM concentrations of 3-5 g/dl, symptoms of hyperviscosity often are present. However some individuals remain asymptomatic with IgM levels as high as 9 g/dl.

Urinalysis may indicate protein in the urine. A urine Bence-Jones protein test may indicate the presence of these small, partial Igs.

Bone marrow

Abnormal blood tests usually are followed by a bone marrow biopsy. In this procedure, a needle is inserted into a bone and a small amount of marrow is removed. Microscopic examination of the marrow may reveal elevated levels of lymphocytes and plasma cells. However, less than 5% of patients with WM have lytic bone lesions, caused by cancerous plasma cells in the bone marrow that are destroying healthy cells. Bone lesions can be detected with x rays.

Treatment

Clinical staging, to define how far a cancer has spread through the body, is the common method for choosing a cancer treatment. However, there is no generally-accepted staging system for WM.

There also is no generally-accepted course of treatment for WM. Treatment may not be necessary for asymptomatic macroglobulinemia. However, if IgM serum levels are very high, treatment may be initiated even in the absence of symptoms. If symptoms are present, treatment is directed at relieving symptoms and retarding the disease's development. Of major concern is the prevention or alleviation of blood hyperviscosity. Therefore, the initial treatment depends on the viscosity of the blood at diagnosis.

Hyperviscosity

Plasmapheresis, or plasma exchange **transfusion**, is a procedure for thinning the blood. In this treatment, blood is removed and passed through a cell separator that removes the plasma, containing the IgM, from the red and white blood cells and platelets. The blood cells are transfused back into the patient, along with a plasma substitute or donated plasma. Plasmapheresis relieves many of the acute symptoms of WM. Individuals with WM may be given fluid to counter the effects of hyperviscous blood.

Low blood cell counts

Treatments for low blood cell levels include:

- the drug Procrit to treat anemia
- transfusions with packed red blood cells to treat anemia in later stages of the disease
- antibiotics to treat infections caused by a deficiency in white blood cells
- transfusions with blood platelets

Chemotherapy

Chemotherapy, the use of anti-cancer drugs, helps to slow the abnormal development of plasma cells, but

does not cure WM. It can reduce the amount of IgM in the bone marrow. In particular, chemotherapy is used to treat severe hyperviscosity and anemia that are caused by WM.

Chlorambucil (Leukeran), possibly in combination with prednisone, is the typical chemotherapy choice for WM. This treatment is effective in 57% of cases. These drugs are taken by mouth. Prednisone is a corticosteroid that affects many body systems. It has anti-cancer and anti-inflammatory effects and is an immune system suppressant. Other drug combinations that are used to treat WM include cyclophosphamide (Cytoxan), vincristine, and prednisone, with or without doxorubicin. Fludarabine, 2-chlorodeoxyadenosine, and **corticosteroids** also may be used.

side effects of chemotherapy may include:

- mouth sores
- nausea and indigestion
- hair loss
- increased appetite
- nervousness
- insomnia

These side effects disappear after the chemotherapy is discontinued.

The long-term management of WM usually is accomplished through a combination of plasmapheresis and chemotherapy.

Alternative treatment

Biological therapy or immunotherapy, with the potent, immune system protein interferon alpha, is used to relieve the symptoms of WM. Interferon alpha works by boosting the body's immune response. Interferon can cause flu-like symptoms, such as **fever**, chills, and fatigue. It also can cause digestive problems and may affect blood pressure.

The drug rituximab, an antibody that is active against antibody-producing cells, is effective in about 30% of individuals with WM. Rituximab is a monoclonal antibody produced in the laboratory. Monoclonal antibody treatment may cause a an allergic reaction in some people.

Prognosis

There is no cure for WM. In general, patients go into partial or complete remission following initial treatments. However the disease is not cured and follow-up treatment may be necessary.

The prognosis for this cancer depends on an individual's age, general health, and genetic (hereditary) make-

up. Males, individuals over age 60, and those with severe anemia have the lowest survival rates. The Revised European American Lymphoma (REAL) classification system gives WM a good prognosis following treatment, with an average five-year survival rate of 50-70%. However, many people with WM live much longer, some without developing any symptoms of the disease. About 16-23% of individuals with WM die of unrelated causes.

Prevention

There is no known prevention for WM.

Resources

BOOKS

- Drum, David. *Making the Chemotherapy Decision*. 2nd ed. Los Angeles: Lowell House, 1996.
- Kyle, Robert A. "Plasma Cell Disorders". In *Cecil Textbook of Medicine*, edited by J. Claude Bennett and Fred Plum. Philadelphia: W. B. Saunders, 1996.
- Longo, Dan. L. "Plasma Cell Disorders". In *Harrison's Principles of Internal Medicine*, edited by Anthony S. Fauci, et al. New York: McGraw-Hill, 1998.
- Sutcliffe, Simon B., ed. *Lymphoma and You: A Guide for Patients Living with Hodgkin's Disease and Non-Hodgkin's Lymphoma*. Toronto: The Medicine Group Ltd., 1998.

ORGANIZATIONS

- Cure for Lymphoma Foundation. 215 Lexington Ave., New York, NY 10016. (212) 213-9595. (800)-CFL-6848. infocfl@cfl.org. <<http://www.cfl.org/home.html>>. An advocacy organization; education and support programs, research grants, information on clinical trials for Hodgkin's and non-Hodgkin's lymphomas.
- International Waldenstrom's Macroglobulinemia Foundation. 2300 Bee Ridge Road, Sarasota, FL 34239-6226. (941) 927-IWMF. <<http://www.iwmf.com>>. Information, educational programs, support for patients and families, research support.
- The Leukemia and Lymphoma Society. 600 Third Ave., New York, NY 10016. (800) 955-4572. (914) 949-5213. <<http://www.leukemia-lymphoma.org>>. Information, support, and guidance for patients and health care professionals.
- The Lymphoma Research Foundation of America, Inc. 8800 Venice Boulevard, Suite 207, Los Angeles, CA 90034. (310) 204-7040. <<http://www.lymphoma.org>>. Research into treatments for lymphoma; educational and emotional support programs for patients and families.

OTHER

- Complementary and Alternative Therapies for Leukemia, Lymphoma, Hodgkin's Disease and Myeloma*. The Leukemia and Lymphoma Society. 27 Mar. 2001. 28 June 2001. <<http://www.leukemia-lymphoma.org>>.
- "Macroglobulinemia of Waldenstrom." WebMD. 1999. 14 Apr. 2001. 28 June 2001. <http://my.webmd.com/content/asset/adam_disease_macroglobulinemia-primary>.

McKusick, Victor A. "Macroglobulinemia, Waldenstrom; WM." *Online Mendelian Inheritance in Man*. John Hopkins University. 28 Dec. 1999. 28 June 2001. <<http://www.ncbi.nlm.nih.gov:80/entrez/dispmim.cgi?id=153600>>.

"Multiple Myeloma and Other Plasma Cell Neoplasms." CancerNet. National Cancer Institute. Mar. 2001. 28 June 2001. <<http://cancernet.nci.nih.gov>>.

"Non-Hodgkin's Lymphoma." Cancer Resource Center. American Cancer Society. 20 Dec 1998. 28 June 2001. <http://www3.cancer.org/cancerinfo/load_cont.asp?ct=32&st=wi>.

Waldenstroms.com. International Waldenstrom's Macroglobulinemia Foundation. 28 June 2001. <<http://www.iwmf.com>>.

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Walleye see **Strabismus**

Warts

Definition

Warts are small, benign growths caused by a viral infection of the skin or mucous membrane. The virus infects the surface layer. The viruses that cause warts are members of the human papilloma virus (HPV) family. Warts are not cancerous but some strains of HPV, usually not associated with warts, have been linked with **cancer** formation. Warts are contagious from person to person and from one area of the body to another on the same person.

Description

Particularly common among children, young adults, and women, warts are a problem for 7-10% of the population. There are close to 60 types of HPV that cause warts, each preferring a specific skin location. For instance, some types of HPV cause warts to grow on the skin, others cause them to grow inside the mouth, while still others cause them to grow on the genital and rectal areas. However, most can be active anywhere on the body. The virus enters through the skin and produces new warts after an incubation period of one to eight months. Warts are usually skin-colored and feel rough to the touch, but they also can be dark, flat, and smooth.

Warts are passed from person to person, directly and indirectly. Some people are continually susceptible to warts, while others are more resistant to HPV and seldom get them. The virus takes hold more readily when



Cluster of warts on finger. (Custom Medical Stock Photo. Reproduced by permission.)

the skin has been damaged in some way, which may explain why children who bite their nails tend to have warts located on their fingers. People who take a medication to suppress their immune system or are on long-term steroid use are also prone to a wart virus infection. This same is true for patients with AIDS.

Causes and symptoms

The more common types of warts include:

- common hand warts
- foot warts
- flat warts
- **genital warts**

Hand warts

Common hand warts grow around the nails, on the fingers, and on the backs of hands. They appear more frequently where skin is broken, such as in areas where fingernails are bitten or hangnails picked.

Foot warts

Foot warts are called plantar warts because the word plantar is the medical term for the sole of the foot, the area where the wart usually appears as a single lesion or as a cluster. Plantar warts, however, do not stick up above the surface like common warts. The ball of the foot, the heel and the plantar part of the toes are the most likely locations for the warts because the skin in those areas is subject to the most weight, pressure and irritation, making a small break or crack more likely.

Plantar warts are familiar to all ages groups, appearing frequently in children between the ages of 12-16. Adolescents often come into contact with a wart virus in a locker room, swimming pool area, or by walking barefooted on dirty surfaces. The blood vessels feeding them are the black dots that are visible on the wart. If left untreated, these warts can grow to an inch or more in circumference and spread into clusters of several warts. They are known to be very painful at times, the **pain** usually compared to the feeling of a permanent stone in the shoe particularly if the wart is on a pressure point of the foot. People with **diabetes mellitus** are prone to complications from plantar warts related to the development of sores or ulceration and the poor healing potential associated with diabetes.

Flat warts

Flat warts tend to grow in great numbers and are smaller and smoother than other warts. They can erupt anywhere, appearing more frequently on the legs of women, the faces of children, and on the areas of the face that are shaved by young adult males.

Genital warts

Genital warts, also called condyloma acuminata or venereal warts, are one of the most common causes of sexually transmitted disease (STD) in this country. According to the *Journal of the American Medical Association's* STD Information Center, they are contracted by sexual contact with an infected person who carries HPV and are more contagious than other warts. It is estimated that two-thirds of the people who have sexual contact with a partner with genital warts will develop the disease within three months of contact. As a result, about one million new cases of genital warts are diagnosed in the United States each year.

Genital warts tend to be small flat bumps or they may be thin and tall. They are usually soft and not scaly like other warts. In women, genital warts appear on the genitalia, within the vagina, on the cervix, and around the anus or within the rectum. In men, genital warts usually appear on the tip of the penis but may also be found on the scrotum or around the anus. Genital warts can also develop in the mouth of a person who has had oral sexual contact with an infected person.

Diagnosis

Patients who notice warts in their genital area should see a doctor. The doctor may be able to diagnose the warts with a simple examination. If the warts are small, the doctor may put a vinegar-like liquid on the skin, which makes the warts turn white and easier to see, and then use a magnifying glass to look for them.

Treatment

Home/self treatment

Many of the nonprescription wart remedies available at drug stores will remove simple warts from hands and fingers. These medications may be lotions, ointments, or plasters and work by chemically removing the skin that was affected by the wart virus. The chemicals are strong, however, and should be used with care since they can remove healthy as well as infected skin. These solutions should be avoided by diabetics and those with cardiovascular or other circulatory disorders whose skin may be insensitive and not appreciate irritation.

Flat warts are best treated with topical retinoids (retinoic acid) or a gel containing salicylic acid. The acid doesn't actually kill the wart virus, but waterlogs the skin so that the surface layer, with the virus, peels off. These products can take up to three months of treatment depending on the size and depth of the wart. Patches are also good to use. Rather than applying drops, a small pad is placed on the wart and left for 48 hours and then replaced with a new one. The patch usually contains a higher concentration of salicylic acid and may irritate the surrounding skin. If this occurs, patients should switch to a gel or stop medication for a period. To help the healing process for flat facial warts, men should shave with an electric shaver or temporarily grow a beard. Women with flat warts on areas that are shaved should use other methods to remove hair such as depilatory cream or wax.

Professional treatment

Physicians should be consulted if there are no signs of progress after a month of self treatment. Doctors have many ways of removing warts, including using stronger topically applied chemicals than those available in drugstores. Some of these solutions include podofilox, topical podophyllum, and trichloracetic acid (TCA). Some burning and discomfort for one or more days following treatment can be expected. Although these chemicals are effective, they may not destroy all warts completely. A second method of removal is freezing or cryosurgery on the wart using liquid nitrogen. **Cryotherapy** is relatively inexpensive, does not require anesthesia, and usually does not result in scarring. Although temporarily uncomfortable, it provides an effective and safe way to deliver freezing temperatures to a particular area on the skin, and healing is usually quick. Physicians may also choose to burn the wart with liquid nitrogen or numb the skin and then scrape off the wart. Another removal process is electrocautery (electric burning), destroying the wart by burning it with an electric needle. **Laser surgery** is also becoming a more common option for removing warts.



Seborrheic warts appearing on this patient's back. (Custom Medical Stock Photo. Reproduced by permission.)

Genital warts are the most difficult to treat. They can be removed, but the viral infection itself cannot be cured. Often, because the warts are so small, more than one treatment may be needed. The virus continues to live in the deeper skin, which is why warts often return after they have been removed. Strong chemicals may be applied as well as surgical excision with or without electrocautery. This therapy requires a small operative procedure and a local anesthetic. Laser therapy, although more expensive, is often used for treating venereal warts that are more extensive. The use of lasers which vaporize the lesion can theoretically transmit the HPV. It is not at all clear, however, if this occurs.

There is no one recommended method for eliminating plantar warts. If detected early, cryotherapy is usually enough. However, they can be very resilient, requiring treatment over several months. Treatment ranges from the conservative approach of applying chemical solutions to the more aggressive option of surgery. Patients with diabetes or vascular disease are usually treated with the more conservative methods.

Alternative treatment

There are a variety of alternative approaches to the treatment of warts. The suggestions described below apply to common warts and plantar warts, not to genital or cervical warts. Since genital and cervical warts are transmitted sexually, they should be treated by a physician.

KEY TERMS

Condyloma acuminata—Another term for genital warts.

Cryotherapy—Freezing with liquid nitrogen for removal.

Endometritis—Inflammation of the endometrium or mucous membrane of the uterus.

Epidermis—The outer layer of human skin.

Human papilloma virus (HPV)—A family of viruses that causes hand warts, foot warts, flat warts and genital warts.

Retinoic acid—Vitamin A₁ acid which is used topically to treat acne.

Salicylic acid—An agent prescribed in the treatment of hyperkeratotic skin conditions and fungal infections.

For the treatment of common or plantar warts, alternative practitioners may recommend these remedies.

- Apply a paste made of vitamin C powder to the wart for one to two weeks.
- Place a crushed or sliced garlic clove over the wart for seven consecutive nights while sleeping.
- Soak the wart in water, put cross-hatches over it with a sterile needle, and apply drops of thuja (*Thuja occidentalis*) tincture onto the wart. Repeat the cross-hatching and tincture application until the wart is saturated with the tincture. Repeat several times each day for one to two weeks. (A tincture is an herbal extract made with alcohol.)
- Tape a piece of banana peel, latex side down, over the wart and leave it on overnight. Repeat nightly for one to two weeks.

Because warts are caused by a virus, general immune system support can be effective in helping to keep warts from coming back after treatment or to keep them from multiplying or growing. Eating a well balanced diet high in sources of **vitamins A, C, and E** can help strengthen the immune system. Avoiding **stress**, which is believed to compromise the immune system, is also helpful.

Prognosis

Even though genital warts may be removed, the virus itself continues to live. The HPV can cause tissue changes in the cervix of women with cervical infection. The gen-

eral recommendation for women who have a history of genital warts is to see their doctors every six months for Pap smears to monitor any changes that may occur.

For plantar warts, the treatment goal is to destroy the wart and its virus without causing much damage to healthy skin. It is not unusual for treatment to cause pain until the foot heals because of the weight put on the foot.

Prevention

Genital warts can be prevented by using condoms and avoiding unprotected sex. Barrier protection will not, however, prevent the spread of wart-causing HPV to uncovered areas such as the pubis and upper thighs. Plantar warts can be prevented by wearing shoes, changing shoes daily, keeping feet clean and dry, and not ignoring skin growths and changes in the skin.

Resources

BOOKS

- The Editors of Time-Life Books. *The Medical Advisor: The Complete Guide to Alternative and Conventional Treatments*. Alexandria, VA: Time Life, Inc., 1996.
 Moyer, Susan M., and Donna B. Fedus. *The All New Medical Book of Remedies for People Over 50*. Publications International, Ltd., 1995.
 Renner, John H. *The Home Remedies Handbook*. Publications International, Ltd., 1994.
 Stupik, Ramona. *AMA Complete Guide to Women's Health*. New York: Random House, 1996.

PERIODICALS

- Siwek, J. "Warts on the Hands." *Washington Post*, 19 Apr. 1995, 15
 Smith, Trevor. "Runners Focus on Your Feet." *Running & Fit-News*, June 1997, 4-5.
 "Warts." *Mayo Clinic Health Letter* (July 1993): 5.
 "What to do about Warts." *Consumer Reports on Health* (July 1997): 81-82.

ORGANIZATIONS

- American Academy of Dermatology. 930 N. Meacham Road, P.O. Box 4014, Schaumburg, IL 60168-4014. (847) 330-0230. <<http://www.aad.org>>.
 American Academy of Family Physicians. 8880 Ward Parkway, Kansas City, MO 64114. (816) 333-9700. <<http://www.aafp.org>>.
 American Podiatric Medical Association. 9312 Old Georgetown Road, Bethesda, MD 20814-1698. (301) 571-9200. <<http://www.apma.org>>.
 Dermatology College of Medicine, The University of Iowa, 200 Hawkins Dr., Iowa City, IO 52242. (319) 356-2274. <<http://tray.dermatology.uiowa.edu>>.

Ruthan Brodsky

Water pills see **Diuretics**

- Water therapy see **Hydrotherapy**
 Waterhouse-Friderichsen syndrome see
Meningococcemia
 Weber test see **Hearing tests with a tuning fork**

Wechsler intelligence test

Definition

The Wechsler Intelligence Scales are a series of standardized tests used to evaluate cognitive abilities and intellectual abilities in children and adults.

Purpose

The Wechsler Intelligence Scales for Children (regular, revised, and third edition) and Wechsler Preschool and Primary Scale of Intelligence are used as tools in school placement, in determining the presence of a learning disability or a developmental delay, in identifying giftedness, and in tracking intellectual development.

The Wechsler Adult Intelligence Scales (regular and revised) are used to determine vocational ability, to assess adult intellectual ability in the classroom, and to determine organic deficits. Both adult and children's Wechsler scales are often included in neuropsychological testing to assess the brain function of individuals with neurological impairments.

Precautions

Intelligence testing requires a clinically trained examiner. The Wechsler scales should be administered, scored, and interpreted by a trained professional, preferably a psychologist or psychiatrist.

Description

All of the Wechsler scales are divided into six verbal and five performance subtests. The complete test takes 60-90 minutes to administer. Verbal and Performance IQs are scored based on the results of the testing, and then a composite Full Scale IQ score is computed. Although earlier editions of some of the Wechsler Scales are still available, the latest revisions are described below:

Wechsler Adult Intelligence Scale-Revised (WAIS-R)

The WAIS-R, the 1981 revision of the original Wechsler Adult Intelligence Scale, is designed for adults,

age 16-74. The 11 subtests of the WAIS-R include information, digit span, vocabulary, arithmetic, comprehension, similarities, picture completion, picture arrangement, block design, object assembly, and digit symbol. An example of questions on the subtest of similarities might be: "Describe how the following pair of words are alike or the same—hamburger and pizza." A correct response would be "Both are things to eat."

Wechsler Intelligence Scale for Children, Third Edition (WISC-III)

The WISC-III subtests includes many of the same categories of subtests as the WAIS-R. In addition, there are two optional performance subtests: symbol search and mazes.

Wechsler Preschool and Primary Scale of Intelligence (WPPSI)

The WPPSI is designed for children age 4-6 $\frac{1}{2}$ years. The test is divided into six verbal and five performance subtests. The eleven subtests are presented in the following order: information, animal house and animal house retest, vocabulary, picture completion, arithmetic, mazes, geometric design, similarities, block design, comprehension, and sentences.

The 1997 Medicare reimbursement rate for psychological and neuropsychological testing, including intelligence testing, is \$58.35 an hour. Billing time typically includes test administration, scoring and interpretation, and reporting. Many insurance plans cover all or a portion of diagnostic psychological testing.

Normal results

The Wechsler Intelligence Scales are standardized tests, meaning that as part of the test design, they were administered to a large representative sample of the target population, and norms were determined from the results. The scales have a mean, or average, standard score of 100 and a standard deviation of 15. The standard deviation indicates how far above or below the norm the subject's score is. For example, a ten-year-old is assessed with the WISC-III scale and achieves a full-scale IQ score of 85. The mean score of 100 is the average level at which all 10-year-olds in the representative sample performed. This child's score would be one standard deviation below that norm.

While the full-scale IQ scores provide a reference point for evaluation, they are only an average of a variety of skill areas. A trained psychologist will evaluate and interpret an individual's performance on the scale's subtests to discover their strengths and weaknesses and offer recommendations based upon these findings.

KEY TERMS

Norms—Normative or mean score for a particular age group.

Representative sample—A random sample of people that adequately represents the test-taking population in age, gender, race, and socioeconomic standing.

Standard deviation—A measure of the distribution of scores around the average (mean). In a normal distribution, two standard deviations above and below the mean includes about 95% of all samples.

Standardization—The process of determining established norms and procedures for a test to act as a standard reference point for future test results.

Resources

BOOKS

Maddox, Taddy. *Tests: A Comprehensive Reference for Assessments in Psychology, Education, and Business*. 4th ed. Austin: Pro-ed, 1997.

Shore, Milton F., Patrick J. Brice, and Barbara G. Love. *When Your Child Needs Testing*. New York: Crossroad Publishing, 1992.

Wodrich, David L. *Children's Psychological Testing: A Guide for Nonpsychologists*. Baltimore: Paul H. Brookes Publishing, 1997.

PERIODICALS

Czubaj, Camilla Anne. "The Wechsler Adult Intelligence Scale—Revised, Revisited." *Education* 117, no. 3 (Winter 1997): 271-3.

Slate, John R., and Craig H. Jones. "WISC-III IQ Scores and Special Education Diagnosis." *The Journal of Psychology* 131, no. 1 (Jan. 1997): 119-120.

ORGANIZATIONS

American Psychological Association (APA). 750 First St. NE, Washington, DC 20002-4242. (202) 336-5700. <<http://www.apa.org>>.

The Catholic University of America. Washington, DC 20064. (800) 464-3742. <<http://www.ericae.net>>.

Paula Anne Ford-Martin

Wegener's granulomatosis

Definition

Wegener's granulomatosis is a very rare disease that affects many different organs and systems of the body. It

mainly attacks the respiratory system (sinuses, nose, windpipe, and the lungs) and the kidneys. One of the main features of the disease is an inflammation of the blood vessels (**vasculitis**). The inflammation narrows the blood vessels and reduces the blood flow to the affected organs. This destroys tissues and damages vital organs.

Description

Wegener's granulomatosis (WG) is not a contagious disease, and there is no evidence to suggest that it is hereditary either. It is a very rare disease, affecting only 1 in every 30,000-50,000 people. About 500 new cases are diagnosed each year. The disease can occur at any age, however, it mostly affects individuals in their 30s and 40s. It affects males and females equally. Ninety seven percent of all patients are Caucasian, 2% are Black and 1% are of another race.

Causes and symptoms

No viral, bacterial, or other causative agent has yet been identified for WG. It is thought to be an autoimmune disease, meaning that the body's immune system attacks "itself," that is, the body's own tissues.

Whenever there is an infection in the body, proteins called antibodies, which are capable of attacking the infectious agent, are formed in the blood. In WG, the antibodies that are formed are directed against the white blood cells of the immune system. They are therefore called "auto-antibodies" (antibodies against one's own body cells). These auto-antibodies bind to the blood cells and forms clumps known as immune complexes. The complexes accumulate in the tissues and the blood vessels, leading to a tumor-like (granulomatous) inflammation of the blood vessels. This slows down the blood flow to the different organs and tissues, causing damage and resulting in the many symptoms of WG.

The symptoms of WG, and the severity of the symptoms, vary from patient to patient. One of the most common features is a chronic runny nose and other cold-like symptoms that do not respond to standard treatment. The cold symptoms gradually worsen and could lead to **sinusitis** (inflammation of the sinuses), middle ear infection (**otitis media**), **cough**, coughing of blood, and inflammation of the lung (pleuritis and **pneumonia**). Other symptoms include **fever**, **fatigue**, loss of appetite, weight loss, joint **pain**, night sweats, change in urine color, and weakness.

Kidney (renal) disease is the most serious development of WG. Patients who do not have renal disease are said to have "Limited Wegener's."

Diagnosis

Early diagnosis is critical for the most effective treatment of the disease. However, there are no specific laboratory tests for WG. Blood tests are used to rule out other causes of the symptoms and to determine which organs are affected. The blood tests often show anemia (low red cell count) and high white blood cell counts. If the kidneys are involved, red blood cells are seen in the urine when viewed under a microscope. Also, blood tests aimed at measuring kidney function may show abnormalities.

Chest x rays are used to determine if the lungs are involved. **Computed tomography scans** (CT scans) of sinuses and lungs, and **kidney biopsy**, are also important tools used in diagnosing WG.

A specific type of antibody called anti-neutrophil cytoplasmic antibody (ANCA) is seen in the blood of about 90% of the patients with WG. The ANCA are a group of antibodies directed against the individual's own white blood cells (namely, the neutrophils). These anti-neutrophil cytoplasmic antibodies are also found in other inflammatory conditions and diseases (such as HIV infection). Though the ANCA test is useful, it cannot be used by itself to make a diagnosis of WG. However, the amount of ANCA in the blood can be measured and correlates well with the progression of the disease. When there is a relapse or a flare-up, the ANCA levels go up. Levels decrease when the disease is controlled by appropriate treatment.

Since there are no definitive laboratory tests for WG, and the initial symptoms of the disease are not very specific, it takes five to 15 months, on an average, to make a diagnosis of WG.

Treatment

Cyclophosphamide (Cytoxan) which is an anti-cancer drug, and **corticosteroids**, such as prednisone, are used to treat WG. These are powerful drugs that suppress the immune system. However, they are also very toxic and can have serious side effects. The patient has to be watched carefully by the doctors and the dosage of the drugs has to be adjusted, if needed.

Since the patient's immune system is suppressed while on these drugs, he or she is at an increased risk for contracting infections. Vaccinations for flu and pneumonia are recommended.

Prognosis

In the past, approximately 80% of the patients with untreated WG died within a year of contracting the disease and 90% died within two years. Today, however, the

KEY TERMS

Auto-antibodies—An antibody that is produced in, and reacts with, an antigen in the same person or animal.

Autoimmune disease—Any disease which causes tissue injury due to an immunological reaction of antibodies against the patient's own tissues.

Granulomatous—Resembling a tumor made of granular material.

Immune complexes—Clusters or aggregates of antigen and antibody bound together.

Vasculitis—Inflammation of the walls of the blood vessels.

prognosis has been dramatically improved. With appropriate treatment, patients can survive for much longer periods and lead relatively normal lives.

Approximately 50% of the patients with WG will have a relapse of the disease. This generally happens within two years of stopping the medication, but can occur at any point either during treatment or after stopping treatment. Therefore, it is extremely important that patients continue to see their doctors regularly even after stopping the medications.

Prevention

At present, there are no preventive measures known for Wegener's granulomatosis.

Resources

BOOKS

Harrison's Principles of Internal Medicine. Ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Merck Manual of Diagnosis and Therapy. 17th ed. Ed. Robert Berkow, et al. Rahway, NJ: Merck Research Laboratories, 1997.

ORGANIZATIONS

National Organization for Rare Disorders. P.O. Box 8923, New Fairfield, CT 06812-8923. (800) 999-6673. <<http://www.rarediseases.org>>.

Wegener's Foundation, Inc. 3705 South George Mason Drive, Suite 1813 South, Falls Church, VA 22041. (703) 931-5852.

Wegener's Granulomatosis Support Group, Inc. P.O. Box 28660, Kansas City, MO 64188-8660. (800) 277-9474. <<http://www.wgsg.org/wgsg>>.

Lata Cherath, PhD

- Weil's disease see **Leptospirosis**
- Wermer's syndrome see **Multiple endocrine neoplasia syndromes**
- Wernicke-Korsakoff disease see **Alcohol-related neurologic disease**
- Western equine encephalitis see **Arbovirus encephalitis**
- Western herbalism see **Herbalism, western**

Wheezing

Definition

Wheezing is a high-pitched whistling sound associated with labored breathing.

Description

Wheezing occurs when a child or adult tries to breathe deeply through air passages that are narrowed or filled with mucus as a result of:

- allergy
- infection
- illness
- irritation

Wheezing is most common when exhaling. It is sometimes accompanied by a mild sensation of tightness in the chest. **Anxiety** about not being able to breathe easily can cause muscle tension that makes matters worse.

Causes and symptoms

Wheezing is the symptom most associated with **asthma**. It can be caused by:

- exposure to allergens (food, pollen, and other substances, that cause a person to have an allergic reaction)
- fumes
- ice-cold drinks, or very cold air
- medication
- strenuous **exercise**
- weather changes.
- foreign objects trapped in the airway
- cystic fibrosis, and other genetic disorders
- respiratory illnesses like **pneumonia**, **bronchitis**, congestive **heart failure**, and **emphysema**

Diagnosis

A family physician, allergist, or pulmonary specialist takes a medical history that includes questions about **allergies**, or unexplained symptoms that may be the result of allergic reactions. If the pattern of the patient's symptoms suggests the presence of allergy, skin and blood tests are performed to identify the precise nature of the problem.

A **pulmonary function test** may be ordered to measure the amount of air moving through the patient's breathing passages. X rays are sometimes indicated for patients whose wheezing seems to be caused by chronic bronchitis or emphysema.

Treatment

Mild wheezing may be relieved by drinking plenty of juice, water, weak tea, and broth. Ice-cold drinks should be avoided.

A vaporizer can help clear air passages. A steam tent, created by lowering the face toward a sink filled with hot water, placing a towel over the head and sink, and inhaling the steam, can do likewise.

Bronchodilators (medications that help widen narrowed airways) may be prescribed for patients whose wheezing is the result of asthma.

Antibiotics are generally used to cure acute bronchitis and other respiratory infections. **Expectorants** (cough-producing medications) or bronchodilators are prescribed to remove excess mucus from the breathing passages.

If wheezing is caused by an allergic reaction, **antihistamines** will probably be prescribed to neutralize body chemicals that react to the allergen.

Medical emergencies

Breathing problems can be life-threatening. Immediate medical attention is required whenever an individual:

- turns blue or gray and stops breathing
- becomes extremely short of breath, and is unable to speak
- coughs up bubbly-pink or white phlegm
- seems to be suffocating
- develops a **fever** of 101°F (38.3°C) or higher
- wheezes most of the time, and coughs up gray or greenish phlegm

Alternative treatment

Certain **yoga** positions (Bridge, Cobra, Pigeon, and Sphinx) may relieve wheezing by improving breathing

control and reducing **stress**. Patients whose wheezing is related to asthma, chronic bronchitis, emphysema, or a severe allergic reaction may benefit from these techniques, but must continue to have their condition monitored by a conventional physician.

Prognosis

Mild wheezing caused by infection or acute illness usually disappears when the underlying cause is eliminated.

Some doctors believe that childhood respiratory infections may activate parts of the immune system that prevent asthma from developing.

Prevention

Stopping **smoking** can eliminate wheezing. So can reducing or preventing exposure to other substances that cause the problem.

Resources

BOOKS

The Editors of Time-Life Books. *The Medical Advisor: The Complete Guide to Alternative and Conventional Treatments*. Alexandria, VA: Time Life, Inc., 1996.

OTHER

- “Kids in Daycare Three Times as Likely to Have Wheezing Illnesses.” American Lung Association Page. 16 May 1998 <<http://www.lungusa.org>>.
- “Wheezing.” University of Michigan Health System Page. 7 May 1998 <http://www.mcare2.org/healthtips/home_care/wheezing.htm>.
- “Wheezing.” WebMD. 17 May 1998 <<http://my.webmd.com/index>>.

Maureen Haggerty

Whiplash

Definition

Whiplash is a sudden, moderate-to-severe strain affecting the bones, discs, muscles, nerves, or tendons of the neck.

Description

The neck is composed of seven small bones. Known as the cervical spine, these bones:

- support the head
- help maintain an unobstructed enclosure for the spinal cord

- influence the shape and structure of the spine
- affect posture and balance

About 1,000,000 whiplash injuries occur in the United States every year. Most are the result of motor vehicle accidents or collisions involving contact sports. When unexpected force jerks the head back, then forward the bones of the neck snap out of position and irritated nerves can interfere with flow of blood and transmission of nerve impulses. Pinched nerves can damage or destroy the function of body parts whose actions they govern.

Risk factors

Osteoarthritis of the spine increases the risk of whiplash injury. So do poor driving habits, driving in bad weather, or driving when tired, tense, or under the influence of alcohol or other drugs.

Causes and symptoms

Tension shortens and tightens muscles. **Fatigue** relaxes them. Either condition increases the likelihood that whiplash will occur and the probability that the injury will be severe.

Sometimes symptoms of whiplash appear right away. Sometimes they do not develop until hours, days, or weeks after the injury occurs. Symptoms of whiplash include:

- **pain** or stiffness in the neck, jaw, shoulders, or arms
- dizziness
- headache
- loss of feeling in an arm or hand
- nausea and vomiting

Depression and vision problems are rare symptoms of this condition.

Diagnosis

Whiplash is difficult to diagnose because x rays and other imaging studies do not always reveal changes in bone structure. Organs affected by nerve damage or reduced blood supply may generate symptoms not clearly related to whiplash.

Diagnosis is based on observation of the patient's symptoms, medical history, **physical examination**, and neurological studies to determine whether the spine has been injured.

Treatment

Medication, physical therapy, and supportive measures are used to treat whiplash. Chiropractors gently realign the spine to relax pinched nerves or improve blood flow. A patient whose symptoms are severe may

wear a soft, padded collar (Thomas collar or cervical collar) until the pain diminishes.

When pressure on the root of the nerve causes loss of strength or sensation in a hand or arm, a cervical **traction** apparatus may be recommended.

Self-care

Inflammation and cramping can be alleviated by wrapping ice or an ice pack in a thin towel and applying it to the injured area for 10-20 minutes every hour. After the first 24 hours, painful muscle spasms can be prevented by alternating cold packs with **heat treatments**. Letting a warm shower run on the neck and shoulders for 10-20 minutes twice a day is recommended. Between showers, warm towels or a heat lamp should be used to warm and soothe the neck for 10-15 minutes several times a day.

Improving posture is important, and gentle massage can be beneficial. Sleeping without a pillow promotes healing, and a cervical collar or small rolled towel pinned under the chin can provide support and prevent muscle fatigue.

Alcohol should be avoided. A chiropractor, primary care physician, or orthopedic specialist should be notified whenever a painful neck injury occurs. Another situation requiring attention is if the face or arm weaken or become painful or numb following a neck injury.

Prognosis

With treatment, whiplash can usually be cured in one week to three months after injury occurs. If nerve roots are damaged, numbness and weakness may last until recovery is complete.

Prevention

Chiropractors can recommend diet and **exercise** techniques to reduce **stress** and tension. Careful, defensive driving, wearing seatbelts, and using padded automobile headrests can lessen the likelihood of whiplash.

Resources

PERIODICALS

Sturzenegger, M., et al. "Presenting Symptoms and Signs after Whiplash Injury: The Influence of Accident Mechanisms." *Neurology* 44 (1994): 688.

OTHER

"Whiplash." ThriveOnline. 6 June 1995 <<http://thriveonline.oxygen.com>>.

"Whiplash." Loyola University Health System. 6 June 1998 <<http://www.luhs.org>>.

Haggerty, Maureen. "Whiplash." A Healthy Me Page. 7 June 1998 <<http://www.ahealthyme.com/topic/topic100587681>>.

Maureen Haggerty

Whipple's disease see **Malabsorption syndrome**

White blood cell count and differential

Definition

The white blood cell count and differential determine the number of white blood cells and the percentage of each type of white blood cell in a person's blood. These tests are included in general health examinations and help investigate a variety of illnesses, including infection, allergy, and leukemia.

Purpose

The white blood cell count provides a clue to the presence of illness. White cells protect the body by fighting infection and attacking foreign material. When extra white cells are needed, the bone marrow increases production.

There are five types of white cells, each with different functions: neutrophils, lymphocytes, monocytes, eosinophils, and basophils. The differential reveals if these cells are present in a normal distribution, or if one cell type is increased or decreased. This information helps diagnose specific types of illness.

Conditions or medications that weaken the immune system, such as **AIDS** or **chemotherapy**, cause a decrease in white cells. The white cell count detects dangerously low numbers of white cells.

Recovery from illness can be monitored by the white cell count. Counts continuing to rise or fall to abnormal levels indicate a worsening condition; counts returning to normal indicate improvement.

Description

Neutrophils increase in response to bacterial infection. They destroy bacteria by enveloping and digesting them, a process called phagocytosis. When many neutrophils are needed, they are released from the bone marrow as immature cells, called bands or stab cells.

Lymphocytes fight viral infections and some bacterial infections. Certain lymphocytes directly attack invading microorganisms; others produce antibodies that attack and destroy microorganisms and other foreign material. Large lymphocytes, called atypical lympho-

cytes, are seen during **infectious mononucleosis** and other illnesses.

Monocytes increase during severe infections, and other conditions. They remove debris and microorganisms by phagocytosis. Eosinophils and basophils increase in response to allergic reactions and parasitic infection.

White cell counts are usually done on an automated instrument. A sample of blood is mixed with a chemical to burst the red blood cells. The remaining white cells are counted by the instrument.

The differential is done by spreading a drop of blood on a microscope slide. The slide is stained with a special stain and examined under a microscope. One-hundred white cells are counted and identified as either neutrophils, bands, lymphocytes, monocytes, eosinophils or basophils. Any atypical or immature cells also are counted. Cells are identified by the shape and appearance of the nucleus, the color of cytoplasm (the background of the cell), and the presence and color of granules. The percentage of each cell type is reported. At the same time, red cells and platelets are examined for abnormalities in appearance. Some instruments perform an automated differential.

Both the white blood cell count (also called white count or leukocyte count) and the differential (also called diff) are covered by insurance. Results are available the same day.

Preparation

This test requires 7 mL of blood. A healthcare worker ties a tourniquet on the person's upper arm, locates a vein in the inner elbow region, and inserts a needle into that vein. Vacuum action draws the blood through the needle into an attached tube. Collection of the sample takes only a few minutes.

Aftercare

Discomfort or bruising may occur at the puncture site. Pressure to the puncture site until the bleeding stops reduces bruising; warm packs relieve discomfort. The person may feel dizzy or faint.

Normal results

Total white cell count 5,000-10,000/ μL . Neutrophils 50-60%. Lymphocytes 20-40%. Monocytes 2-6%. Eosinophils 1-4%. Basophils 0.5-1%. Bands 0-3%.

Abnormal results

The white cell count and differential are interpreted according to a person's clinical condition and medical history. **Leukocytosis** (a white count increased to over

KEY TERMS

Band—Immature neutrophil.

Basophil—White blood cell that increases in response to parasitic infections and allergic reactions.

Differential—Blood test that determines the percentage of each type of white blood cell in a person's blood.

Eosinophil—White blood cell that increases in response to parasitic infections and allergic reactions.

Leukocytosis—A white count increased to over 10,000/ μL .

Leukopenia—A white count decreased to less than 4,000/ μL .

Lymphocyte—White blood cell that fights viral and some bacterial infections by direct attack or the production of antibodies.

Monocyte—White blood cell that increases during a variety of conditions including severe infections. It removes debris and microorganisms by phagocytosis.

Neutrophil—White blood cell that increases in response to bacterial infection. It removes and kills bacteria through phagocytosis.

Phagocytosis—A process by which a white blood cell envelopes and digests debris and microorganisms to remove them from the blood.

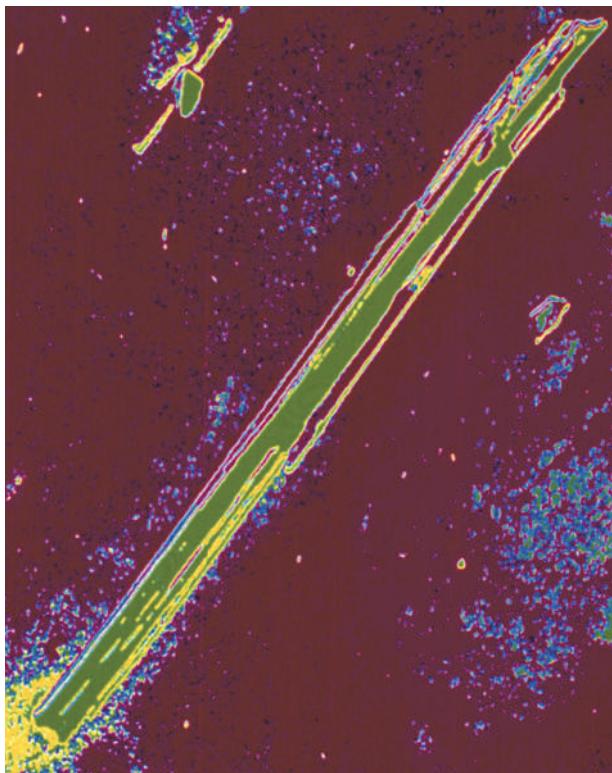
10,000/ μL) is seen in bacterial infections, inflammation, leukemia, trauma, and **stress**. Leukopenia (a white count decreased to less than 4,000/ μL) is seen in some viral infections or severe bacterial infections, and conditions that affect the bone marrow such as dietary deficiencies, chemotherapy, **radiation therapy**, and autoimmune diseases.

Nancy J. Nordenson

Whooping cough

Definition

Whooping **cough**, also known as pertussis, is a highly contagious disease which causes classic spasms



A magnified image of a pertussis toxin crystal that causes whooping cough. (National Institutes of Health/Custom Medical Stock Photo. Reproduced by permission.)

(paroxysms) of uncontrollable coughing, followed by a sharp, high-pitched intake of air which creates the characteristic “whoop” of the disease’s name.

Description

Whooping cough is caused by a bacteria called *Bordetella pertussis*. *B. pertussis* causes its most severe symptoms by attaching itself to those cells in the respiratory tract which have cilia. Cilia are small, hair-like projections that beat continuously, and serve to constantly sweep the respiratory tract clean of such debris as mucus, bacteria, viruses, and dead cells. When *B. pertussis* interferes with this normal, janitorial function, mucus and cellular debris accumulate and cause constant irritation to the respiratory tract, triggering coughing and increasing further mucus production.

Whooping cough is a disease which exists throughout the world. While people of any age can contract whooping cough, children under the age of two are at the highest risk for both the disease and for serious complications and **death**. Apparently, exposure to *B. pertussis* bacteria earlier in life gives a person some immunity against infection with it later on. Subsequent infections resemble the **common cold**.

Causes and symptoms

Whooping cough has four somewhat overlapping stages: incubation, catarrhal stage, paroxysmal stage, and convalescent stage.

An individual usually acquires *B. pertussis* by inhaling droplets infected with the bacteria coughed into the air by someone already suffering with the infection. Incubation is the symptomless period of seven to 14 days after breathing in the *B. pertussis* bacteria, and during which the bacteria multiply and penetrate the lining tissues of the entire respiratory tract.

The catarrhal stage is often mistaken for an exceedingly heavy cold. The patient has teary eyes, sneezing, **fatigue**, poor appetite, and an extremely runny nose (rhinorrhea). This stage lasts about 10-14 days.

The paroxysmal stage, lasting two to four weeks, begins with the development of the characteristic whooping cough. Spasms of uncontrollable coughing, the “whoop” sound of the sharp inspiration of air, and vomiting are all hallmarks of this stage. The whoop is believed to occur due to inflammation and mucus which narrow the breathing tubes, causing the patient to struggle to get air into his/her lungs; the effort results in intense exhaustion. The paroxysms (spasms) can be induced by over activity, feeding, crying, or even overhearing someone else cough.

The mucus which is produced during the paroxysmal stage is thicker and more difficult to clear than the more watery mucus of the catarrhal stage, and the patient becomes increasingly exhausted attempting to clear the respiratory tract through coughing. Severely ill children may have great difficulty maintaining the normal level of oxygen in their systems, and may appear somewhat blue after a paroxysm of coughing, due to the low oxygen content of their blood. Such children may also suffer from swelling and degeneration of the brain (encephalopathy), which is believed to be caused both by lack of oxygen to the brain during paroxysms, and also by bleeding into the brain caused by increased pressure during coughing. Seizures may result from decreased oxygen to the brain. Some children have such greatly increased abdominal pressure during coughing that hernias result (hernias are the abnormal protrusion of a loop of intestine through a weak area of muscle). Another complicating factor during this phase is the development of **pneumonia** from infection with another bacterial agent; the bacteria takes hold due to the patient’s already-weakened condition.

If the patient survives the paroxysmal stage, recovery occurs gradually during the convalescent stage, usually taking about three to four weeks. However, spasms of coughing may continue to occur over a period of months, especially when a patient contracts a cold, or other respiratory infection.

Diagnosis

Diagnosis based just on the patient's symptoms is not particularly accurate, as the catarrhal stage may appear to be a heavy cold, a case of the flu, or a simple **bronchitis**. Other viruses and **tuberculosis** infections can cause symptoms similar to those found during the paroxysmal stage. The presence of a pertussis-like cough along with an increase of certain specific white blood cells (lymphocytes) is suggestive of pertussis (whooping cough). However, cough can occur from other pertussis-like viruses. The most accurate method of diagnosis is to culture (grow on a laboratory plate) the organisms obtained from swabbing mucus out of the nasopharynx (the breathing tube continuous with the nose). *B. pertussis* can then be identified by examining the culture under a microscope.

Treatment

Treatment with the antibiotic erythromycin is helpful only at very early stages of whooping cough, during incubation and early in the catarrhal stage. After the cilia and the cells bearing those cilia, are damaged, the process cannot be reversed. Such a patient will experience the full progression of whooping cough symptoms; symptoms will only improve when the old, damaged lining cells of the respiratory tract are replaced over time with new, healthy, cilia-bearing cells. However, treatment with erythromycin is still recommended, to decrease the likelihood of *B. pertussis* spreading. In fact, all members of the household where a patient with whooping cough lives should be treated with erythromycin to prevent the spread of *B. pertussis* throughout the community. The only other treatment is supportive, and involves careful monitoring of fluids to prevent **dehydration**, rest in a quiet, dark room to decrease paroxysms, and suctioning of mucus.

Prognosis

Just under 1% of all cases of whooping cough cause death. Children who die of whooping cough usually have one or more of the following three conditions present:

- severe pneumonia, perhaps with accompanying encephalopathy
- extreme weight loss, weakness, and metabolic abnormalities due to persistent vomiting during paroxysms of coughing
- other pre-existing conditions, so that the patient is already in a relatively weak, vulnerable state (such conditions may include low birth weight babies, poor **nutrition**, infection with the **measles** virus, presence of other respiratory or gastrointestinal infections or diseases)

KEY TERMS

Cilia—Tiny, hair-like projections from a cell. In the respiratory tract, cilia beat constantly in order to move mucus and debris up and out of the respiratory tree, in order to protect the lung from infection or irritation by foreign bodies.

Encephalopathy—Swelling and degeneration of the brain.

Prevention

The mainstay of prevention lies in programs similar to the mass immunization program in the United States which begins immunization inoculations when infants are two months old. The pertussis vaccine, most often given as one immunization together with **diphtheria** and **tetanus**, has greatly reduced the incidence of whooping cough. Unfortunately, there has been some concern about serious neurologic side effects from the vaccine itself. This concern led huge numbers of parents in England, Japan, and Sweden to avoid immunizing their children, which in turn has led to major epidemics of disease in those countries. However, several carefully constructed research studies have disproved the idea that the pertussis vaccine is the cause of neurologic damage. Furthermore, a newer formulation of the pertussis vaccine is available. Unlike the old whole cell pertussis vaccine, which is composed of the entire bacterial cell which has been deactivated (and therefore unable to cause infection), the newer acellular pertussis vaccine does not use a whole cell of the bacteria, but is made up of (between two and five) chemical components of the *B. pertussis* bacteria. The acellular pertussis vaccine appears to greatly reduce the risk of unpleasant reactions to the vaccine, including high **fever** and discomfort following **vaccination**.

Resources

BOOKS

"Pertussis." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

Stoffman, Phyllis. *The Family Guide to Preventing and Treating 100 Infectious Diseases*. New York: John Wiley & Sons, 1995.

PERIODICALS

Jenkinson, Douglas. "Natural Course of 500 Consecutive Cases of Whooping Cough: A General Practice Population Study." *British Medical Journal* 310, no. 6975 (4 Feb. 1995): 299+.

Rosalyn Carson-DeWitt, MD

Wilderness medicine

Definition

Wilderness medicine encompasses the prevention, diagnosis, and treatment of injuries and medical conditions that may occur during activities in remote territories.

Purpose

Activities that may require wilderness medicine include backpacking, cross-country skiing, mountaineering, white water rafting, scuba diving, and exploration in undeveloped regions such as deserts or jungles. Wilderness medicine has evolved to deal with situations in which definitive medical care is hours or days away, and in which patients may require quick or extended attention. Wilderness medicine utilizes first aid techniques, but requires additional skills that take into account demanding environments, uncommon threats to health, hazardous or lengthy travel to medical facilities, and difficulties in obtaining food, water, and shelter.

Wilderness medicine uses techniques to assess and treat a variety of conditions and injuries, including:

- **wounds and burns**
- external and internal bleeding
- cardiac arrest
- head injuries
- spinal cord injuries
- **fractures** and dislocations
- **altitude sickness**
- problems from cold and heat
- allergic and anaphylactic reactions
- lightning strikes
- near drowning
- insect, reptile and animal bites
- poisoning
- emergency child birth

Precautions

In wilderness situations caregivers should follow the maxim of *first, do no harm*. Uninjured members of groups should not attempt rescues that place themselves in danger. People administering first aid or wilderness medicine should remain calm and organized at all times. Only those with experience should administer medications and medical procedures. Injured people should not be moved until they are fully evaluated, or unless environmental conditions are threatening and require immediate shelter.

People with certain medical conditions should avoid travel in the wilderness, which can make existing conditions worse. These conditions include metastatic **cancer**, peptic ulcers, **coronary artery disease**, chronic obstructive pulmonary disease, clotting or bleeding disorders, high-altitude sickness, chronic **rheumatoid arthritis**, chronic severe back **pain**, and chronic knee and hip joint disease.

Description

The first stage of wilderness medicine begins with an assessment of the injury or condition. Primary assessment is used to quickly determine if a patient is in a life-threatening situation and to provide immediate emergency care. Secondary assessment is the thorough evaluation of a patient after life-threatening circumstances are relieved.

Primary assessment

A rule of thumb for the first steps of primary assessment, recommended by the Wilderness Medicine Institute, is the ABCDE procedure. It stands for Airway, Breathing, Circulation, Disability, and Exposure assessment. First, a patient's airway should be checked by close observation of whether or not air can move in and out and any obstructions to breathing should be alleviated. In unconscious people the tongue can often fall to the back of the throat and block breathing and the head should be tilted back and the lower jaw raised to alleviate the obstruction. If neck or spinal cord injuries are suspected, the head must be handled with extreme care to avoid further injury to the delicate spinal cord. In these cases, the lower jaw can be pulled forward to open the airway. If the neck is severely out of alignment due to an injury or fall, it may be gently realigned to free the airway.

After the airway is cleared and breathing is ensured, a patient's circulation is checked by noting the pulse of the carotid artery, on the neck, the pulse of the femoral artery in the front groin, and by listening to the heartbeat. If pulse is lacking, **cardiopulmonary resuscitation (CPR)** may be required, which requires chest compression and mouth-to-mouth breathing. Circulation checks include surveying a patient for bleeding. If severe bleeding is present, it should be stopped by direct pressure to the injured area, and by elevating the wound level to the heart if possible.

Disability assessment means checking for damage to the spinal cord, particularly in the cervical region of the neck. Assessment of exposure determines if environmental conditions, such as heat or cold, are immediate threats to a patient's life, which may require actions such as seeking shelter or covering the patient with protective clothing.

Secondary assessment

During this stage, a thorough **physical examination** of the patient is made from head to toe to determine the extent of injuries or problems. Caretakers performing the assessment should write detailed notes in order to inform physicians or emergency workers later. Patients are thoroughly interviewed to determine the scope of problems and any previous medical issues that might be related. Patients should be spoken to calmly to determine their mental states and how well they respond to stimuli. Vital signs such as heart rate and respiration rate should be noted and monitored. The skin should be carefully observed for injuries, **boils**, **rashes**, and discoloration. Red or flushed skin may indicate **fever** or heat-related conditions, while pale or blotchy skin can point to **shock** or **hypothermia**. A bluish tint to the skin may mean a lack of oxygen. Contact lenses should be removed from patients in cold conditions, as they can freeze to the eyes. During secondary assessment the patient should be closely monitored over time until improvement is noted or further treatment decisions are made. At all times in wilderness injuries, shock must be watched for and immediately treated.

Shock

In wilderness situations shock should be suspected after traumatic injuries, significant loss of blood due to internal or external bleeding, extreme loss of fluids from vomiting or **diarrhea**, heart attacks, and spinal cord injuries. Shock is easiest to alleviate when it is treated early; when not treated properly, it can progress to unconsciousness and **death**. When the likelihood of shock occurs, patients should be continually monitored and supported.

Symptoms of shock begin with **anxiety** and restlessness, with increased heart rates and labored, shallow breathing. Shock victims tend to sweat profusely with cool and clammy skin. Thirst and nausea are also symptoms.

Shock is treated in the wilderness by maintaining an open airway for the patient to breathe, by treating any injuries such as bleeding wounds, by reducing pain if possible, and by replenishing fluids. Patients should be kept calm and warm and their feet should be elevated if possible to increase blood flow to the organs. If shock symptoms progress, plans should be quickly made to get help or evacuate the patient.

Evacuation

Evacuation of a patient may be a crucial decision in the wilderness, depending upon the severity of an injury or condition, the difficulty of moving the patient, the

time considerations involved, and the availability of outside help. In general if a patient with severe symptoms is not improving despite care then evacuation becomes necessary. The Wilderness Medical Society lists symptoms that require postponing travel or evacuating patients:

- progressive deterioration with symptoms of **dizziness**, **fainting**, abnormally slow (bradycardia) or fast (tachycardia) heart rate, labored breathing, poor mental status, progressive weakness, constant vomiting or diarrhea, intolerance of oral fluids, or recurrent loss of consciousness due to head injuries
- debilitating pain
- inability to sustain pace due to medical problems
- passage of blood by mouth or rectum
- symptoms of serious high-altitude illness
- infections that get worse despite treatment
- chest pain that is not musculoskeletal in origin
- psychological status threatening the individual or group

If a patient cannot be moved without risk of further injury, then other members of a party, preferably two or more, should be sent to get outside help. When requesting outside assistance, the safety of incoming rescuers and time constraints should be weighed. Requests for outside help should be made in writing, and include an assessment of the patient and situation as well as a detailed location of the incident. In some regions, helicopter evacuation may be an option, and should be used if an injury is life-threatening.

During evacuation patients must be handled with extreme care, as well as insulated from heat, cold and further injuries. Larger wilderness expeditions may have special devices available for transporting injured members, while smaller parties may have to improvise transporting devices by using backpacks, ropes and other available materials.

Wounds and burns

In wilderness situations wound management strives to stop bleeding, prevent infection, and speed healing. Bleeding from wounds should be controlled by direct pressure. Wounds and burns should be cleaned gently and thoroughly, treated with antibiotic ointment, and covered with bandages to avoid infections. Wounds that have high risks of infections, such as large cuts, open fractures, and animal bites, should be watched closely.

External and internal bleeding

External bleeding should be stopped by direct pressure, such as firmly applying a clean bandage or compress

to an open wound. Secondary pressure may be applied to pressure points, such as the large arteries in the upper arm or groin, to slow bleeding. Tourniquets are recommended only in life-threatening situations, as they can cause complications and infections. Symptoms of internal bleeding include dizziness, fainting, rapid heartbeat, weak pulse, **shortness of breath**, thirst, loss of color, vomiting blood, blood in the feces or urine, and severe pain or swelling in the abdomen. If internal bleeding is suspected, medical help should be sought immediately. With all cases of significant blood loss, shock must be carefully considered.

Cardiac arrest

Cardiac arrest in the wilderness may require CPR, although CPR is less effective in remote regions that lack access to the **life support** technology that ambulances quickly supply. CPR should be administered to patients who have suffered near drowning, hypothermia, lightning strikes, and drug overdoses. CPR generally should not be administered in the wilderness if it endangers the rescuers, if the time of the cardiac arrest is unknown, if the patient appears to be dead or rigor mortis has set in, or if cardiac arrest was caused by severe trauma or lethal injuries.

Head injuries

Head injuries that do not cause loss of consciousness in the victim are rarely dangerous. Short-term loss of consciousness following head injuries is known as **concussion**, and these patients should be closely monitored for 24 hours, including waking them every three hours during sleep to check for mental alertness. For head injuries that cause prolonged unconsciousness, the airway and cervical spine must be protected. Severe brain injury is indicated by relapses into unconsciousness, bad headaches, bleeding from the ears, clear fluid draining from the nose, vomiting, persistent disorientation, personality changes, seizures, irregular heartbeat and breathing, and unequal or unreactive pupils. Severe head injuries must be treated by seeking immediate medical help or evacuation.

Spinal cord injuries

If spinal cord injuries are suspected, patients must be immobilized. Some expeditions or rescue teams may carry special splints or vests in their medical kits. If no such equipment is available, *spineboards* may be fashioned from available materials such as backpacks, poles, or ice axes to prevent unnecessary movement of the injured backbone.

Fractures and dislocations

Wilderness care for fractures recommends **immobilization** by using splints and slings. If manufactured

splints and slings are not available in the medicine kit, they can be improvised by using natural materials, ski poles, ice axes, clothing, or parts of backpacks. In the case of dislocations, standard wilderness procedure is to splint, tape and stabilize the injury in the current position. However, if circulation or nerve function is impaired, or if the injured person is in extreme pain, relocation may be necessary by realigning the injured area. Relocation is most effective if it is done immediately following the injury, before stiffness or muscle spasms set in.

Altitude sickness

Symptoms of altitude sickness include **headache**, nausea, **fatigue**, vomiting, and bluish skin. Ataxia, or loss of muscular control and balance indicates more severe altitude sickness. Altitude sickness can occur at altitudes above 8,000 feet. The best prevention of the condition is allowing plenty of time for acclimatization at high altitudes, drinking plenty of fluids, and eating a diet rich in carbohydrates. **Aspirin** or **acetaminophen** may be taken, while the drug acetazolamide (Diamox) can relieve symptoms of mild acute mountain sickness (AMS). Other related conditions, which can cause death, are high altitude cerebral **edema** (HACE), which causes fluid accumulation on the brain, and high altitude **pulmonary edema** (HAPE), which causes fluid in the lungs. The main treatment for acute mountain sickness is to rapidly descend to lower altitudes. In some cases oxygen may be available to ease symptoms.

Problems from cold and heat

Frostbite is localized tissue damage from exposure to cold, and is remedied by the slow warming of exposed parts, preferably in heated water. Hypothermia is the condition resulting from lowered body core temperature, and is a common affliction in wilderness medicine. Mild hypothermia occurs when the body's core temperature (measured rectally) falls from normal to 95°F (35°C) Fahrenheit. Moderate hypothermia gives temperatures between 90–95°F (32.2–35°C), while severe hypothermia occurs when a body's core temperature falls below 90°F (32.2°C). Symptoms include severe shivering, confusion, apathy, drowsiness, slurred speech, and impaired reflexes, and progresses to the point of unconsciousness.

Even cases of the mildest hypothermia must be cared for closely. Patients in whom hypothermia is suspected should be immediately warmed by gently removing wet clothing and providing dry clothing, blankets and shelter. They should be monitored for body temperature changes. Severe hypothermia cannot be remedied in the wilderness; victims must be immediately and gently evacuated. Warming severe hypothermia victims too

quickly is dangerous. Cardiopulmonary resuscitation (CPR) may be initiated on victims of severe hypothermia who have cardiac arrest. In cases of near drowning, hypothermia must always be suspected.

Illness from heat includes heat exhaustion and the more severe heat **stroke**. Symptoms include confusion, rapid weak pulse, cramps, dizziness, nausea, diarrhea, headache, and high measured temperatures. Sweating may or may not occur, and the skin may be clammy and blotched. The principle treatment for heat illness in the wilderness is immediate cooling of the patient, by providing shade, fanning, sponging and immersion in cold water. Heat exhaustion will correct itself with enough rest and water. Heat stroke is life threatening and requires immediate cooling and rehydration with fluids, preferably intravenous ones. Prevention of heat illness includes proper conditioning, protective clothing, and avoiding **dehydration**.

Insect, reptile, and animal bites

Wilderness medicine must deal with an array of **bites and stings**, from bears, snakes, reptiles, spiders, scorpions, bees, fish and ticks. Prevention includes knowledge of the threats in the region being explored, as well as packing appropriate supplies such as bee sting kits for anaphylactic shock and snakebite kits for venomous attacks. The goal of treatment is to stop bleeding, prevent infection, and alleviate envenomation, or exposure to poison. The Sawyer Extractor is a suction tool used to remove snake venom, while the Epipen and Ana-kit are available by prescription for anaphylactic shock due to stings and severe allergic reactions.

Preparation

Knowledge and sound planning can be the difference between success and disaster in the backcountry. Members of extended wilderness outings should undergo thorough examinations by their physicians and dentists prior to undertaking expeditions. People going on wilderness outings should begin in a state of sound physical fitness by undertaking appropriate conditioning programs, as well as becoming acclimatized to special conditions such as altitude or extreme temperatures. Those with medications should be aware of potential side effects and complications, and inform other members of their group. At least two, and preferably all, members of wilderness expeditions should be familiar with first aid, wilderness medicine and rescue procedures. All members of wilderness outings should carry appropriate clothing, equipment, food, water, and first aid supplies. Trip itineraries should be recorded with park rangers or other official services. Means of communication with rescue facilities should be considered in advance in case emergencies arise.

Carrying adequate medical supplies is a crucial preparation for wilderness outings. These supplies will vary depending on the length of the trip and the region. Medical kits should contain basic first aid supplies such as bandages, dressings, pain relievers, water purification tablets, sunscreen, **antiseptics**, and ointments. Additional medical supplies include **antibiotics**, medications for gastrointestinal problems, **antihistamines** and emergency kits for **asthma** or allergic reactions, snake and insect bite kits, splints, and basic surgical supplies. Extended expeditions or those facing extreme conditions might include intravenous fluids, oxygen bottles for altitude problems, rescue gear and evacuation equipment, and specific medications for regional diseases and infections, such as **malaria**.

Immunizations are a very important preparation for those entering wilderness areas, particularly in Third World countries. Immunizations should be planned as far in advance as possible, as some take several weeks to become effective and others cannot be given together. Some immunizations that may be required, depending on the region, include **tetanus**, poliovirus, **measles**, **mumps**, **rubella**, **cholera**, **yellow fever**, meningococcus, hepatitis, bubonic **plague**, **typhoid fever** and **rabies**. See Resources below for sources of specific immunization information.

Several organizations provide training and certification for various levels of wilderness medicine. The most basic levels of preparation are first aid and first responder certifications, followed by outdoor emergency care (OEC) training. More rigorous training provides the wilderness first responder (WFR), the wilderness emergency medical technician (WEMT), or the wilderness prehospital emergency care (WPHEC) certifications. The most advanced level of wilderness medical certification is search and rescue (SAR) emergency care, which provides expertise in a sophisticated array of rescue techniques and equipment.

Resources

BOOKS

- Auerbach, Paul, MD. *Medicine for the Outdoors*. New York: The Lyons Press, 1999.
- Bowman, Warren, MD. *Outdoor Emergency Care*. Lakewood, CO: National Ski Patrol, 1998.
- Forgey, William, MD. *Wilderness Medical Society Practice Guidelines for Wilderness Emergency Care*. Merrillville, IN: ICS Books, 1995.
- Tilton, Buck, and Frank Hubbell, DO. *Medicine for the Backcountry*. Old Saybrook, CT: Globe Pequot, 1994.
- Wilkerston, James. *Medicine for Mountaineering and Other Wilderness Activities*. Seattle: The Mountaineers, 1992.

KEY TERMS

- Anaphylactic shock**—Severe allergic reaction characterized by airway constriction, tissue swelling, and lowered blood pressure.
- Cardiac arrest**—Heart failure or heart attack.
- Dislocation**—Displacement of bones at a joint.
- Envenomation**—Exposure to venom by bites or stings from insects, reptiles, and fish.
- Wilderness**—Large backcountry areas lacking roads, communication and other modern infrastructure.

ORGANIZATIONS

- International Association for Medical Assistance to Travelers (IAMAT). 417 Center St., Lewistown, NY 14092. (716) 754-4883.
- U.S. Centers for Disease Control. 1600 Clifton Road NE, Atlanta, GA 30333. (404) 639-1610. <<http://www.cdc.gov>>. Publishes *Health Information for International Travel*.
- Wilderness Medical Society. PO Box 2463, Indianapolis, IN 46204. (317) 631-1745.
- Wilderness Medicine Institute. PO Box 9, 413 Main Street, Pitkin, CO 81241. (970) 641-3572. <<http://www.wildernessmed.com>>.

Douglas Dupler

Wilms' tumor

Definition

Wilms' tumor is a cancerous tumor of the kidney that usually occurs in young children.

Description

When an unborn baby is developing, the kidneys are formed from primitive cells. Over time, these cells become more specialized. The cells mature and organize into the normal kidney structure. Sometimes, clumps of these cells remain in their original, primitive form. If these cells begin to multiply after birth, they may ultimately form a large mass of abnormal cells. This is known as a Wilms' tumor.

Wilms' tumor is a type of malignant tumor. This means that it is made up of cells that are significantly immature and abnormal. These cells are also capable of

invading nearby structures within the kidney and traveling out of the kidney into other structures. Malignant cells can even travel through the body to invade other organ systems, most commonly the lungs and brain. These features of Wilms' tumor make it a type of **cancer** that, without treatment, would eventually cause **death**. However, advances in medicine during the last 20 years have made Wilms' tumor a very treatable form of cancer.

Wilms' tumor occurs almost exclusively in young children. The average patient is about three years old. Females are only slightly more likely than males to develop Wilms' tumors. In the United States, Wilms' tumor occurs in 8.3 individuals per million in white children under the age of 15 years. The rate is higher among African-Americans and lower among Asian-Americans. Wilms' tumors are found more commonly in patients with other types of **birth defects**. These defects include:

- absence of the colored part (the iris) of the eye (aniridia)
- enlargement of one arm, one leg, or half of the face (hemihypertrophy)
- certain birth defects of the urinary system or genitals
- certain genetic syndromes (WAGR syndrome, Denys-Drash syndrome, and Beckwith-Wiedemann syndrome)

Causes and symptoms

The cause of Wilms' tumor is not completely understood. Because 15% of all patients with this type of tumor have other heritable defects, it seems clear that at least some cases of Wilms' tumor may be due to an hereditary alteration. It appears that the tendency to develop a Wilms' tumor can run in families. In fact, about 1.5% of all children with a Wilms' tumor have family members who have also had a Wilms' tumor. The genetic mechanisms associated with the disease are unusually complex.

Some patients with Wilms' tumor experience abdominal **pain**, nausea, vomiting, high blood pressure, or blood in the urine. However, the parents of many children with this type of tumor are the first to notice a firm, rounded mass in their child's abdomen. This discovery is often made while bathing or dressing the child and frequently occurs before any other symptoms appear. Rarely, a Wilms' tumor is diagnosed after there has been bleeding into the tumor, resulting in sudden swelling of the abdomen and a low red blood cell count (anemia).

About 5% of Wilms' tumor cases involve both kidneys during the initial evaluation. The tumor appears on either side equally. When pathologists look at these tumor cells under the microscope, they see great diversity in the types of cells. Some types of cells are associated

with a more favorable outcome in the patient than others. In about 15% of cases, physicians find some degree of cancer spread (metastasis). The most common sites in the body where metastasis occurs are the liver and lungs.

Researchers have found evidence that certain types of lesions occur before the development of the Wilms' tumor. These lesions usually appear in the form of stromal, tubule, or blastemal cells.

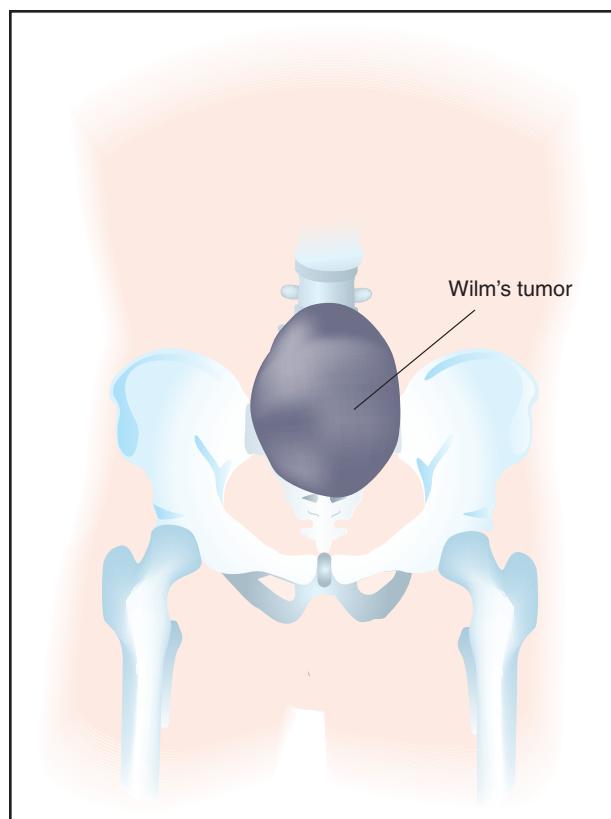
Diagnosis

Children with Wilms' tumor generally first present to physicians with a swollen abdomen or with an obvious abdominal mass. The physician may also find that the child has **fever**, bloody urine, or abdominal pain. The physician will order a variety of tests before imaging is performed. These tests mostly involve blood analysis in the form of a white blood cell count, complete **blood count**, **platelet count**, and serum calcium evaluation. Liver and kidney function testing will also be performed as well as a **urinalysis**.

Initial diagnosis of Wilms' tumor is made by looking at the tumor using various imaging techniques. Ultrasound and **computed tomography scans** (CT scans) are helpful in diagnosing Wilms' tumor. Intravenous pyelography, where a dye injected into a vein helps show the structures of the kidney, can also be used in diagnosing this type of tumor. Final diagnosis, however, depends on obtaining a tissue sample from the mass (biopsy), and examining it under a microscope in order to verify that it has the characteristics of a Wilms' tumor. This biopsy is usually done during surgery to remove or decrease the size of the tumor. Other studies (chest x rays, CT scan of the lungs, bone marrow biopsy) may also be done in order to see if the tumor has spread to other locations.

Treatment

Treatment for Wilms' tumor almost always begins with surgery to remove or decrease the size of the kidney tumor. Except in patients who have tumors in both kidneys, this surgery usually will require complete removal of the affected kidney. During surgery, the surrounding lymph nodes, the area around the kidneys, and the entire abdomen will also be examined. While the tumor can spread to these surrounding areas, it is less likely to do so compared to other types of cancer. In cases where the tumor affects both kidneys, surgeons will try to preserve the kidney with the smaller tumor by removing only a portion of the kidney, if possible. Additional biopsies of these areas may be done to see if the cancer has spread. The next treatment steps depend on whether/where the cancer has spread. Samples of the tumor are also exam-



Wilms' tumor. (Illustration by Argosy, Inc.)

ined under a microscope to determine particular characteristics of the cells making up the tumor.

Information about the tumor cell type and the spread of the tumor is used to decide the best kind of treatment for a particular patient. Treatment is usually a combination of surgery, medications used to kill cancer cells (**chemotherapy**), and x rays or other high-energy rays used to kill cancer cells (**radiation therapy**). These therapies are called adjuvant therapies, and this type of combination therapy has been shown to substantially improve outcome in patients with Wilms' tumor. It has long been known that Wilms' tumors respond to radiation therapy. Likewise, some types of chemotherapy have been found to be effective in treating Wilms' tumor. These effective drugs include dactinomycin, doxorubicin, vincristine, and cyclophosphamide. In rare cases, **bone marrow transplantation** may be used.

The National Wilms' Tumor Study Group has developed a staging system to describe Wilms' tumors. All of the stages assume that surgical removal of the tumor has occurred. Stage I involves "favorable" Wilms' tumor cells and is usually treated successfully with combination chemotherapy involving dactinomycin and vincristine and without abdominal radiation therapy. Stage II tumors

KEY TERMS

Biopsy—A procedure in which a small sample of tissue is removed, prepared, and examined with a microscope to determine the characteristics of the tissue's cells.

Blastemal—An immature material from which cells and tissues develop.

Cancer—A process where abnormal cells within the body begin to grow out of control, acquire the ability to invade nearby structures, and travel through the bloodstream in order to invade distant structures.

Malignant—Refers to cancer or cancer cells.

Sarcoma—A type of cancer that originates from connective tissue such as bone or muscle.

Stromal—A type of tissue that is associated with the support of an organ.

Tubule—Tissues and cells associated with the structures that connect the renal pelvis to the glomeruli.

involving a favorable histology (cell characteristics) are usually treated with the same therapy as Stage I. Stage III tumors with favorable histology are usually treated with a combination chemotherapy with doxorubicin, dactinomycin, and vincristine along with radiation therapy to the abdomen. Stage IV disease with a favorable histology is generally treated with combination chemotherapy with dactinomycin, doxorubicin, and vincristine. These patients usually receive abdominal radiation therapy and lung radiation therapy if the tumor has spread to the lungs.

In the case of Stage II through IV tumors with unfavorable, or anaplastic, cells, then the previously-mentioned combination chemotherapy is used along with the drug cyclophosphamide. These patients also receive lung radiation therapy if the tumor has spread to the lungs. Another type of tumor cell can be present in Stages I through IV. This cell type is called clear cell sarcoma of the kidney. If this type of cell is present, then patients receive combination therapy with vincristine, doxorubicin, and dactinomycin. All of these patients receive abdominal radiation therapy and lung radiation therapy if the tumor has spread to the lungs.

Prognosis

The prognosis for patients with Wilms' tumor is quite good, compared to the prognosis for most types of cancer. The patients who have the best prognosis are usu-

ally those who have a small-sized tumor, a favorable cell type, are young (especially under two years old), and have an early stage of cancer that has not spread. Modern treatments have been especially effective in the treatment of this cancer. Patients with the favorable type of cell have a long-term survival rate of 93%, whereas those with anaplasia have a long-term survival rate of 43% and those with the sarcoma form have a survival rate of 36%.

Prevention

There are no known ways to prevent a Wilms' tumor, although it is important that children with birth defects associated with Wilms' tumor be carefully monitored.

Resources

BOOKS

- Black, Timothy L. "Wilms' Tumor." In *Dambro: Griffith's 5-Minute Clinical Consult*. Philadelphia: J.B. Lippincott, 1999.
 "Wilms' Tumor." In *Cancer: Principles and Practice of Oncology*. DeVita, Vincent Jr., et al, eds. Philadelphia: J. B. Lippincott Company, 2001.
Cecil Textbook of Medicine. Goldman, Lee, et al, eds. Philadelphia: W.B. Saunders Company, 2000.

PERIODICALS

- Coppes, Max J., and Kathy Pritchard-Jones. "Principles of Wilms' Tumor Biology." *Urologic Clinics of North America* 27 (August 2000).
 Neville, Holly L., and Michael L. Ritchey. "Wilms' Tumor." *Urologic Clinics of North America* 27 (August 2000).

ORGANIZATIONS

- American Cancer Society. 1515 Clifton Rd. NE, Atlanta, GA 30329. (800) 227-2345. <<http://www.cancer.org>>.
 March of Dimes Birth Defects Foundation, National Office. 1275 Mamaroneck Ave., White Plains, NY 10605. <<http://www.modimes.org>>.

Mark A. Mitchell, M.D.

Wilson disease

Definition

Wilson disease is a rare, inherited disorder that causes excess copper to accumulate in the body. Steadily increasing amounts of copper circulating in the blood are deposited primarily in the brain, liver, kidneys, and the cornea of the eyes.

Description

Under normal conditions, copper that finds its way into the body through the diet is processed within the

liver. This processed form of copper is then passed into the gallbladder, along with the other components of bile (a fluid produced by the liver, which enters the small intestine in order to help in digestive processes). When the gallbladder empties its contents into the first part of the small intestine (duodenum), the copper in the bile enters and passes through the intestine with the waste products of digestion. In healthy individuals, copper is then passed out of the body in stool.

In Wilson disease, copper does not pass from the liver into the bile, but rather begins to accumulate within the liver. As copper levels rise in the liver, the damaged organ begins to allow copper to flow into the bloodstream, where it circulates. Copper is then deposited throughout the body, building up primarily in the kidneys, the brain and nervous system, and the eyes. Wilson disease, then, is a disorder of copper **poisoning** occurring from birth.

Wilson disease affects approximately one in 30,000 to one in 100,000 individuals and can affect people from many different populations. Approximately one in 90 individuals are carriers of the gene for Wilson disease.

Causes and symptoms

Wilson disease is inherited in an autosomal recessive manner. Autosomal recessive refers to the pattern of inheritance where each parent carries a gene for the disease on one of his or her chromosome pairs. When each parent passes on the chromosome with the gene for Wilson disease, the child will be affected with the disease. Both males and females can be affected with Wilson disease. If an individual is a carrier of the Wilson disease gene they do not have any symptoms of this disease. In order to be affected, an individual must inherit two copies of the gene, one from each parent. Many cases of Wilson disease may not be inherited but occur as a spontaneous mutation in the gene.

The gene for Wilson disease is located on chromosome number 13. The name of the gene is called ATP7B and is thought to be involved in transporting copper. As of 2001, over 70 different mutations of this gene have been identified, making diagnosis by **genetic testing** difficult.

Symptoms typically present between the ages of three and 60 with age 17 considered to be the average age a diagnosis is made. About half of all patients experience their first symptoms in the liver. The illness causes swelling and tenderness of the liver, sometimes with **fever**, mimicking more common disorders, such as viral hepatitis and **infectious mononucleosis**. Abnormal levels of circulating liver enzymes reveal that the liver is being seriously damaged. This form of damage is referred to as "fatty degeneration." Without medical

intervention, the liver damage will progress to actual **cirrhosis**. An often-fatal manifestation of liver disease is called fulminant hepatitis. This extremely severe inflammation of the liver (hepatitis) results in **jaundice**, fluid leaking into the abdomen, low protein circulating in the blood, abnormalities of the blood clotting system, swelling of the brain, and anemia due to the abnormal destruction of red blood cells.

Neurological symptoms are the first to occur in half of all patients due to copper accumulation in the brain and nervous system. The average age of onset for neurological symptoms is 21. These symptoms include **tremors** of the hands, uncontrollable movements of the limbs, stiffness, drooling, difficulty swallowing, difficulty talking, and **headache**. There is no change in patient's intelligence.

About one third of all patients with Wilson disease have a variety of psychiatric symptoms as the first signs of the disease. These symptoms include inability to cope, depression, irritability, increased anger, and inappropriate behavior. Often times patients have trouble completing tasks at work or in school.

Other symptoms that can affect patients with Wilson disease, and may occur before or after a diagnosis has been made include joint disorders, symptoms of arthritis and skeletal problems such as **osteoporosis**. Patients have occasionally been affected with **kidney stones**, abnormal handling of glucose in their body and women have menstrual cycle irregularities including stopping their regular cycle temporarily.

Diagnosis

The diagnosis of Wilson disease can be performed relatively easily through several different tests however because Wilson disease is so rare, diagnosis is often unfortunately delayed. The tests used to diagnose Wilson disease can be performed on patients who have and who have not already shown symptoms of the disease. It is extremely important to make a diagnosis as soon as possible since liver damage can occur before there are any signs of the disease.

An easy way to diagnose Wilson disease is to measure the amount of a glycoprotein found in the blood called ceruloplasmin. Low levels of ceruloplasmin can diagnose the disease in about 80% of affected patients. This procedure is not as effective for women taking birth control pills, pregnant women, or infants less than six months of age.

A second test involving an **eye examination** to detect a characteristic ring of copper deposited in a membrane of the cornea (referred to as Kayser-Fleischer rings) is very easy to perform and is very useful in diag-

KEY TERMS

Anemia—A blood condition in which the level of hemoglobin or the number of red blood cells falls below normal values. Common symptoms include paleness, fatigue, and shortness of breath.

Bile—A substance produced by the liver, and concentrated and stored in the gallbladder. Bile contains a number of different substances, including bile salts, cholesterol, and bilirubin.

Biopsy—The surgical removal and microscopic examination of living tissue for diagnostic purposes.

Cell—The smallest living units of the body which group together to form tissues and help the body perform specific functions.

Ceruloplasmin—A protein circulating in the bloodstream that binds with copper and transports it.

Chromosome—A microscopic thread-like structure found within each cell of the body and consists of a complex of proteins and DNA. Humans have 46 chromosomes arranged into 23 pairs. Changes in either the total number of chromosomes or their shape and size (structure) may lead to physical or mental abnormalities.

Cirrhosis—A chronic degenerative disease of the liver, in which normal cells are replaced by fibrous tissue. Cirrhosis is a major risk factor for the later development of liver cancer.

Deoxyribonucleic acid (DNA)—The genetic material in cells that holds the inherited instructions for growth, development, and cellular functioning.

Gallbladder—A small, pear-shaped organ in the upper right hand corner of the abdomen. It is connected by a series of ducts (tube-like channels) to the liver, pancreas, and duodenum (first part of the small intestine). The gallbladder receives bile from the liver, and concentrates and stores it. After a meal, bile is squeezed out of the gallbladder into the intestine, where it aids in digestion of food.

Gene—A building block of inheritance, which contains the instructions for the production of a particular protein, and is made up of a molecular sequence found on a section of DNA. Each gene is found on a precise location on a chromosome.

Glucose—One of the two simple sugars, together with galactose, that makes up the protein, lactose, found in milk. Glucose is the form of sugar that is usable by the body to generate energy.

Hepatitis—A viral disease characterized by inflammation of the liver cells (hepatocytes). People infected with hepatitis B or hepatitis C virus are at an increased risk for developing liver cancer.

Jaundice—Yellowing of the skin or eyes due to excess of bilirubin in the blood.

Toxic—Poisoinous.

nosing patients who have already exhibited symptoms. This test is not as effective in persons without symptoms. This diagnostic test cannot be used by itself to make a diagnosis because some patients with liver disease but not Wilson disease will test positive.

A third test for diagnosing Wilson disease involves measuring the amount of copper in the liver. This can be accomplished by sampling a portion of the liver, called a biopsy. This is one of the most effective ways in which to diagnose Wilson disease, however the procedure itself is more difficult to perform than the others.

Other tests are also useful, for example measuring the amount of copper passed into the urine daily (high in Wilson disease). Another lab test measures the ability of a patient's ceruloplasmin to bind with a form of copper (decreased in Wilson disease). And finally, as discussed under genetic profile, some patients can be diagnosed through a DNA test to determine whether or not they

carry two genes for Wilson disease. This test does not always provide to be useful in certain patients and is of most use when used to test the brothers and sisters of affected patients.

Treatment

Treatment involves life-long administration of either D-penicillamine or trientine hydrochloride. Both of these drugs remove copper deposits throughout the body by binding to the copper which is removed through the body in urine. Zinc acetate and a low copper diet are other ways in which to treat Wilson disease.

Penicillamine has a number of serious side effects:

- joint pain
- neurological problems
- systemic lupus erythematosus
- decreased production of all blood elements

- interference with clotting
- allergic reactions

Careful monitoring is necessary. When patients have side effects from penicillamine, the dose can sometimes be lowered to an effective level that causes fewer difficulties. Alternatively, steroid medications may be required to reduce certain sensitivity reactions. Trientine has fewer potential side effects, but must still be carefully monitored.

Treatment with zinc is also an effective way to remove excess copper from the body. Zinc is a metal that works to block copper absorption and bind copper in the intestinal cells until it is all released into the stool approximately one week later. The benefit of treatment with zinc is there are no toxic side effects however the zinc is a slower acting agent than the other drugs. It takes four to eight months for the zinc to be effective in reducing the overall amount of copper in the body.

Finally, patients with Wilson disease are encouraged to follow a diet low in copper, with an average copper intake of 1.0 mg/day. Foods to be avoided for the high levels of copper include liver and shellfish. Patients are also instructed to monitor their drinking water for excess levels of copper and drink distilled water instead.

Prognosis

Without treatment, Wilson disease is always fatal. With treatment, symptoms may continue to worsen for the first six to eight weeks. After this time, definite improvement should begin to be seen. However, it may take several years (two to five) of treatment to reach maximal benefit to the brain and liver. Even then, many patients are not returned to their original level of functioning. Patients with Wilson disease need to maintain some sort of anticopper treatment for the rest of their lives in order to prevent copper levels from rising in the body. Interruptions in treatment can result in a relapse of the disease which is not reversible, and can ultimately lead to **death**.

Resources

BOOKS

Scheinberg, I. Herbert. "Wilson's Disease." In *Harrison's Principles of Internal Medicine*, edited by Anthony S. Fauci, et al. 14th ed. New York: McGraw-Hill, 1998.

PERIODICALS

Gow, P.J., et al. "Diagnosis of Wilson's Disease: An Experience Over Three Decades." *Gut* 46(March 2000): 415-419.
 Hariharan, Ramesh, and L. Fred Herbert. "Wilson's Disease." *Hospital Practice* 31(August 15, 1996): 556+.
 Robertson, W.M. "Wilson's Disease." *Archives of Neurology* 57, no. 2 (February 2000): 276-7.

ORGANIZATIONS

American Liver Foundation. 75 Maiden Lane, Suite 603, New York, NY 10038. (800) 465-4837 or (888) 443-7222. <<http://www.liverfoundation.org>>.

National Organization for Rare Disorders (NORD). PO Box 8923, New Fairfield, CT 06812-8923. (203) 746-6518 or (800) 999-6673. Fax: (203) 746-6481. <<http://www.rarediseases.org>>.

Wilson's Disease Association. 4 Navaho Dr., Brookfield, CT 06804. (800) 399-0266.

OTHER

Wilson's Disease Association. <<http://www.medhelp.org/wda/wil.htm>>.

Katherine S. Hunt

Wiskott-Aldrich syndrome

Definition

Wiskott-Aldrich syndrome (WAS) is a rare inherited disorder marked by a low level of blood platelets, eczema, recurrent infections, and a high risk of leukemia or lymph node tumors.

Description

WAS was named for the two physicians who first reported the disorder. In 1937, Dr. A. Wiskott, a physician working in Munich, described two affected boys of German ancestry who had repeated infections, a skin rash, and poor blood-clotting ability. Nearly twenty years later, Dr. R.A. Aldrich reported similar symptoms in members of an American family of Dutch ancestry.

WAS is inherited as an X-linked genetic disorder and will therefore only affect males. The gene responsible for WAS is located on the short arm of the X chromosome. Since males have only one X chromosome they only have one copy of the gene. If that copy carries the abnormal gene, they will have WAS. In contrast, females have two X chromosomes. They will have a normal copy of the gene on one chromosome even if an abnormal gene is on the other because the abnormal gene is very rare. The normal copy on one X chromosome is usually sufficient to prevent females from having WAS. However, women who have one abnormal copy of the WAS gene are designated as carriers. While they will not have WAS, they have a 50% risk of passing the gene to each of their sons who will have WAS. Carrier females also have a 50% risk of passing the defective copy of the gene to their daughters who also become carriers."

Researchers identified the gene for WAS in 1994 and pinpointed its location on the short arm of the X chromosome. As of 2000, over 100 different mutations have been found in the gene among WAS patients. The fact that there are many mutations may explain some of the variability of symptoms among boys with WAS. However, even within the same family, affected individuals with the identical WAS gene mutation may have different degrees of severity of the disease. The mild form, X-linked **thrombocytopenia**, is also caused by mutations in this same gene.

The WAS syndrome affects one in every 250,000 male children and occurs worldwide. In the year 2000, scientists estimated that about 500 Americans have WAS.

Causes and symptoms

The syndrome is caused by a defect (mutation) in a specific gene called the WAS gene that normally codes for the protein named Wiskott-Aldrich Syndrome Protein (WASP). This vital protein is a component of cells that are important in the body's defense against infection (lymphocytes). The same protein also functions in the cells that help prevent bleeding (platelets). A less severe form of the disease, X-linked thrombocytopenia affects mainly the platelets.

Increased susceptibility to infections, eczema, and excessive bleeding are the hallmarks of WAS, although the symptoms can vary significantly from one patient to another. The immune system of patients with WAS produces too few B and T cells. B cells are the cells in the body that make antibodies. There are many types of T cells. Both B and T cells are needed to defend the body against infection. Because both types of cells are affected, WAS patients are subject to repeated infections from bacteria, fungi, and viruses. Ear infections, **meningitis**, and **pneumonia** are common in boys with WAS.

WAS patients also have thrombocytopenia, a decreased number of platelets. Platelets are the specialized blood cells that help to form blood clots and prevent uncontrolled bleeding. The platelets may also be smaller than normal. Some of the earliest symptoms of the syndrome are hemorrhage from **circumcision**, **bloody diarrhea**, and a tendency to bruise very easily.

Anemia and an enlarged spleen (splenomegaly) are seen in some patients. About 10% of patients develop malignancies, usually leukemia or tumors in the lymph nodes (non-Hodgkin's lymphoma).

Diagnosis

The diagnosis of WAS is usually suspected in male infants who have excessive bleeding, eczema, and fre-

quent bacterial or viral infections. Special blood tests can then be ordered to confirm WAS. The blood of Wiskott-Aldrich patients will show a low **platelet count** and a weak immune (antibody) response. It is also possible to confirm the diagnosis by obtaining a small sample of the patient's blood and analyzing the DNA for a mutation in the WAS gene. Knowledge of the exact mutation combined with information about how much WAS protein the defective gene can produce may help predict how severe a form of the disease an individual will have.

Carrier Testing

If the specific WAS gene mutation is identified in an affected child, that child's mother can then be tested to confirm that she carries the gene. Other members of the mother's family may also want to consider testing to find out if they carry the same gene mutation. The first step in studying other family members is for a geneticist or genetic counselor to obtain a detailed family history and construct a pedigree (family tree) to determine which family members should be offered testing.

Prenatal Diagnosis

In families where there has been one child born with WAS, prenatal testing should be offered in subsequent pregnancies. There 50% chance with each subsequent **pregnancy** that the mother, who is a carrier, will transmit the abnormal copy of the gene to her baby. The key is to first identify the particular WAS gene mutation in the child with WAS. Then, early in a pregnancy, cells can be obtained from the developing fetus by **chorionic villus sampling** or **amniocentesis**, and checked for the same mutation. Women who carry the abnormal WAS gene and are considering prenatal diagnosis should discuss the risks and benefits of this type of testing with a geneticist or genetic counselor.

Treatment

Standard treatments for individuals with WAS include **antibiotics** for infections and platelet transfusions to limit bleeding. Immune globulin is given to strengthen the individual's immune system. Eczema can be treated with corticosteroid creams applied directly to the skin. The spleen is sometimes removed to reduce the risk of bleeding. In individuals with WAS, however, removal of the spleen also increases the risk of infection unless antibiotics are given to prevent infections. About 50% of individuals with WAS are helped by treatment with transfer factor, which is a substance derived from the T cells of a healthy person. Transfer factor is given to improve both blood clotting and immune functions. **Bone marrow transplantation** has been successful in a

KEY TERMS

Amniocentesis—A procedure performed at 16-18 weeks of pregnancy in which a needle is inserted through a woman's abdomen into her uterus to draw out a small sample of the amniotic fluid from around the baby. Either the fluid itself or cells from the fluid can be used for a variety of tests to obtain information about genetic disorders and other medical conditions in the fetus.

Anemia—A blood condition in which the level of hemoglobin or the number of red blood cells falls below normal values. Common symptoms include paleness, fatigue, and shortness of breath.

Chorionic villus biopsy—A procedure used for prenatal diagnosis at 10-12 weeks gestation. Under ultrasound guidance a needle is inserted either through the mother's vagina or abdominal wall and a sample of cells is collected from around the early embryo. These cells are then tested for chromosome abnormalities or other genetic diseases.

Eczema—Inflammation of the skin with redness and other variable signs such as crusts, watery discharge, itching.

Gene—A building block of inheritance, which contains the instructions for the production of a particular protein, and is made up of a molecular sequence

found on a section of DNA. Each gene is found on a precise location on a chromosome.

Immune system—A major system of the body that produces specialized cells and substances that interact with and destroy foreign antigens that invade the body.

Mutation—A permanent change in the genetic material that may alter a trait or characteristic of an individual, or manifest as disease, and can be transmitted to offspring.

Platelets—Small disc-shaped structures that circulate in the blood stream and participate in blood clotting.

Prenatal diagnosis—The determination of whether a fetus possesses a disease or disorder while it is still in the womb.

Syndrome—A group of signs and symptoms that collectively characterize a disease or disorder.

Thrombocytopenia—A persistent decrease in the number of blood platelets usually associated with hemorrhaging.

X-linked—Located on the X chromosome, one of the sex chromosomes. X-linked genes follow a characteristic pattern of inheritance from one generation to the next.

number of cases. It has been most successful in boys under five years of age where the donor is a sibling whose tissue type closely matches that of the individual with WAS. As of 2000, attempts were also being made to treat individuals with WAS with umbilical cord blood from unrelated newborns in cases where the individual diagnosed with WAS has no matched sibling donor.

Prognosis

The prognosis for males diagnosed with Wiskott-Aldrich syndrome is poor. The average individual lives about four years; those who survive into adolescence often develop **cancer**. **Death** usually occurs from severe bleeding or overwhelming infection in the first few years of life.

Resources

BOOKS

Belmont, J. W., and J. M. Puck. "T Cell and Combined Immunodeficiency Disorders." In *The Metabolic & Molecular*

Bases of Inherited Disease, edited by C. R. Scriver, et al. New York: McGraw-Hill, 2001.

PERIODICALS

Kuska, B. "Wiskott-Aldrich Syndrome: Molecular Pieces Slide Into Place." *Journal of the National Cancer Institute* 92 (January 5, 2000): 9-11.

ORGANIZATIONS

Immune Deficiency Foundation. 40 W. Chesapeake Ave., Suite 308, Towson, MD 21204. (800) 296-4433. Fax: (410) 321-9165. <<http://www.primaryimmune.org/inside.htm>>.

OTHER

NORD—National Organization for Rare Disorders, Inc. <<http://www.rarediseases.org>>. "Entry 301000: Wiskott-Aldrich Syndrome." OMIM—*Online Mendelian Inheritance in Man*. <<http://www.ncbi.nlm.nih.gov/entrez/dispmim.cgi?id=301000>>.

Sallie Boineau Freeman, PhD

Withdrawal syndromes

Definition

Withdrawal syndrome occurs in drug and alcohol addicted individuals who discontinue or reduce the use of their drug of choice. This process of eliminating drugs and alcohol from the body is known as **detoxification**. **Anxiety**, **insomnia**, nausea, perspiration, body aches, and **tremors** are just a few of the physical and psychological symptoms of drug and alcohol withdrawal that may occur during detoxification.

Description

Drugs and alcohol affect mood by altering brain chemistry, specifically the production of neurotransmitters. Neurotransmitters are chemicals in the central nervous system that enable nerve impulses to travel through the central nervous system and regulate thought processes, behavior, and emotion. Drugs that temporarily elevate neurotransmitter levels are called stimulants. Drugs that decrease neurotransmitter levels and depress the central nervous system are called depressants; they include opiates and sedative-hypnotic drugs such as alcohol and **barbiturates**. (There are exceptions: Benzodiazepine elevates the level of an inhibitory neurotransmitter, GABA, therefore it serves as a tranquilizer)

When drug or alcohol consumption becomes chronic, the body adjusts to the constant presence of the substance by changing its normal production of neurotransmitters. If drug and alcohol use suddenly stops, the body and central nervous system react to the absence of the substance with an array of symptoms known collectively as withdrawal syndrome.

Causes and symptoms

Acute withdrawal syndrome begins within hours of abstinence, and includes a full range of physical and psychological symptoms. More long-term, or subacute, withdrawal symptoms, such as intense drug craving, may occur weeks or months after detoxification has taken place.

Alcohol withdrawal

Alcohol withdrawal syndrome occurs in alcohol-dependent individuals who suddenly stop or dramatically reduce their alcohol intake. The onset of the syndrome is likely to occur within a week, but usually occurs within 24 hours of the individual's last drink, and is triggered when the central nervous system attempts to adjust to the sudden absence of ethyl alcohol in the body. Symptoms may include extreme anxiety, disorientation, **hallucinations**,

sleep disorders, hand tremors, nausea, sweating, seizures, and racing pulse. **Delirium tremens** (DTs) are an extreme example of withdrawal. In the worst cases, untreated alcohol withdrawal syndrome can result in **death**.

Barbiturate withdrawal

Barbiturates are prescribed as anticonvulsants, sedatives, and general anesthetics. They can also mimic some of the characteristics of alcohol intoxication (including euphoria, elation, and uninhibited behavior), which make them candidates for abuse. Commonly abused barbiturates include amobarbital (Amytal), pentobarbital (Nembutal), and secobarbital (Seconal). These drugs depress the respiratory and nervous system functions; and, because abusers rapidly build up a tolerance to the effects of the drug, fatal overdose or **coma** can easily occur. Symptoms of withdrawal syndrome appear 12–20 hours after the last dose; they include anxiety, irritability, elevated heart and respiration rate, muscle **pain**, nausea, tremors, hallucinations, confusion, and seizures. Death is a possibility if the condition is left untreated. Because barbiturates decrease REM sleep (rapid eye movement sleep, during which dreaming takes place), withdrawal often results in sleep disruptions such as nightmares, insomnia, or vivid dreaming.

Opiate withdrawal

Opiates are powerfully addictive analgesic drugs that deaden nerve pathways related to pain. Abusers of propoxyphene (Darvon), meperidine (Demerol), perco-cet (Oxycodone), heroin, morphine, and other powerfully addictive opiates quickly build up a tolerance to the drugs and need progressively larger doses to achieve the desired effect. Stopping or reducing the intake of the drug can cause severe withdrawal symptoms, which begin six to eight hours after the last dosage. Symptoms are flu-like, and include gastrointestinal distress, anxiety, nausea, insomnia, muscle pain, fevers, sweating, and runny nose and eyes.

Stimulant withdrawal

Use of stimulants, such as **cocaine**, crack, amphetamines, and methamphetamines, cause an increase in neurotransmitters in the central nervous system and produce feelings of alertness and increased energy. This initial "rush" is followed by a longer period of neurotransmitter loss, characterized by depression, lethargy, and a craving for more stimulants—sometimes called a rebound effect. When a stimulant-dependent individual abstains from stimulant use, withdrawal symptoms, including depression, **fatigue**, insomnia, and loss of appetite, reflect this drop in neurotransmitter levels. Withdrawal typically takes one to two weeks.

Diagnosis

A detailed history of the patient's drug or alcohol use taken before detoxification can be helpful in predicting the severity of withdrawal symptoms. Standardized clinical tests, such as the Clinical Institute Withdrawal Assessment for Alcohol, revised, (CIWA-Ar), are used to evaluate the severity of withdrawal symptoms throughout the detoxification procedure.

Treatment

Pharmacologic and medical management is often recommended for withdrawal syndrome. The physical condition of the patient is closely monitored throughout the detoxification procedure.

Alcohol withdrawal

Alcohol withdrawal syndrome can be treated at home or in a hospital or treatment setting. Inpatient treatment is recommended for patients who are at risk for serious withdrawal symptoms or re-intoxication if treated as an outpatient. Withdrawal symptoms are minimized through the administration of cross-tolerant sedatives. Long-acting **benzodiazepines**, such as diazepam (Valium), chlordiazepoxide (Librium), and lorazepam (Ativan), are the pharmacologic treatment of choice in managing the symptoms of alcohol withdrawal. Drug dosage is adjusted to offset the discomfort of withdrawal, without causing a euphoric effect, and is then gradually decreased as withdrawal symptoms lessen.

Barbiturate withdrawal

Because the risk for seizures and other severe complications is high, barbiturate withdrawal should be monitored in a hospital setting. Patients are given low doses of phenobarbital at a regular interval until mild intoxication is achieved. The dosage amount and frequency is then gradually decreased until withdrawal is complete.

Opiate withdrawal

Two basic treatment approaches are used for managing opiate withdrawal. The first involves treating the symptoms of the withdrawal with appropriate medication. Clondine, an antihypertensive drug, is commonly prescribed to reduce muscle pain and cramping. Other symptom-specific drugs are administered on an as-needed basis.

The second treatment option is to replace the patient's drug of choice with **methadone**, a long-acting, cross-tolerant opiate that does not normally produce a "high." Doses of methadone are administered every four to six hours. The patient's reaction is closely observed, and dosages are slowly decreased until withdrawal symp-

KEY TERMS

Analgesics—Pain killing drugs that depress respiratory function. Opiates are analgesics.

Antagonist—A substance that tends to nullify the action of another.

Benzodiazepines—Sedatives used to treat anxiety, epilepsy, and alcohol withdrawal syndrome. Diazepam (Valium), alprazolam (Xanax), and chlordiazepoxide (Librium) are all benzodiazepines.

Cross-tolerant—A drug that has the same pharmacological effect as another is considered cross-tolerant. Cross-tolerant drugs are often used in treating withdrawal syndromes.

Detoxification—The process of physically eliminating drugs and/or alcohol from the system of a substance-dependent individual.

Dysphoria—A depressed and anxious mood state.

Neurotransmitters—Chemicals in the brain that affect the nervous system and alter thinking patterns.

Opiates—Analgesic, pain killing drugs, such as heroin and morphine that depress the central nervous system.

toms have disappeared, and dosages are then discontinued. Methadone withdrawal can be completed within three weeks. It is important to note that methadone withdrawal treatment differs from a methadone maintenance program, in which patients who are unwilling to give up opiates are prescribed methadone as a legal, long-term substitute for their drug of choice.

Rapid opiate detoxification (ROD) is an emerging treatment option for opiate withdrawal. The ROD method is reported to be faster and to cause less physical discomfort than traditional forms of opiate detoxification. The treatment is typically performed in a hospital or private clinic setting. Naltrexone, an opiate antagonistic that blocks opiate receptors and reverses the effects of opiates, is administered to trigger the withdrawal response. Clonidine is given simultaneously to ease the symptoms of withdrawal. The patient is anesthetized throughout the three to four hour procedure, and withdrawal occurs while the patient sleeps. Vital signs are monitored closely and a ventilator may be employed.

Stimulant withdrawal

Because of the depression and dysphoria (feeling of a psychological low) related to stimulant withdrawal,

psychological and/or medical management is critical. Treatment may include a regimen of drugs that increase neurotransmitter production.

Prognosis

A closely observed, medically managed detoxification typically results in a safe and tolerable withdrawal experience for the patient. Detoxification is only a short-term solution for obtaining abstinence. An **addiction** treatment and long-term recovery program is necessary to achieve long-term sobriety. Without such a treatment program, the likelihood of recurrence of abuse and, therefore, the recurrence of withdrawal syndrome is high.

Prevention

After detoxification, alcohol and drug dependent individuals are encouraged to maintain their abstinence through participation in substance abuse treatment or a twelve-step recovery program.

Resources

BOOKS

- Landry, Mim J. *Understanding Drugs of Abuse: The Processes of Addiction, Treatment, and Recovery*. Washington, DC: American Psychiatric Press, 1994.
Schuckit, Marc A. *Drug and Alcohol Use: A Clinical Guide to Diagnosis and Treatment*. 4th ed. New York: Plenum, 1995.

PERIODICALS

- Barttner, Thaddeus, and Lance Gooberman. "Rapid Opiate Detoxification." *American Journal of Drug and Alcohol Abuse* 22, no. 4 (Nov. 1996): 489-95.
Hall, Wayne, and Deborah Zador. "The Alcohol Withdrawal Syndrome." *The Lancet* 349, no. 9069 (June 1997): 1897-900.

ORGANIZATIONS

- Alcoholics Anonymous (A.A). General Service Office. 475 Riverside Drive, New York, NY 10015. (212) 870-3400. <<http://www.alcoholics-anonymous.org>>.
National Clearinghouse for Alcohol and Drug Information. Center for Substance Abuse Prevention. P.O. Box 2345, Rockville, MD 20847-2345. (800) 729-6686. <<http://www.health.org>>.
National Council on Alcoholism and Drug Dependence. 12 West 21st St., New York, NY 10010. (800) 622-2255. <<http://www.ncadd.org>>.
National Institute on Alcohol Abuse and Alcoholism (NIAAA). 6000 Executive Boulevard, Willco Building, Bethesda, Maryland 20892-7003. <<http://www.niaaa.nih.gov>>.

Paula Anne Ford-Martin

Wolff-Parkinson-White syndrome

Definition

Wolff-Parkinson-White syndrome is an abnormality in the electrical functioning of the heart which may cause rapid heart rates. The abnormality affects the electrical signal between the atria and ventricles.

Description

Blood is circulated through the heart and body by a muscular pump and valve system involving the atria and ventricles. The right atrium receives oxygen-lacking blood returning to the heart from the body. The blood is passed from the right atrium into the right ventricle, which contracts and sends blood out to the pulmonary artery. The pulmonary artery sends the blood into the lungs, where carbon dioxide is removed, and fresh oxygen is added. The left atrium receives blood with oxygen from the lungs and passes this arterial blood to the left ventricle, where it is emptied into the aorta, the main artery of the heart.

These functions are directed by electrical signals within the heart. In patients afflicted with Wolff-Parkinson-White syndrome, an abnormal pathway exists that causes additional electrical signals to pass between the atria and ventricles, possibly causing rapid heart rate.

Causes and symptoms

Congenital heart disease may contribute to this and other **arrhythmias**. Ebstein's anomaly, a congenital heart defect that involves displacement of the tricuspid valve, located on the right side of the heart, is one known cause of Wolff-Parkinson-White syndrome. This anomaly allows blood to flow via the small hole to the other side of the heart. Often, there is no known cause for Wolff-Parkinson-White syndrome. Many people with the syndrome have no symptoms. On the other hand, some people experience temporary rapid heartbeat due to certain drugs, **smoking**, and **anxiety**.

Diagnosis

Electrocardiography (ECG) is used to diagnose Wolff-Parkinson-White syndrome, and other cardiac arrhythmias. A trained physician, normally a cardiologist, can recognize patterns of electrical conduction. With this syndrome, the extra pathway will show a pattern different from those of normal conduction. If no irregular patterns show on the ECG, the patient may be

sent home with a 24-hour heart monitor, called a Holter monitor, which will help detect intermittent occurrences. Other studies, such as the cardiac electrophysiologic study (EPS), may be ordered to pinpoint the location of the accessory pathway, and to determine a course of treatment.

Treatment

Various drugs may be used to treat Wolff-Parkinson-White syndrome, as well as other cardiac arrhythmias. The purpose of these drugs is to slow the electrical signals and excitation of heart muscles. As some of these drugs may have side effects, including the rare production of new or more frequent arrhythmias, the patient should be carefully observed. Ablative therapies may be accomplished with radiofrequency or cardiac catheters to cut through the tissue which is causing the abnormal electrical signals.

At one time, only open heart surgery was used, but the procedure can be done now with local anesthesia in a special cardiac laboratory. In some cases, surgery may still be recommended to treat Wolff-Parkinson-White syndrome. Young people with this syndrome may be treated more successfully with surgery, rather than enduring a lifetime of drug treatments, or the possible threat of **sudden cardiac death**.

Alternative treatment

A provider may teach patients methods to help control heart rate. Relaxation techniques, **acupuncture**, botanical medicine, and **homeopathy** can all be helpful supportive therapies.

Prognosis

Most patients with this syndrome can lead normal lives, even with episodes of tachycardia. In many cases, the syndrome is secondary to the underlying congenital heart defect. However, Wolff-Parkinson-White syndrome can cause sudden cardiac arrest in certain instances.

Prevention

If the syndrome is not due to congenital heart disease, the patient may try avoiding behaviors which lead to arrhythmia, such as elimination of **caffeine**, alcohol, **cocaine**, and smoking.

Resources

BOOKS

Current Diagnosis. Vol. 9. Ed. Rex B. Conn, et al. Philadelphia: W. B. Saunders Co., 1997.

KEY TERMS

Ablative—Used to describe a procedure involving removal of a tissue or body part, or destruction of its function.

Arrhythmia—Irregular heart beat.

Electrocardiograph (ECG)—A test of a patient's heartbeat that involves placing leads, or detectors, on the patient's chest to record electrical impulses in the heart. The test will produce a strip, or picture record of the heart's electrical function.

Tachycardia—Rapid heart rate, defined as more than 100 beats per minute.

ORGANIZATIONS

American Heart Association. 7320 Greenville Ave. Dallas, TX 75231. (214) 373-6300. <<http://www.americanheart.org>>.

National Heart, Lung and Blood Institute. P.O. Box 30105, Bethesda, MD 20824-0105. (301) 251-1222. <<http://www.nhlbi.nih.gov>>.

Teresa Norris, RN

Women's health

Definition

Women's health is the effect of gender on disease and health that encompasses a broad range of biological and psychosocial issues.

Description

Women's health is the concept that examines gender differences in health and disease states. The average life expectancy has almost doubled for women (79 years for women and 73 years for men), when compared with averages during the turn of the century. Because of the gender gap in lifespan, women comprise approximately two thirds of the population older than 65 and three fourths of the population aged 85 years and older. Currently the fastest growing group in the United States is persons aged 85 years and older. Because of gender life expectancy differences, it is estimated that at the beginning of the twenty-first century, women will outnumber men in the 85 years and older category by 3:1. The reasons for this variance are primarily due to physiological differences among men and women.

During different phases of a women's life cycle there are complex interactions that exist between sex hormones, physiological changes, and emotional issues. Physiological changes occur as early as embryonic development when hormones program structural differences between male and female brains. During reproductive years, sex hormones profoundly influence reproduction and development, which creates a spectrum of gender specific health issues. With advancing age and onset of **menopause**, women's risk factors for disease is comparably similar to men's. Although the same disease may affect women as men, it is thought that biological mechanisms and psychosocial differences influence the clinical course of the disease (natural history) differently in women. The number of women working has doubled within the past 50 years. The effect of work **stress**, new environmental exposures and multiple roles is expected to have health and social impact.

The leading causes of **death** among women are cardiovascular disease, malignant **cancer**, cerebrovascular disease, chronic lung disease, pneumonia/influenza, and diabetes. Additionally, women can be prone to **osteoporosis**, alcohol abuse, psychological disorders, human **immunodeficiency** virus infection, and violence.

Heart Disease accounts for approximately a third of all deaths in women. About 250,000 women die annually of coronary heart disease or a one in three chance after age 40 years. The incidence of heart disease occurs about 10 years later in women than in men, since estrogens in premenopausal women has a protective effect. African American women are more prone to die from heart disease up to age 75. Beyond 75 years of age the propensity is reversed. Native American and Hispanic women have lower death rates from heart disease.

Malignant cancers are the most common cause of premature death among women. **Breast cancer** is the second leading cause of death in women and the most commonly diagnosed cancer. Lung cancer, secondary to cigarette **smoking** is the leading cause of cancer death among women.

Cerebrovascular disease, or stroke related deaths account for approximately 6% of all deaths in women and it is the third leading cause of mortality. The least common form of **stroke**, **subarachnoid hemorrhage**, is the more common cause in women.

The prevalence of cigarette smoking has increased greatly in women and this is correlated with pulmonary disease. Death rates for pulmonary disease including cancer and infectious causes of death are expected to rise for women.

Diabetes, a leading cause of death in women is more prevalent among Hispanic, African American, and Native

American women. Past age 45, diabetes affects about one in six women.

Women can also develop:

- osteoporosis, or loss of the quantity of bone, common in postmenopausal women who have estrogen changes.
- alcohol abuse, characterized by repeated usage of alcohol despite negative consequences. These women frequently do not seek treatment because of fear of consequences (i.e., loss of child custody). This disease can also have adverse affects on fertility and in the developing fetus if the mother continues to consume alcohol (fetal alcohol syndrome).
- psychological disorders, such as depression and eating disorders.
- acquired immunodeficiency syndrome (**AIDS**), which represents the highest percent increase in death rates.
- violence, a leading cause of death, primarily caused by a perpetrator who is or was a partner.

Causes and symptoms

Cardiovascular disease can be caused by blockage of a blood vessel, high blood pressure, or a secondary complication to another disease. There may be an abnormal heart rhythm or cell death. Patients may complain of a broad spectrum of symptoms that may include **pain** chest discomfort, high blood pressure, or strain during physical exertion.

When attempting to define the cause and symptoms of cancer, it is important to assess the type of cancer and location. Additionally, if the tumor is localized (benign) or has spread to other areas (malignant), is vital for treatment planning and overall prognosis. In cases of breast cancer there may be a lump discovered during self-examination or **mammography** (special breast x rays).

Cerebrovascular disease may cause **tremors** (shaking), loss of balance and coordination, or functional and sensation loss of some parts of the body. Patients may have sudden transient strokes that could result in temporary loss of consciousness and **amnesia** of the incident. Patients may also develop chronic neurological states that causing memory loss and behavioral changes (**Alzheimer's disease**).

Patients with pulmonary (lung) cancer may develop **shortness of breath**, **fatigue**, weight loss, worsening **cough**, and coughing up bright red blood with sputum. Lung infections such as **pneumonia** may present with high **fever**, weakness, difficulty breathing, and abnormal breathe sounds heard with a stethoscope during **physical examination**.

Diabetes is a syndrome with disordered metabolism and high blood sugar due to an abnormality in the chemical that regulates sugar levels. It is characterized by an increased thirst, urination, and chronic skin infections.

Osteoporosis may cause the bones to be brittle and weak. It is usually not detected until bones start to break.

The alcohol abuser will continue to drink despite negative repercussions. The person may not seek treatment to evade legal and/or child custody problems. The patient may hide alcohol, or confine drinking to specific times. The disease progresses to where there may be permanent liver damage, memory blackouts and **malnutrition**.

Depression may manifest a loss of interest and desire. Patients may have difficulty getting out of bed. They may lack motivation to work or tend to daily activities.

Patients with AIDS may not have symptoms for years. When active disease occurs, patients will typically develop recurrent infections that are the usual cause of death.

Domestic violence is usually associated with a perpetrator who is in a relationship with the affected person. Abuse can be manifested by physical violence and/or homicide.

Diagnosis

Diagnosis can be accomplished with a history, physical examination, and specialized tests or procedures. For cardiovascular disease an electrocardiogram can determine the activity of the heart. Additional tests may include **echocardiography** (ultrasonic waves that generate an image), stress testing, and studies that require placing a catheter with a probe to examine the damage to heart tissue. Special tests with dyes may also be injected to enhance visualization. Cancer may be detected using specialized test called tumor makers and imaging studies such as MRI and CAT scans. Cerebrovascular disease can be detected with a complete neurological examination and specialized imaging technology. Diabetes is usually detected by a careful history presence of risk factors (**obesity**) and blood analysis of glucose levels. Osteoporosis can be evaluated with specialized bone densitometry. Alcohol abuse can be established by a bio-psycho-social assessment and standardized tests which screen for this disorder. Psychological evaluation (such as the **Minnesota Multiphasic Personality Inventory**, MMPI) can usually detect depression or eating disorders. AIDS can be established by a careful history, belonging to high-risk groups and Western blot analysis (examination of blood to detect the protein of human immunodeficiency virus). Violence can be established by physical signs of beating, such as cuts and **bruises**.

Treatment

Treatment depends on the extent of disease and the present health status of the patient. Additionally, in some cases treatment may stop at sometime, or it may altogether be refused. Treatment for cardiovascular disease may include surgical intervention and/or conservative medical treatment with medications. Diet, **exercise**, and weight reduction are important parameters for treatment planning. Appropriate referrals, counseling, and follow up are usually indicated. Treatment for cancer may include a combination of surgery, **chemotherapy** or **radiation therapy**. These treatment modalities may be given singly or in combination or at different times during disease progression. Cerebrovascular disease can be treated surgically and/or with medications that thin the blood. Symptomatic care may be indicated in addition to close monitoring if the patient develops disability and/or cognitive impairment. Diabetes can be treated by dietary modifications and medications, which treat abnormal levels of blood glucose (sugar). Osteoporosis can be treated with estrogen replacement and regular vitamin/mineral intake. Alcohol abuse may require long-term therapy, inpatient treatment and medications. Community centered support group meeting are also recommended as a form of treatment maintenance. To date there is no treatment for AIDS, other than medications, that offer symptomatic relief. Alcohol abuse, psychological disorders and violence require therapy, possible medication, and community centered support group meetings.

Alternative treatment

There are numerous studies which support intake of coenzyme Q10 for cardiovascular health. Studies have shown that beta-carotene and vitamin E and C have no effect for cancer. Some studies indicate positive results for reproductive health using **acupuncture**. Some advocates proposed certain herbs may be beneficial during menopause. According to most medical literature, further research using scientific method is vital for general acceptance.

Prognosis

The prognosis depends on the extent of disease and the physical and emotional status of the patient. Prognosis is also related to tolerance of treatment, adverse drug effects, and complication during or after surgery, disease resurgence and patient compliance with treatment recommendations.

Prevention

One of the most reliable measures of prevention is education and training. The Council on Graduate Medical

KEY TERMS

Electrocardiogram—An instrument that monitors heart rate and rhythm.

Education has provided funding for numerous centers to research women health issues. On more individual level preventive and personal habits are vital for good health. Most physicians believe that a baseline physical examination is a reliable comparative tool. Women should receive counseling for special issues concerning cigarette smoking, exercise, diet, primary disease prevention, safe sexual practices, alcohol abuse, psychological disorders, and violence. Additionally, knowledge of family history is important since many diseases have a strong propensity among first-degree relatives. Blood pressure should normally be measured every other year. Screening tests for breast, cervical, and colorectal cancer is recommended. Pap smears taken during routine pelvic examinations can screen for disease processes in the reproductive tract. Serum cholesterol monitoring and reduction are advised. Patients may require postmenopausal estrogen replacement therapy and vitamin/mineral supplements.

Resources

BOOKS

- Duthie, Edmund H., et al, eds. *Practice of Geriatrics*. 3rd ed. W. B. Saunders Company, 1998.
 Ryan, Kenneth J., et al, eds. *Kistner's Gynecology & Women's Health*. 7th ed. Mosby, Inc., 1999.

PERIODICALS

- Lautenbach, G. L., and M. Petri. "Women's Health: General Medical Care of the Patient with Rheumatic Disease." *Rheumatic Diseases Clinics of North America* 25 (Aug. 1999).

ORGANIZATION

- U.S. Department of Health & Human Services. 200 Independence Ave SW, Washington DC 20201. (877) 696-6775. <<http://www.hhs.gov>>.

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Wound culture

Definition

A wound culture is a laboratory test in which microorganisms from a wound are grown in a special

growth medium. It is done to find and identify the microorganism causing an infection in a wound or an **abscess**. If a microorganism is found, more testing is done to determine the **antibiotics** that will be effective in treating the infection.

Purpose

Wounds are injuries to body tissues caused by disease processes or events such as **burns**, punctures, and human or animal bites. Wounds or abscesses also occur within body tissues as a result of surgery or dental procedures. Wounds become infected when microorganisms from the outside environment, or from within the person's body, enter the open wound and multiply. A wound that is red, painful, swollen, and draining pus is probably infected. A **fever** following surgery indicates an infection at the site of surgery.

To enable healing and prevent the spread of infection to other body tissues, the infecting microorganisms must be killed. A wound culture discovers which type of microorganism is causing the infection and the best antibiotic with which to kill it.

Description

A sample of material, such as pus or a portion of tissue, is taken from the wound, placed in a sterile container, and sent to the laboratory. In the laboratory, this material is spread over the surface of several different types of culture plates and placed in an incubator at body temperature for one to two days.

A Gram stain is done by staining the slide with purple and red stains, then examining it under a microscope. If many white blood cells and bacteria are seen, it is an early confirmation of infection. The color of stain retained by the bacteria (purple or red), their shape (such as round or rectangular), and their size provide valuable clues as to their identity, and help the physician predict which antibiotics might work best even before the entire test is completed. Bacteria that stain purple are called gram-positive; those that stain red are called gram-negative.

Bacteria can be grouped into two categories: aerobes and anaerobes. Aerobes are bacteria that need oxygen to live; anaerobes live only where there is no oxygen. Deep wounds, closed-off from oxygen, are an ideal environment for an anaerobic infection to develop. Foul-smelling odor, gas, or **gangrene** at the infection site are signs of an infection caused by an anaerobic bacteria. Routine cultures typically only look for aerobic bacteria. If the physician tells the laboratory to include a culture for anaerobes, a portion of the wound sample will be put

on culture plates, or in a tube of culture broth, and incubated in a special chamber without oxygen.

Bacteria present in the wound sample will multiply and appear as visible colonies on the plates, or as cloudiness in the tube of broth. They are identified by the appearance of their colonies, the results of biochemical tests, and information from Gram staining part of the bacterial colony.

A sensitivity test, also called an antibiotic susceptibility test, is also done. The bacteria are tested against different antibiotics to determine which will treat the infection by killing the bacteria.

If the physician thinks the wound may be infected with a mold or yeast, a fungal culture is also done. The wound sample is spread on special culture plates that are treated to encourage the growth of mold and yeast. Different biochemical tests and stains are used to identify molds and yeast.

Other more unusual microorganisms, such as *Mycobacterium leprae*, may be the cause of a wound infection. The physician must notify the laboratory to culture specifically for these more unusual microorganisms.

The initial Gram stain result is available the same day, or in less than an hour if requested by the physician. An early report, known as a preliminary report, is usually available after one day. This report will tell if any microorganisms have yet been found, and, if so, their Gram stain appearance. For example, they may have the appearance of a gram-negative rod, or a gram-positive cocci (spherical shape). The final report, usually available in one to three days, includes complete identification, an estimate of the quantity of the microorganisms, plus a list of the antibiotics to which they are sensitive. Cultures for fungi and anaerobic bacteria may take two to three weeks.

Wound culture is also called soft tissue culture, abscess culture, or wound culture and sensitivity.

Preparation

A piece of the infected tissue is the best specimen. If this is not possible, the next best specimen is pus from the wound. Because many microorganisms normally live on skin and mucous membrane, the specimen must not be allowed to touch the area surrounding the wound.

The physician first cleans the surface of the wound using alcohol. Using a syringe, the physician suctions out (aspirates) as much pus as possible from the wound. Next, this is sent to the laboratory in a sterile container. If it is impossible to aspirate the pus, pus from within the wound can be collected on a swab.

KEY TERMS

Aerobe—Bacteria that require oxygen to live.

Anaerobe—Bacteria that live only where there is no oxygen.

Normal flora—The mixture of bacteria normally found at specific body sites.

The physician may choose to start the person on an antibiotic before the culture and sensitivity tests are completed. However, the specimen for culture should be collected before antibiotics are begun. Antibiotics in the person's system may prevent microorganisms present in the wound from growing in culture, and thus not be identifiable.

Normal results

A normal culture may be contaminated by a mixture of microorganisms normally found on a person's skin (normal flora).

It is not uncommon for the microorganism causing a wound infection to not grow in culture. This is particularly true if the specimen was collected with a swab rather than an aspirate or tissue biopsy.

Abnormal results

Streptococcus Group A, *Escherichia coli*, *Proteus*, *Klebsiella*, *Pseudomonas*, *Enterobacter*, *Enterococci*, *Staphylococcus aureus*, *Bacteroides*, and *Clostridium*, are common causes of wound infections. More than one microorganism may be the cause of the infection.

Resources

BOOKS

Isada, Carlos M., et al. *Infectious Diseases Handbook*. Hudson, OH: Lexi-Comp Inc., 1995.

Koneman, Elmer W., et al. *Color Atlas and Textbook of Diagnostic Microbiology*. 4th ed. Philadelphia: J. B. Lippincott Co., 1992.

Pagana, Kathleen Deska. *Mosby's Manual of Diagnostic and Laboratory Tests*. St. Louis: Mosby, Inc., 1998.

Shulman, Standford T., et al., eds. *The Biologic and Clinical Basis of Infectious Diseases*. 5th ed. Philadelphia: W. B. Saunders Co., 1997.

PERIODICALS

Robson, Martin C. "Wound Infection. A Failure of Wound Healing Caused by an Imbalance of Bacteria." *Surgical Clinics of North America* (June 1997): 637-650.

ORGANIZATIONS

The Wound Healing Society. 1550 South Coast Highway, Suite 201, Laguna Beach, CA 92651. (888) 434-4234. <<http://wizard.pharm.wayne.edu/woundsoc/WHS.HTM>>.

Nancy J. Nordenson

KEY TERMS

Antiseptic—Chemicals applied to the skin to destroy bacteria and prevent infection.

Wound flushing

Definition

Wound flushing is a method of cleaning a wound by applying pressurized water or antiseptic solutions to the tissues.

Purpose

Wound flushing is used to help flush debris from a wound, lessening the risk of infection or treating an infection that already exists. If the wound is flushed with an antiseptic, it is more likely to heal correctly; flushing the wound can help prevent the surface from healing over a possibly infected area underneath.

Description

Wound flushing is usually done in a hospital, though if it is performed at home, there is less chance of infection because of the higher risk of bacterial contamination in the hospital environment. Wound flushing is especially helpful in treating people with bites, lacerations, or crush injuries, which often become infected due to the presence of dead tissue and foreign debris, such as splinters or dirt. In a non-surgical situation, the procedure is usually performed by a nurse. An acute injury, such as a crushing wound or knife cut, the wound is flushed right before the injury is stitched closed. For people with chronic **wounds**, such as bed sores or abscesses, the wound may be flushed periodically to treat or prevent infection. During an operation, a surgeon uses an antibacterial solution to flush the surgical site just before stitching the wound closed. After surgery, the wounds may be flushed to treat or prevent infection.

Preparation

The nurse or doctor may inject the site with a local anesthetic before flushing the wound.

Aftercare

After the wound is flushed, the health care provider cleans the area around the wound to guard against infec-

tion. Packing to absorb excess fluids may be placed into the wound, followed by a sterile bandage.

Risks

Complications rarely occur, especially if the solution used to flush the wound is chosen carefully so as to avoid skin irritation. Patients should call the doctor immediately if there is any sign of infection, such as **fever**, pus, or swelling.

Normal results

The wound will heal correctly, from the inside out, without infection.

Resources

BOOKS

Smeltzer, Suzanne C., and Brenda Bare. *Brunner and Suddarth's Textbook of Medical/Surgical Nursing*. Philadelphia: J. B. Lippincott Co., 1992.

Wounds

Definition

A wound occurs when the integrity of any tissue is compromised (e.g. skin breaks, muscle tears, **burns**, or bone **fractures**). A wound may be caused by an act, such as a gunshot, fall, or surgical procedure; by an infectious disease; or by an underlying condition.

Description

Types and causes of wounds are wide ranging, and health care professionals have several different ways of classifying them. They may be chronic, such as the skin ulcers caused by **diabetes mellitus**, or acute, such as a gunshot wound or animal bite. Wounds may also be referred to as open, in which the skin has been compromised and underlying tissues are exposed, or closed, in which the skin has not been compromised, but trauma to underlying structures has occurred (e.g. a bruised rib or

cerebral contusion). Emergency personnel and first-aid workers generally place acute wounds in one of eight categories:

- Abrasions. Also called scrapes, they occur when the skin is rubbed away by friction against another rough surface (e.g. rope burns and skinned knees).
- Avulsions. Occur when an entire structure or part of it is forcibly pulled away, such as the loss of a permanent tooth or an ear lobe. Explosions, gunshots, and animal bites may cause avulsions.
- Contusions. Also called **bruises**, these are the result of a forceful trauma that injures an internal structure without breaking the skin. Blows to the chest, abdomen, or head with a blunt instrument (e.g. a football or a fist) can cause contusions.
- Crush wounds. Occur when a heavy object falls onto a person, splitting the skin and shattering or tearing underlying structures.
- Cuts. Slicing wounds made with a sharp instrument, leaving even edges. They may be as minimal as a paper cut or as significant as a surgical incision.
- Lacerations. Also called tears, these are separating wounds that produce ragged edges. They are produced by a tremendous force against the body, either from an internal source as in **childbirth**, or from an external source like a punch.
- Missile wounds. Also called velocity wounds, they are caused by an object entering the body at a high speed, typically a bullet.
- Punctures. Deep, narrow wounds produced by sharp objects such as nails, knives, and broken glass.

Causes and symptoms

Acute wounds have a wide range of causes. Often, they are the unintentional results of motor vehicle accidents, falls, mishandling of sharp objects, or sports-related injury. Wounds may also be an intentional result of violence involving assault with weapons, including fists, knives, or guns.

The general symptoms of a wound are localized **pain** and bleeding. Specific symptoms include:

- An abrasion usually appears as lines of scraped skin with tiny spots of bleeding.
- An avulsion has heavy, rapid bleeding and a noticeable absence of tissue.
- A contusion may appear as a bruise beneath the skin or may appear only on imaging tests; an internal wound may also generate symptoms such as weakness, perspiration, and pain.



A close-up of a hard-contact gunshot wound with accompanying burn marks on the left and right sides of the wound.
(Custom Medical Stock Photo. Reproduced by permission.)

- A crush wound may have irregular margins like a laceration; however, the wound will be deeper and trauma to muscle and bone may be apparent.
- A cut may have little or profuse bleeding depending on its depth and length; its even edges readily line up.
- A laceration too may have little or profuse bleeding; the tissue damage is generally greater and the wound's ragged edges do not readily line up.
- A missile entry wound may be accompanied by an exit wound, and bleeding may be profuse, depending on the nature of the injury.
- A puncture wound will be greater than its length, therefore there is usually little bleeding around the outside of the wound and more bleeding inside, causing discoloration.

Diagnosis

A diagnosis is made by visual examination and may be confirmed by a report of the causal events. Medical personnel will also assess the extent of the wound and what effect it has had on the patient's well being (e.g. profound blood loss, damage to the nervous system or skeletal system).

Treatment

Treatment of wounds involves stopping any bleeding, then cleaning and dressing the wound to prevent infection. Additional medical attention may be required if the effects of the wound have compromised the body's ability to function effectively.

Stopping the bleeding

Most bleeding may be stopped by direct pressure. Direct pressure is applied by placing a clean cloth or



A defensive hand wound from a knife attack. (Photograph by D. Willoughby, Custom Medical Stock Photo. Reproduced by permission.)

dressing over the wound and pressing the palm of the hand over the entire area. This limits local bleeding without disrupting a significant portion of the circulation. The cloth absorbs blood and allows clot formation; the clot should not be disturbed, so if blood soaks through the cloth, another cloth should be placed directly on top rather than replacing the original cloth.

If the wound is on an arm or leg that does not appear to have a broken bone, the wound should be elevated to a height above the person's heart while direct pressure is applied. Elevating the wound allows gravity to slow down the flow of blood to that area.

If severe bleeding cannot be stopped by direct pressure or with elevation, the next step is to apply pressure to the major artery supplying blood to the area of the wound. In the arm, pressure would be applied to the brachial artery by pressing the inside of the upper arm against the bone. In the leg, pressure would be applied to the femoral artery by pressing on the inner crease of the groin against the pelvic bone.

If the bleeding from an arm or leg is so extreme as to be life-threatening and if it cannot be stopped by any other means, a tourniquet may be required. However, in the process of limiting further blood loss, the tourniquet also drastically deprives the limb tissues of oxygen. As a result, the patient may live but the limb may die.

Dressing the wound

Once the bleeding has been stopped, cleaning and dressing the wound is important for preventing infection. Although the flowing blood flushes debris from the wound, running water should also be used to rinse away dirt. Embedded particles such as wood slivers and glass splinters, if not too deep, may be removed with a needle or pair of tweezers that has been sterilized in rubbing

KEY TERMS

Abrasion—Also called a scrape. The rubbing away of the skin surface by friction against another rough surface.

Avulsion—The forcible separation of a piece from the entire structure.

Butterfly bandage—A narrow strip of adhesive with wider flaring ends (shaped like butterfly wings) used to hold the edges of a wound together while it heals.

Cut—Separation of skin or other tissue made by a sharp edge, producing regular edges.

Laceration—Also called a tear. Separation of skin or other tissue by a tremendous force, producing irregular edges.

Plasma—The straw-colored fluid component of blood, without the other blood cells.

Puncture—An injury caused by a sharp, narrow object deeply penetrating the skin.

Tourniquet—A device used to control bleeding, consisting of a constricting band applied tightly around a limb above the wound. It should only be used if the bleeding is life-threatening and can not be controlled by other means.

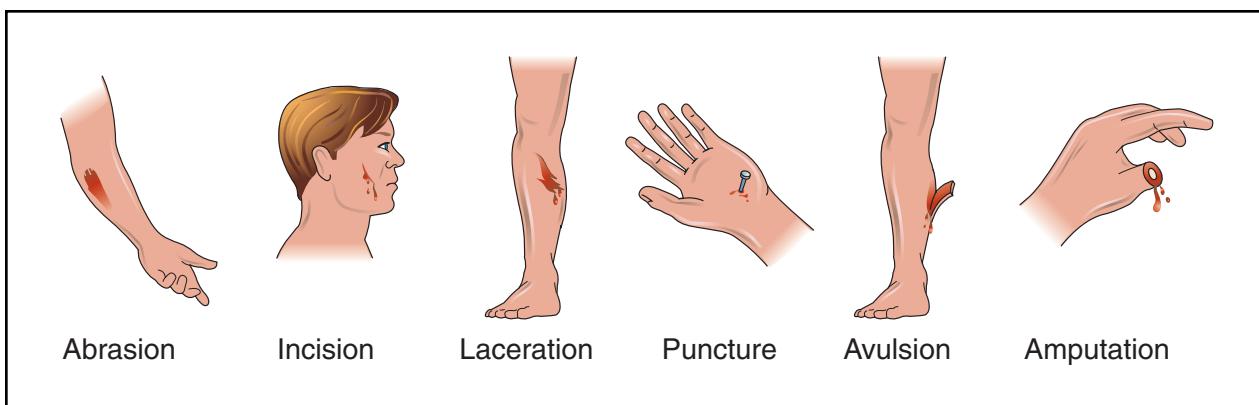
Traumatic shock—A condition of depressed body functions as a reaction to injury with loss of body fluids or lack of oxygen. Signs of traumatic shock include weak and rapid pulse, shallow and rapid breathing, and pale, cool, clammy skin.

Whole blood—Blood which contains red blood cells, white blood cells, and platelets in plasma.

alcohol or in the heat of a flame. Once the wound has been cleared of foreign material and washed, it should be gently blotted dry, with care not to disturb the blood clot. An antibiotic ointment may be applied. The wound should then be covered with a clean dressing and bandaged to hold the dressing in place.

Getting medical assistance

A person who has become impaled on a fixed object, such as a fence post or a stake in the ground, should only be moved by emergency medical personnel. **Foreign objects** embedded in the eye should only be removed by a doctor. Larger penetrating objects, such as a fishhook or an arrow, should only be removed by a doctor to prevent further damage as they exit.



Examples of open wounds. (Illustration by Electronic Illustrators Group.)

Additional medical attention is necessary in several instances. Wounds which penetrate the muscle beneath the skin should be cleaned and treated by a doctor. Such a wound may require stitches to keep it closed during healing. Some deep wounds which do not extend to the underlying muscle may only require butterfly bandages to keep them closed during healing. Wounds to the face and neck, even small ones, should always be examined and treated by a doctor to preserve sensory function and minimize scarring. Deep wounds to the hands and wrists should be examined for nerve and tendon damage. Puncture wounds may require a **tetanus** shot to prevent serious infection. Animal bites should always be examined and the possibility of **rabies** infection determined.

Infection

Wounds which develop signs of infection should also be brought to a doctor's attention. Signs of infection are swelling, redness, tenderness, throbbing pain, localized warmth, **fever**, swollen lymph glands, the presence of pus either in the wound or draining from it, and red streaks spreading away from the wound.

Emergency treatment

With even as little as one quart of blood lost, a person may lose consciousness and go into traumatic **shock**. Because this is life-threatening, emergency medical assistance should be called immediately. If the person stops breathing, artificial respiration (also called mouth-to-mouth resuscitation or rescue breathing) should be administered. In the absence of a pulse, **cardiopulmonary resuscitation (CPR)** must be performed. Once the person is breathing unassisted, the bleeding may be attended to.

In cases of severe blood loss, medical treatment may include the intravenous replacement of body fluids. This

may be infusion with saline or plasma, or a **transfusion** of whole blood.

Alternative treatment

In addition to the conventional treatments described above, there are alternative therapies that may help support the injured person. **Homeopathy** can be very effective in acute wound situations. *Ledum (Ledum palustre)* is recommended for puncture wounds (taken internally). *Calendula (Calendula officinalis)* is the primary homeopathic remedy for wounds. An antiseptic, it is used topically as a succus (juice), tea, or salve. Another naturally occurring antiseptic is tea tree oil (*Melaleuca spp.*), which can be mixed with water for cleaning wounds. *Aloe (Aloe barbadensis)* can be applied topically to soothe skin during healing. When wounds affect the nerves, especially in the arms and legs, St.-John's-wort (*Hypericum perforatum*) can be helpful when taken internally or applied topically. **Acupuncture** can help support the healing process by restoring the energy flow in the meridians that have been affected by the wound. In some cases, vitamin E taken orally or applied topically can speed healing and prevent scarring.

Prognosis

Without the complication of infection, most wounds heal well with time. Depending on the depth and size of the wound, it may or may not leave a visible scar.

Prevention

Most actions that result in wounds are preventable. Injuries from motor vehicle accidents may be reduced by wearing seat belts and placing children in size-appropriate car seats in the back seat. Sharp, jagged, or pointed objects or machinery parts should be used according to

the manufacturer's instructions and only for their intended purpose. Firearms and explosives should be used only by adults with explicit training; they should also be kept locked and away from children. Persons engaging in sports, games, and recreational activities should wear all proper protective equipment and follow safety rules.

Resources

BOOKS

American Red Cross Staff. *Standard First Aid*. St. Louis: Mosby Yearbook, 1992.

The Editors of Time-Life Books. *The Medical Advisor: The Complete Guide to Alternative and Conventional Treatments*. Alexandria, VA: Time Life, Inc., 1996.

ORGANIZATIONS

American Red Cross. P.O. Box 37243, Washington, D.C. 20013. <<http://www.redcross.org>>.

Bethany Thivierge
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Wryneck see **Torticollis**

X

X-linked agammaglobulinemia

Definition

X-linked agammaglobulinemia (XLA) or Bruton's agammaglobulinemia is present at birth (congenital) and is characterized by low or completely absent levels of immunoglobulins in the bloodstream. Immunoglobulins are protein molecules in blood serum that function like antibodies. Without them, the body lacks a fully functioning immune system. Persons with XLA are vulnerable to repeated, potentially fatal bacterial infections.

Description

XLA occurs in one in 50,000 to one in 100,000 newborns. Almost all persons with the disorder are males. Although persons with XLA carry the genes to produce immunoglobulins, a genetic defect on the X chromosome prevents their formation. This defect is not associated with the immunoglobulins themselves, but rather with the B cells in the bloodstream that ordinarily secrete the immunoglobulins.

B cells are a type of white blood cell. They are the sole producers of immunoglobulins in the body. B cells are produced in the bone marrow and carried to the spleen, lymph nodes, and other organs as they mature. The maturation process depends on an enzyme called Bruton's agammaglobulinemia tyrosine kinase (Btk). If Btk is missing or defective, the B cells cannot mature and cannot produce immunoglobulins.

The gene for Btk is on the X chromosome. Certain changes (mutations) in this gene result in defective Btk. Since the gene is carried on the X chromosome, XLA individuals are almost always male. Females have two X chromosomes, which means they have two copies of the Btk gene, one of which is normal. Males have only one X chromosome.

Causes and symptoms

XLA is caused by a defect in the gene that codes for Btk. This defect leads to blocked maturation of B cells, the cells that produce immunoglobulins. Because other portions of the immune system are functional, people with XLA can fight off some types of infection, such as fungal and most viral infections. Immunoglobulins, however, are vital to combat bacterial infections. Infants with XLA usually do not show symptoms during the first six months of life because immunoglobulins from their mothers are circulating in their bloodstreams. As the mother's supply decreases, the baby becomes increasingly vulnerable to bacterial infections.

Common symptoms of immunoglobulin deficiency appear after the infant is six months old. They include frequent ear and sinus infections, **pneumonia**, and **gastroenteritis**. Certain viruses, such as hepatitis and **polio** viruses, can also pose a threat. Children with XLA grow slowly, have small tonsils and lymph nodes, and may develop chronic skin infections. Approximately 20% of these children develop arthritis, possibly as a result of joint infections.

Diagnosis

Frequent bacterial infections, a lack of mature B cells, and low-to-nonexistent levels of immunoglobulins point to a diagnosis of XLA. A sample of the infant's blood serum can be analyzed for the presence of immunoglobulins by a technique called **immunoelctrophoresis**. To make a definitive diagnosis, the child's X chromosome is analyzed for defects in the Btk gene. Similar analysis can be used for prenatal diagnosis or to detect carriers of the defective gene.

Treatment

Treatment of XLA consists of regular intravenous doses of commercially prepared gamma globulin (sold under the trade names Gammagard or Gammagard) to

KEY TERMS

Antibody—A molecule that is produced by the immune system in response to a protein, called an antigen, that is not recognized as belonging in the body.

B cell—A type of lymphocyte, or white blood cell, that is a key component of the body's immune system. Mature B cells produce immunoglobulins.

Bruton's agammaglobulinemia tyrosine kinase (Btk)—An enzyme vital for the maturation of B cells.

Carrier—A person who has a genetic defect but does not develop any symptoms or signs of the defect. The carrier's offspring may inherit the defect and develop the associated disorder.

Enzyme—A protein molecule that prompts rapid biochemical reactions.

Immunoglobulin—A protein molecule formed by mature B cells in response to foreign proteins in the body. There are five types of immunoglobulins, but the major one is gamma globulin or immunoglobulin G.

Mutation—A change in a gene that alters the function or other characteristics of the gene's product.

X chromosome—One of the two sex chromosomes (the other is Y) that determine a person's gender. Normal males have both an X and a Y chromosome, and normal females have two X chromosomes.

ward off infections. **Antibiotics** are used to treat infections as they occur. Children with XLA must be treated promptly for even minor cuts and scrapes, and taught to avoid crowds and people with active infections.

Prognosis

Prior to the era of gamma globulin and antibiotic treatment, approximately 90% of XLA individuals died before age 8. Early diagnosis and current therapy allows most individuals with XLA to reach adulthood and lead relatively normal lives. Infants who develop polio or persistent viral infections, however, have a poorer prognosis.

Prevention

Parents of a child with XLA should consider **genetic counseling** if they are planning to have more children.

Resources

BOOKS

Barrett, Douglas J., et al. "Antibody Deficiency Diseases." In *The Metabolic and Molecular Bases of Inherited Disease*. 7th ed. Ed. Charles R. Scriver, et al. New York: McGraw-Hill, Inc., 1995.

Physicians' Guide to Rare Diseases. Ed. Jess G. Thoene. Montvale, NJ: Dowden Publishing Co., Inc., 1995.

"X-Linked Infantile Hypogammaglobulinemia." In *Professional Guide to Diseases*, ed. Stanley Loeb, et al. Springhouse, PA: Springhouse Corporation, 1991.

PERIODICALS

Ochs, Hans D., and C. I. Edvard Smith. "X-Linked Agammaglobulinemia: A Clinical and Molecular Analysis." *Medicine* 75 (1996): 287.

Sideras, Paschal, and C. I. Edvard Smith. "Molecular and Cellular Aspects of X-Linked Agammaglobulinemia." *Advances in Immunology* 59 (1995): 135.

ORGANIZATIONS

Immune Deficiency Foundation. 25 W. Chesapeake Ave., Suite 206, Towson, MD 21204. (800) 296-4433. <<http://www.primaryimmune.org>>.

National Organization for Rare Disorders. P.O. Box 8923, New Fairfield, CT 06812-8923. (800) 999-6673. <<http://www.rarediseases.org>>.

Julia Barrett

X rays of the eye's orbit see **X rays of the orbit**

X rays of the orbit

Definition

Orbital x rays are studies of the area and structures containing the eye. The orbit is the circle of thin bones that houses and protects the eye, even extending behind the eye and nearly wrapping around it. The orbit includes the eyebrow, the bridge of the nose and the cheekbone. X rays are a form of radiation (like light) that can penetrate body tissues.

Purpose

Orbital x ray, or orbital radiography, is often used to detect problems resulting from injury or trauma to the eye. The exam may also detect changes to the structure of the eye, which may indicate various diseases. An ophthalmologist may also order an orbital x ray if there is concern that foreign bodies may be present in the eye that cannot be detected with an instrument called an ophthalmoscope.

Precautions

Pregnant women and women who could possibly be pregnant should only receive orbital x rays when absolutely necessary. If the patient is in severe **pain** due to injury or trauma, a painkiller may be given to help ease discomfort during positioning of the head throughout the exam. No other precautions are necessary for orbital x rays.

Description

Each orbit is composed of a floor, a roof, a medial (in the center plane) and lateral (sides of the plane) walls. The orbital x ray involves several different views in order for the physician to clearly see various parts of the eye without obstruction. In orbital x rays, images of the unaffected eye may also be taken to compare its shapes and structures to those of the affected eye. Views may include side view (lateral), back to front (posteroanterior), base view, views from both sides, and an image from the center to one outside edge (half-axial projection). Projections of the optical canal will also be included. For all of these views, the patient may be seated upright or asked to lie on a table in the x ray room.

The orbital x ray procedure should take about 15 minutes to complete. Following the procedure, the patient will usually be asked to wait until the films are developed to ensure they are high enough quality and that repeat x rays are not necessary. A physician may perform the x ray exam in his or her office, or refer the patient to an outpatient radiology facility or hospital radiology department. In the case of emergency, the exam may be performed in the emergency room or a nearby radiology area of the hospital.

Preparation

There are no special dietary preparations needed prior to an orbital x ray. As with any radiography procedure, the patient should remove any jewelry or metal objects, which may interfere with a clear image.

Aftercare

No aftercare is required following this diagnostic test.

Risks

Radiation exposure is low for this procedure and all certified radiology facilities follow strict personnel and equipment guidelines for radiation protection. Women of child bearing age and children should be offered protective shielding (lead aprons) to cover the genital and/or abdominal areas.

KEY TERMS

Blowout fracture—A fracture or break in the orbit that is caused by sudden and violent impact to the area.

Malignancy—A malignancy is a tumor that is cancerous and growing.

Medial wall—The middle bone, or wall of the eye's orbit. It is generally thicker than the roof and floor walls.

Ophthalmologist—A physician who specializes in the workings, structures and care of the eyes.

Ophthalmoscope—An instrument routinely used by ophthalmologists to examine the interior of the eye. It consists of a small light, a mirror, and lenses of differing powers that magnify.

Radiography—Examination of any part of the body through the use of x rays. The process produces an image of shadows and contrasts on film.

X ray—A form of electromagnetic radiation with shorter wavelengths than normal light. X rays can penetrate most structures.

Normal results

Normal findings will show the bones of the orbit intact, and will show similarity between the orbit that is being studied and the unaffected orbit.

Abnormal results

Positive findings from an orbital x ray may show that there has been injury to the eye. Certain signs may indicate some disease that is affecting the orbital structures. Tiny **fractures** in the orbital bones can usually be detected on the radiograph. The floor bone, the medial wall and the ethmoid bone, which is a spongy bone that forms the upper part of the nasal cavity, are the most likely to break. In a blowout fracture (one involving the orbital floor), radiographic findings may include disruption to the orbital floor, an opaque look to the sinuses on the same side as the affected orbit (due to hemorrhage) or signs of sinus problems from the orbital root's interference. These indications can be seen in most typical orbital x ray views.

Since the physician examines both orbits side by side, indications of differences in size and shape of the various structures in the orbit may be apparent. The orbit may be enlarged, indicating irritation from an injury or

foreign body. A number of growing tumors within the eye or brain area may also cause orbital enlargement. Destruction of the walls of the orbit may indicate a nearby infection or malignancy. Changes in density of the tiny orbit bones may also be a sign of bone disease or cancer spread to bone.

Children's orbits are more likely to be enlarged by a fast growing lesion, since their orbital bones have not fully developed.

Resources

BOOKS

Illustrated Guide to Diagnostic Tests. Ed. J. A. Lewis. Springhouse, PA: Springhouse Corp. 1994.

ORGANIZATIONS

American Academy of Ophthalmology. 655 Beach Street, P.O. Box 7424, San Francisco, CA 94120-7424. <<http://www.eyenet.org>>.

National Eye Institute. 2020 Vision Place, Bethesda, MD 20892-3655. (301) 496-5248. <<http://www.nei.nih.gov>>. American Academy of Ophthalmology. 655 Beach Street, P.O. Box 7424, San Francisco, CA 94120-7424. <<http://www.eyenet.org>>.

OTHER

Segeue Eye Institute. University of Pennsylvania Health System <<http://www.med.upenn.edu/ophth>>.

Teresa Norris, RN

Xerophthalmia see **Vitamin A deficiency**

Xerostomia see **Dry mouth**

XLA see **X-linked agammaglobulinemia**

Y

Yaws

Definition

Yaws is a chronic illness which first affects the skin, and then affects the bones.

Description

Yaws tends to strike children, particularly between the ages of two and five. It is common in areas where poverty and overcrowding interfere with good hygiene practices. The most common locations are in rural areas throughout Africa, Southeast Asia, and in locations bordering the equator in the Americas.

Causes and symptoms

Yaws is caused by a spiral-shaped bacterium (spirochete) called *Treponema pertenue*. This bacterium belongs to the same family as the bacterium that causes *syphilis*.

Yaws is passed among people by direct skin contact. It requires some kind of a scratched or insect bitten area in order for the bacteria to actually settle in and cause infection. An injured spot on the leg is the most common part of the body through which the bacteria enter. Young children, who are constantly bumping themselves in play, who wear little clothing, who do not wash their hands often, and who may frequently put their hands in their mouths, are particularly susceptible.

The first symptom of yaws occurs three to four weeks after acquiring the bacteria. The area where the bacteria originally entered the skin becomes a noticeable bump (papule). The papule grows larger and develops a punched-out center (ulcer), covered with a yellow crust. Lymph nodes in the area may become swollen and tender. This first papule may take as long as six months to heal. Secondary soft, gummy growths then appear on the face, arms and legs, and buttocks. These soft, tumor-like masses may grow on the soles of the feet, causing the

patient to walk in an odd and characteristic fashion on the sides of his or her feet (nicknamed "crab yaws"). More destructive tumors may then disrupt the bones of the face, the jaw, and the lower leg. Ulcers around the nose and on the face may be very mutilating.

Diagnosis

Samples taken from the first papules may be examined using a technique called dark-field microscopy. This often allows the spirochetes to be identified. They may also be identified in fluid withdrawn from swollen lymph nodes. Various tests can also be run on blood samples to determine if an individual is producing antibodies (special immune cells) which are specifically made in response to the presence of these spirochetes.

Treatment

A single penicillin injection in a muscle is sufficient to completely end the disease.

Prognosis

Without treatment, yaws is a terribly disfiguring chronic illness. With appropriate treatment, the progression of the disease can be completely halted.

Prevention

For a time, the World Health Organization (WHO) was working to totally eradicate yaws, just as smallpox was successfully eradicated. This has not occurred, however. WHO continues to work to identify and respond to outbreaks quickly, in an effort to at least slow the spread of yaws.

Resources

BOOKS

Perine, Peter L. "Endemic Treponematoses." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

KEY TERMS

Papule—A raised bump on the skin.

Ulcer—A punched-out, irritated pit on the skin.

Sherris, John C., and James J. Plorde. "Spirochetes." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Yellow fever

Definition

Yellow fever is a severe infectious disease, caused by a virus called a "flavivirus." This flavivirus can cause outbreaks of epidemic proportions throughout Africa and tropical America. The first written evidence of such an epidemic occurred in the Yucatan in 1648. Since that time, much has been learned about the interesting transmission patterns of this devastating illness.

Description

In order to understand how yellow fever is passed, several terms need to be defined. The word "host" refers to an animal that can be infected with a particular disease. The term "vector" refers to an organism which can carry a particular disease-causing agent (such as a virus or bacteria) without actually developing the disease. The vector can then pass the virus or bacteria on to a new host.

Many of the common illnesses in the United States (including the **common cold**, many viral causes of **diarrhea**, and **influenza** or "flu") are spread via direct passage of the causative virus between human beings. Yellow fever, however, cannot be passed directly from one infected human being to another. Instead, the virus responsible for yellow fever requires an intermediate vector, a mosquito, which carries the virus from one host to another.

The hosts of yellow fever include both humans and monkeys. The cycle of yellow fever transmission occurs as follows: an infected monkey is bitten by a tree-hole

breeding mosquito. This mosquito acquires the virus, and can pass the virus on to any number of other monkeys that it may bite. When a human is bitten by such a mosquito, the human may acquire the virus. In the case of South American yellow fever, the infected human may return to the city, where an urban mosquito (*Aedes aegypti*) serves as a viral vector, spreading the infection rapidly by biting humans.

Symptoms

Once a mosquito has passed the yellow fever virus to a human, the chance of disease developing is about 5–20%. Infection may be fought off by the host's immune system, or may be so mild that it is never identified.

In human hosts who develop the disease yellow fever, there are five distinct stages through which the infection evolves. These have been termed the periods of incubation, invasion, remission, intoxication, and convalescence.

Yellow fever's incubation period (the amount of time between the introduction of the virus into the host and the development of symptoms) is three to six days. During this time, there are generally no symptoms identifiable to the host.

The period of invasion lasts two to five days, and begins with an abrupt onset of symptoms, including fever and chills, intense **headache** and lower backache, muscle aches, nausea, and extreme exhaustion. The patient's tongue shows a characteristic white, furry coating in the center, surrounded by a swollen, reddened margin. While most other infections that cause a high fever also cause an increased heart rate, yellow fever results in an unusual finding, called Faget's sign. This is the simultaneous occurrence of a high fever with a slowed heart rate. Throughout the period of invasion, there are still live viruses circulating in the patient's blood stream. Therefore, a mosquito can bite the ill patient, acquire the virus, and continue passing it on to others.

The next phase is called the period of remission. The fever falls, and symptoms decrease in severity for several hours to several days. In some patients, this signals the end of the disease; in other patients, this proves only to be the calm before the storm.

The period of intoxication represents the most severe and potentially fatal phase of the illness. During this time, lasting three to nine days, a type of degeneration of the internal organs (specifically the kidneys, liver, and heart) occurs. This fatty degeneration results in what is considered the classic triad of yellow fever symptoms: **jaundice**, black vomit, and the dumping of protein into the urine. Jaundice causes the whites of the patient's eyes

and the patient's skin to take on a distinctive yellow color. This is due to liver damage, and the accumulation of a substance called bilirubin, which is normally processed by a healthy liver. The liver damage also results in a tendency toward bleeding; the patient's vomit appears black due to the presence of blood. Protein, which is normally kept out of the urine by healthy, intact kidneys, appears in the urine due to disruption of the kidney's healthy functioning.

Patients who survive the period of intoxication enter into a relatively short period of convalescence. They recover with no long term effects related to the yellow fever infection. Further, infection with the yellow fever virus results in lifelong immunity against repeated infection with the virus.

Diagnosis

Diagnosis of yellow fever depends on the examination of blood by various techniques in order to demonstrate either yellow fever viral antigens (the part of the virus that stimulates the patient's immune system to respond) or specific antibodies (specific cells produced by the patient's immune system which are directed against the yellow fever virus). The diagnosis can be strongly suspected when Faget's sign is present. When the classic triad of symptoms is noted yellow fever is strongly suspected.

Treatment

There are no current anti-viral treatments available to combat the yellow fever virus. The only treatment of yellow fever involves attempts to relieve its symptoms. Fevers and pain should be relieved with acetaminophen, not aspirin or ibuprofen, both of which could increase the already-present risk of bleeding. Dehydration (due to fluid loss both from fever and bleeding) needs to be carefully avoided. This can be accomplished by increasing fluids. The risk of bleeding into the stomach can be decreased through the administration of antacids and other medications. Hemorrhage may require blood transfusions. Kidney failure may require dialysis (a process that allows the work of the kidneys in clearing the blood of potentially toxic substances to be taken over by a machine, outside of the body).

Prognosis

Five to ten percent of all diagnosed cases of yellow fever are fatal. Jaundice occurring during a yellow fever infection is an extremely grave predictor. Twenty to fifty percent of these patients die of the infection. Death may occur due to massive bleeding (hemorrhage), often following a lapse into a comatose state.

KEY TERMS

Epidemic—A situation in which a particular disease spreads rapidly through a population of people in a relatively short period of time.

Faget's sign—The simultaneous occurrence of a high fever with a slowed heart rate.

Host—The organism (such as a monkey or human) in which another organism (such as a virus or bacteria) is living.

Vector—A carrier organism (such as a fly or mosquito) which serves to deliver a virus (or other agent of infection) to a host.

Prevention

A very safe, very effective yellow fever vaccine exists. About 95% of vaccine recipients acquire long-term immunity to the yellow fever virus. Careful measures to decrease mosquito populations in both urban areas and jungle areas in which humans are working, along with programs to vaccinate all people living in such areas, are necessary to avoid massive yellow fever outbreaks.

Resources

BOOKS

Ray, C. George. "Arthropod-Borne and Other Zoonotic Viruses." In *Sherris Medical Microbiology: An Introduction to Infectious Diseases*. 3rd ed. Ed. Kenneth J. Ryan. Norwalk, CT: Appleton & Lange, 1994.

Shope, Robert E. "Yellow Fever." In *Cecil Textbook of Medicine*, ed. J. Claude Bennett and Fred Plum. Philadelphia: W. B. Saunders Co., 1996.

Stoffman, Phyllis. *The Family Guide to Preventing and Treating 100 Infectious Diseases*. New York: John Wiley & Sons, 1995.

PERIODICALS

Farley, Dixie. "Treating Tropical Diseases." *FDA Consumer* (Jan./Feb. 1997): 26+.

Robertson, Susan E., et al. "Yellow Fever: A Decade of Reemergence." *Journal of the American Medical Association* (9 Oct. 1996): 1157+.

ORGANIZATIONS

Centers for Disease Control and Prevention. 1600 Clifton Rd., NE, Atlanta, GA 30333. (800) 311-3435, (404) 639-3311. <<http://www.cdc.gov>>.

Rosalyn Carson-DeWitt, MD

Yersinia enterocolitica infection see

Yersinosis

Yersinia pestis see **Plague**

Yersinia pseudotuberculosis infection see

Yersinosis

Yersinosis

Definition

Yersinosis refers to infection by a genus of bacteria known as *Yersinia*. The two sub-types that are responsible for yersinosis are *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*. The diseases produced by these organisms are called “zoonoses,” because the bacteria is passed to humans from animal sources.

The name *Yersinia* comes from Dr. Alexandre Yersin, who was the first person to grow a much more deadly type of *Yersinia* known as *Yersinia pestis*, the bacteria responsible for what is now known as bubonic plague. This article, however, will deal with the more common forms of *Yersinia*, namely *Y. enterocolitica* and *Y. pseudotuberculosis*.

Description

Yersinia are classified as gram-negative bacteria (bacteria that do not accept the color of a stain in a Gram stain test, which indicates the general chemical nature of the cell wall of the bacteria); they have a variety of appearances, and are therefore called pleomorphic. They belong to Enterobacteriaceae, the large group of organisms that inhabit the intestinal tract. There are many different subtypes of *Yersinia*.

They are found worldwide and have been isolated from soil, fresh water, contaminated foods, and many wild and domestic animals. For reasons not entirely clear, disease caused by these organisms occurs more frequently in areas of northern Europe, especially Scandinavia. Infection, particularly in children ages one through four years, is quite common, though often these infections produce few symptoms. Studies have shown that infection with these bacteria is almost as common as that with *Shigella* or *Campylobacter*.

Causes and symptoms

Animals are the most important sources of bacterial infection for humans. Whether from pets or undercooked

meat (especially pork), these bacteria almost always enter the human body through the mouth (oral transmission). An incubation period of one to eleven days passes before signs of disease develop. Rare cases have been transmitted by way of contaminated blood transfusions.

Yersinia produces several different types of disease. The most common form is a short-lived inflammation of the intestine known as enterocolitis. Most often the very end of the small intestine is involved, an area known as the terminal ileum. The result is **gastroenteritis**, with cramping abdominal **pain**, **fever**, and **diarrhea**. Diarrhea generally continues for two weeks or so, but can go on for many months. Up to 40% of patients also experience **nausea and vomiting**; and in one-third, inflammation of the intestine leads to bleeding.

In other patients, the same area of the intestine is involved, but instead of causing diarrhea, a syndrome resembling **appendicitis** occurs. In this syndrome, the lymph nodes surrounding the intestine are especially involved; this has lead to the term mesenteric adenitis. Although this syndrome resolves without serious consequences, it is often difficult to differentiate from appendicitis, and leads to surgery in some instances. Ultrasound exam may be able to demonstrate a normal appendix and avoid surgery. Why some patients develop symptoms of gastroenteritis, and others only inflammation, pain, and fever, is unknown.

In some patients, *Yersinia* produces infection of areas other than the intestinal tract. These include:

- Inflammation of the throat (pharyngitis) and **tonsillitis**; this can be quite severe and even lead to **death**, particularly in adults.
- Septicemia, or infection of the blood stream, with spreading of infection to other organs such as bone, meninges, kidneys, and others. Individuals with decreased immunity due to liver disease, diabetes, **cancer**, and other diseases are at increased risk for this complication.

Different parts of the body may be affected (such as joints, eyes, and urinary system) by changes in the immune system caused by *Yersinia* infection. Arthritis, which is especially frequent in Scandinavia, occurs in up to 10% of *Yersinia* infections. About one week after typical intestinal symptoms, swelling and pain in multiple joints occurs. The knees and ankles are most often involved, and become inflamed over a period of two weeks. In two-thirds of those affected, symptoms gradually resolve over one to three months without need for treatment. Rarely does chronic joint disease develop.

Inflammation of the heart muscle, called **myocarditis**, sometimes occurs together with the arthritis. In about

15–20% of patients, the skin develops a red, raised area, usually located on the shins, called **erythema nodosum**. This appears within a few weeks of the intestinal symptoms and disappears over a month or so.

Diagnosis

Identifying *Yersinia* as the cause of all or any of these symptoms is not an easy task. It is possible to grow the organism from stool cultures, but this is difficult to do unless special methods are used.

A change in antibody levels can also be used to determine the presence of infection. To be accurate, levels must be initially examined early in the illness. Therefore, it is most important for the possible diagnosis and examination to be thought of early.

Treatment

Since most of the symptoms caused by *Yersinia* are self limiting, specific antibiotic treatment is generally not needed. Patients with **dehydration** from gastroenteritis are given supportive therapy, including treatment aimed at replacing fluids.

Antibiotics are indicated, however, for those patients who develop more severe infections, such as invasion of the bloodstream (septicemia), or who develop infections at specific sites, such as bone. A variety of antibiotics have been used, but it is not clear which produces the best results.

No specific treatment is indicated for the joint, ocular, skin, or urinary symptoms that result from infection. As stated, these are not due to direct invasion by the bacteria, but are related to changes in immune reactions produced by the infection. However, treatment of those experiencing severe arthritic symptoms with NSAIDS (**nonsteroidal anti-inflammatory drugs**) or steroid injection at inflamed joints is used in selected cases.

Prognosis

As noted above, most of the time, *Yersinia* infection has an excellent outlook. However, when these bacteria invade the bloodstream or produce disease beyond the gastrointestinal tract, the outlook is less positive. This may be because more severe infections occur in those with decreased immunity. Death rate from septicemia has been reported to be as high as 50%.

Prevention

Safe food handling procedures and food-preparation practices are by far the best means of avoiding infection.

KEY TERMS

Mesenteric adenitis—Inflammation of the lymph nodes which serve the small intestine. Has symptoms similar to appendicitis.

Septicemia—Systemic disease associated with the presence of microorganisms or their toxins in the blood; blood poisoning.

Undercooked food, especially pork or other animal products, should not be eaten.

Resources

BOOKS

Campbell, Grant L., and David T. Dennis. "Other *Yersinia* Infections." In *Harrison's Principles of Internal Medicine*, ed. Anthony S. Fauci, et al. New York: McGraw-Hill, 1997.

Hamer, Davidson H., and Sherwood L. Gorbach. "*Yersinia*." In *Sleisenger & Fordtran's Gastrointestinal and Liver Disease*, ed. Mark Feldman, et al. Philadelphia: W. B. Saunders Co., 1997.

OTHER

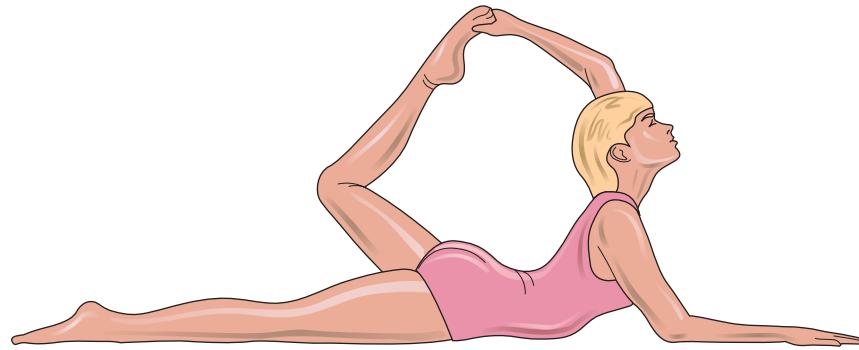
"Bad Bug Book." Center for Food Safety and Applied Nutrition. <<http://vm.cfsan.fda.gov/~mow/intro.html>>.

David Kaminstein, MD

I Yoga

Definition

The term *yoga* comes from a Sanskrit word which means yoke or union. Traditionally, yoga is a method joining the individual self with the Divine, Universal Spirit, or Cosmic Consciousness. Physical and mental exercises are designed to help achieve this goal, also called self-transcendence or enlightenment. On the physical level, yoga postures, called *asanas*, are designed to tone, strengthen, and align the body. These postures are performed to make the spine supple and healthy and to promote blood flow to all the organs, glands, and tissues, keeping all the bodily systems healthy. On the mental level, yoga uses breathing techniques (*pranayama*) and **meditation** (*dyana*) to quiet, clarify, and discipline the mind. However, experts are quick to point out that yoga



Yoga is a system that benefits the body, mind, and spirit by teaching self-control through a series of postures and exercises as well as through breathing, relaxation, and meditation techniques. (Illustration by Electronic Illustrators Group.)

is not a religion, but a way of living with health and peace of mind as its aims.

Purpose

Yoga has been used to alleviate problems associated with high blood pressure, **high cholesterol**, migraine headaches, **asthma**, shallow breathing, backaches, **constipation**, diabetes, **menopause**, **multiple sclerosis**, **varicose veins**, **carpal tunnel syndrome** and many chronic illnesses. It also has been studied and approved for its ability to promote relaxation and reduce **stress**.

Yoga can also provide the same benefits as any well-designed **exercise** program, increasing general health and stamina, reducing stress, and improving those conditions brought about by sedentary lifestyles. Yoga has the added advantage of being a low-impact activity that uses only gravity as resistance, which makes it an excellent physical therapy routine; certain yoga postures can be safely used to strengthen and balance all parts of the body.

Meditation has been much studied and approved for its benefits in reducing stress-related conditions. The landmark book, *The Relaxation Response*, by Harvard cardiologist Herbert Benson, showed that meditation and breathing techniques for relaxation could have the opposite effect of stress, reducing blood pressure and other indicators. Since then, much research has reiterated the benefits of meditation for **stress reduction** and general health. Currently, the American Medical Association recommends meditation techniques as a first step before medication for borderline **hypertension** cases.

Modern psychological studies have shown that even slight facial expressions can cause changes in the involuntary nervous system; yoga utilizes the mind/body connection. That is, yoga practice contains the central ideas that

physical posture and alignment can influence a person's mood and self-esteem, and also that the mind can be used to shape and heal the body. Yoga practitioners claim that the strengthening of mind/body awareness can bring eventual improvements in all facets of a person's life.

Description

Origins

Yoga originated in ancient India and is one of the longest surviving philosophical systems in the world. Some scholars have estimated that yoga is as old as 5,000 years; artifacts detailing yoga postures have been found in India from over 3000 b.c. Yoga masters (*yogis*) claim that it is a highly developed science of healthy living that has been tested and perfected for all these years. Yoga was first brought to America in the late 1800s when Swami Vivekananda, an Indian teacher and yogi, presented a lecture on meditation in Chicago. Yoga slowly began gaining followers, and flourished during the 1960s when there was a surge of interest in Eastern philosophy. There has since been a vast exchange of yoga knowledge in America, with many students going to India to study and many Indian experts coming here to teach, resulting in the establishment of a wide variety schools. Today, yoga is thriving, and it has become easy to find teachers and practitioners throughout America. A recent Roper poll, commissioned by *Yoga Journal*, found that 11 million Americans do yoga at least occasionally and 6 million perform it regularly. Yoga stretches are used by physical therapists and professional sports teams, and the benefits of yoga are being touted by movie stars and Fortune 500 executives. Many prestigious schools of medicine have studied and introduced yoga techniques as proven therapies for illness and stress. Some medical schools, like UCLA, even offer yoga classes as part of their physician training program.

Classical yoga is separated into eight limbs, each a part of the complete system for mental, physical and spiritual well-being. Four of the limbs deal with mental and physical exercises designed to bring the mind in tune with the body. The other four deal with different stages of meditation. There are six major types of yoga, all with the same goals of health and harmony but with varying techniques: hatha, raja, karma, bhakti, jnana, and tantra yoga. **Hatha yoga** is the most commonly practiced branch of yoga in America, and it is a highly developed system of nearly 200 physical postures, movements and breathing techniques designed to tune the body to its optimal health. The yoga philosophy believes the breath to be the most important facet of health, as the breath is the largest source of *prana*, or life force, and hatha yoga utilizes *spranayama*, which literally means the science or control of breathing. Hatha yoga was originally developed as a system to make the body strong and healthy enough to enable mental awareness and spiritual enlightenment.

There are several different schools of hatha yoga in America; the two most prevalent ones are Iyengar and ashtanga yoga. Iyengar yoga was founded by B.K.S. Iyengar, who is widely considered as one of the great living innovators of yoga. Iyengar yoga puts strict emphasis on form and alignment, and uses traditional hatha yoga techniques in new manners and sequences. Iyengar yoga can be good for physical therapy because it allows the use of props like straps and blocks to make it easier for some people to get into the yoga postures. Ashtanga yoga can be a more vigorous routine, using a flowing and dance-like sequence of hatha postures to generate body heat, which purifies the body through sweating and deep breathing.

The other types of yoga show some of the remaining ideas which permeate yoga. Raja yoga strives to bring about mental clarity and discipline through meditation, simplicity, and non-attachment to worldly things and desires. Karma yoga emphasizes charity, service to others, non-aggression and non-harming as means to awareness and peace. Bhakti yoga is the path of devotion and love of God, or Universal Spirit. Jnana yoga is the practice and development of knowledge and wisdom. Finally, tantra yoga is the path of self-awareness through religious rituals, including awareness of sexuality as sacred and vital.

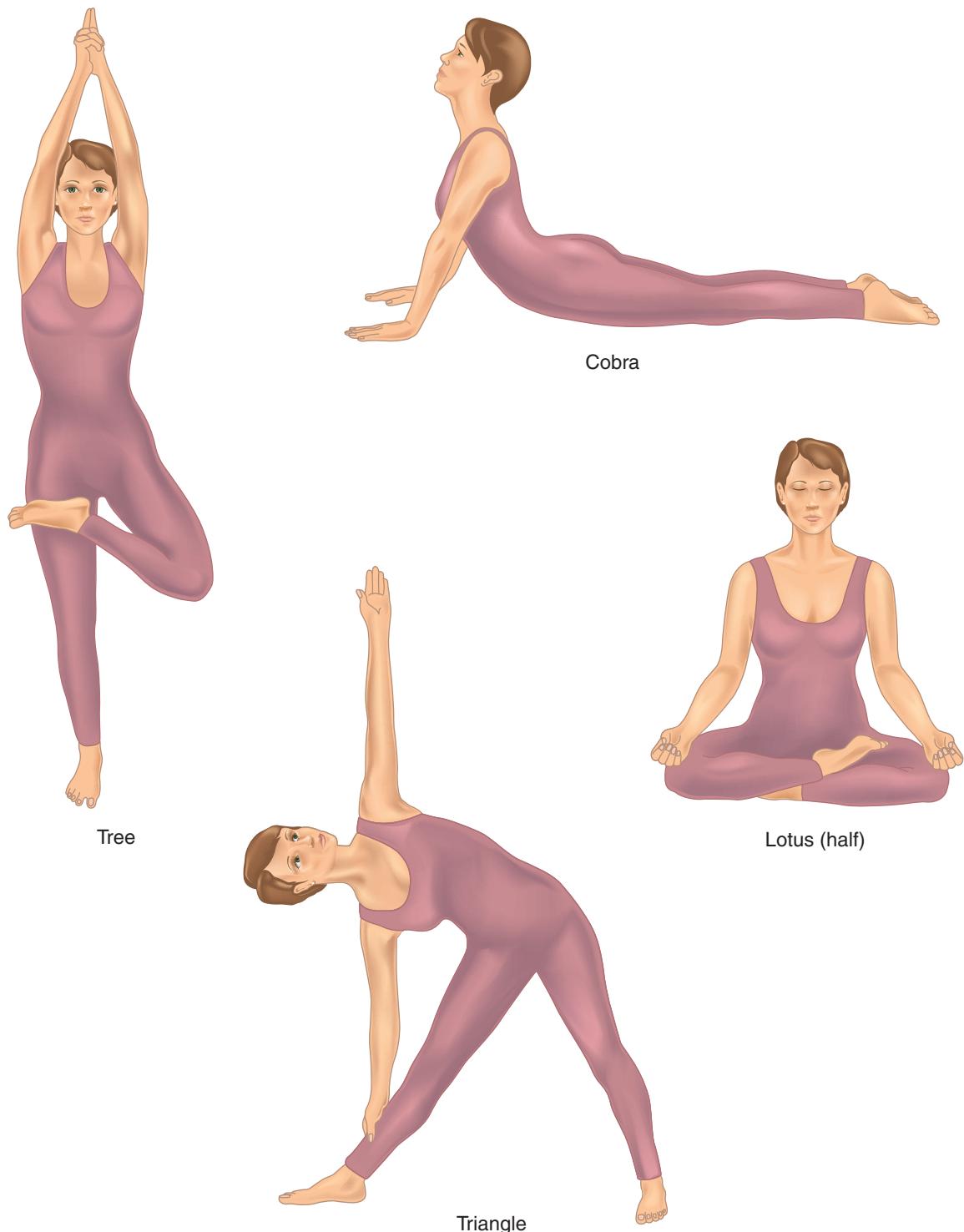
A typical hatha yoga routine consists of a sequence of physical poses, or asanas, and the sequence is designed to work all parts of the body, with particular emphasis on making the spine supple and healthy and increasing circulation. Hatha yoga asanas utilize three basic movements: forward bends, backward bends, and twisting motions. Each asana is named for a common thing it resembles, like the sun salutation, cobra, locust, plough, bow, eagle, tree, and the head to knee pose, to

PATANJALI

There is little historical information available on Patanjali, who is credited with developing yoga, one of the six systems of Hindu philosophy. Several scholars suggest several persons may have developed yoga under the pseudonym of Patanjali. In any case, Patanjali existed around 150 B.C. in India. He developed yoga based on a loose set of doctrines and practices from the Upanishads, themselves a set of mystical writings. The Upanishads are part of the Aranyakas, philosophical concepts that are part of the Veda, the most ancient body of literature of Hinduism. Patanjali gave these combined philosophical and esoteric writings a common foundation in his *Yoga Sutra*, a set of 196 concise aphorisms (wise sayings) that form the principles of yoga. He also drew upon Samkhya, the oldest classic system of Hindu philosophy. Patanjali's yoga accepted Samkhya metaphysics and the concept of a supreme soul. He established an eight-stage discipline of self-control and meditation. The individual sutras (verses) lay out the entire tradition of meditation. They also describe the moral and physical disciplines needed for the soul to attain absolute freedom from the body and self.

name a few. Each pose has steps for entering and exiting it, and each posture requires proper form and alignment. A pose is held for some time, depending on its level of difficulty and one's strength and stamina, and the practitioner is also usually aware of when to inhale and exhale at certain points in each posture, as breathing properly is another fundamental aspect of yoga. Breathing should be deep and through the nose. Mental concentration in each position is also very important, which improves awareness, poise and posture. During a yoga routine there is often a position in which to perform meditation, if deep relaxation is one of the goals of the sequence.

Yoga routines can take anywhere from 20 minutes to two or more hours, with one hour being a good time investment to perform a sequence of postures and a meditation. Some yoga routines, depending on the teacher and school, can be as strenuous as the most difficult workout, and some routines merely stretch and align the body while the breath and heart rate are kept slow and steady. Yoga achieves its best results when it is practiced as a daily discipline, and yoga can be a life-long exercise routine, offering deeper and more challenging positions as a practitioner becomes more adept. The basic positions can increase a person's strength, flexibility and sense of well-being almost immediately, but it can take years to perfect and deepen them, which is an appealing and stimulating aspect of yoga for many.



Demonstrations of the tree, triangle, cobra, and lotus poses. The tree and triangle are good for balance and coordination. Cobra stretches the pelvic and strengthens the back. Lotus is a meditative pose. (*Illustration by Electronic Illustrators Group.*)

Yoga is usually best learned from a yoga teacher or physical therapist, but yoga is simple enough that one can learn the basics from good books on the subject, which are plentiful. Yoga classes are generally inexpensive, averaging around 10 dollars per class, and students can learn basic postures in just a few classes. Many YMCAs, colleges, and community health organizations offer beginning yoga classes as well, often for nominal fees. If yoga is part of a physical therapy program, it can be reimbursed by insurance.

Preparations

Yoga can be performed by those of any age and condition, although not all poses should be attempted by everyone. Yoga is also a very accessible form of exercise; all that is needed is a flat floor surface large enough to stretch out on, a mat or towel, and enough overhead space to fully raise the arms. It is a good activity for those who can't go to gyms, who don't like other forms of exercise, or have very busy schedules. Yoga should be done on an empty stomach, and teachers recommend waiting three or more hours after meals. Loose and comfortable clothing should be worn.

Precautions

People with injuries, medical conditions, or spinal problems should consult a doctor before beginning yoga. Those with medical conditions should find a yoga teacher who is familiar with their type of problem and who is willing to give them individual attention. Pregnant women can benefit from yoga, but should always be guided by an experienced teacher. Certain yoga positions should not be performed with a **fever**, or during menstruation.

Beginners should exercise care and concentration when performing yoga postures, and not try to stretch too much too quickly, as injury could result. Some advanced yoga postures, like the headstand and full lotus position, can be difficult and require strength, flexibility, and gradual preparation, so beginners should get the help of a teacher before attempting them.

Yoga is not a competitive sport; it does not matter how a person does in comparison with others, but how aware and disciplined one becomes with one's own body and limitations. Proper form and alignment should always be maintained during a stretch or posture, and the stretch or posture should be stopped when there is **pain**, **dizziness**, or **fatigue**. The mental component of yoga is just as important as the physical postures. Concentration and awareness of breath should not be neglected. Yoga should be done with an open, gentle, and non-critical mind; when one stretches into a yoga position, it can be thought of accepting and working on one's limits. Impa-

KEY TERMS

Asana—A position or stance in yoga.

Dyana—The yoga term for meditation.

Hatha yoga—Form of yoga using postures, breathing methods and meditation.

Meditation—Technique of concentration for relaxing the mind and body.

Pranayama—Yoga breathing techniques.

Yogi—A trained yoga expert.

tience, self-criticism and comparing oneself to others will not help in this process of self-knowledge. While performing the yoga of breathing (pranayama) and meditation (dyana), it is best to have an experienced teacher, as these powerful techniques can cause dizziness and discomfort when done improperly.

Side effects

Some people have reported injuries by performing yoga postures without proper form or concentration, or by attempting difficult positions without working up to them gradually or having appropriate supervision. Beginners sometimes report muscle soreness and fatigue after performing yoga, but these side effects diminish with practice.

Research and general acceptance

Although yoga originated in a culture very different from modern America, it has been accepted and its practice has spread relatively quickly. Many yogis are amazed at how rapidly yoga's popularity has spread in America, considering the legend that it was passed down secretly by handfuls of adherents for many centuries.

There can still be found some resistance to yoga, for active and busy Americans sometimes find it hard to believe that an exercise program that requires them to slow down, concentrate, and breathe deeply can be more effective than lifting weights or running. However, ongoing research in top medical schools is showing yoga's effectiveness for overall health and for specific problems, making it an increasingly acceptable health practice.

Resources

BOOKS

Ansari, Mark, and Lark, Liz. *Yoga for Beginners*. New York: Harper, 1999.

Bodian, Stephan, and Feuerstein, Georg. *Living Yoga*. New York: Putnam, 1993.
Carrico, Mara. *Yoga Journal's Yoga Basics*. New York: Henry Holt, 1997.
Iyengar, B.K.S. *Light on Yoga*. New York: Schocken, 1975.

PERIODICALS

Yoga Journal. P.O. Box 469088, Escondido, CA 92046.
<<http://www.yogajournal.com>>.
Yoga International Magazine. R.R. 1 Box 407, Honesdale, PA
18431. <<http://www.yimag.com>>.

ORGANIZATIONS

International Association of Yoga Therapists (IAYT), 4150
Tivoli Ave., Los Angeles, CA 90066.

OTHER

<<http://www.yogadirectory.com>>.
<<http://www.yogafinder.com>>.

Douglas Dupler

"Yuppie flu" see **Chronic fatigue syndrome**

Z

Zenker's diverticulum see **Esophageal pouches**

Zidovudine see **Antiretroviral drugs**

Zinc deficiency see **Mineral deficiency**

Zinc excess see **Mineral toxicity**

Zolpidem see **Anti-insomnia drugs**

Zoonosis

Definition

Zoonosis, also called *zoonotic disease* refers to diseases that can be passed from animals, whether wild or domesticated, to humans.

Description

Although many diseases are species specific, meaning that they can only occur in one animal species, many other diseases can be spread between different animal species. These are infectious diseases, caused by bacteria, viruses, or other disease causing organisms that can live as well in humans as in other animals.

There are different methods of transmission for different diseases. In some cases, zoonotic diseases are transferred by direct contact with infected animals, much as being near an infected human can cause the spread of an infectious disease. Other diseases are spread by drinking water that contains the eggs of parasites. The eggs enter the water supply from the feces of infected animals. Still others are spread by eating the flesh of infected animals. Tapeworms are spread this way. Other diseases are spread by insect vectors. An insect, such as a flea or tick, feeds on an infected animal, then feeds on a human. In the process, the insect transfer the infecting organism.

Some zoonotic diseases are well known, such as rats (**plague**), deer tick (**Lyme disease**). Others are not as well known. For example, elephants may develop **tuberculosis**, and spread it to humans.

Causes and symptoms

The following is a partial list of animals and the diseases that they may carry. Not all animal carriers are listed, nor are all the diseases that the various species may carry.

- Bats are important **rabies** carriers, and also carry several other viral diseases that can affect humans.
- Cats may carry the causative organisms for plague, **anthrax**, cowpox, tapeworm, and many bacterial infections.
- Dogs may carry plague, tapeworm, rabies, **Rocky Mountain Spotted Fever**, and Lyme disease.
- Horses may carry anthrax, rabies, and *Salmonella* infections.
- Cattle may carry the organisms that cause anthrax, European tick-borne **encephalitis**, rabies, tapeworm, *Salmonella* infections and many bacterial and viral diseases.
- Pigs are best known for carrying tapeworm, but may also carry a large number of other infections including anthrax, **influenza**, and rabies.
- Sheep and goats may carry rabies, European tick-borne encephalitis, *Salmonella* infections, and many bacterial and viral diseases.
- Rabbits may carry plague and Q-Fever.
- Birds may carry *Campylobacteriosis*, *Chlamydia psittaci*, *Pasteurella multocida*, *Histoplasma capsulatum*, *Salmonellosis*, and others.

Zoonotic diseases may be spread in different ways. Tapeworms care often spread to humans when they eat the infected meat of fish, cattle, and swine. Other diseases are transferred by insect vectors, often blood-feeding insects that carry the cause of the disease from one animal to another.

KEY TERMS

Anthrax—A disease of warm blooded animals, particularly cattle and sheep, transmissible to humans. The disease causes severe skin and lung damage.

Bovine spongiform encephalopathy—A progressive, fatal disease of the nervous system of domestic animals. It is transmitted by eating infected food.

Lyme disease—An acute disease which is usually marked by skin rash, fever, fatigue and chills. Left untreated, it may cause heart and nervous system damage.

Q-Fever—A disease that is marked by high fever, chills and muscle pain. It is seen in North America, Europe, and parts of Africa. It may be spread by drinking raw milk, or by tick bites.

Zoonotic—A disease which can be spread from animals to humans.

Diagnosis

Diagnosis of the disease is made in the usual manner, by identifying the infecting organism. Each disease has established symptoms and tests. Identifying the carrier may be easy, or may be more difficult when the cause is a fairly common infection. For example, tapeworms are usually species specific. Cattle, pigs, and fish all carry different species of tapeworms, although all can be transmitted to humans who eat undercooked meat containing live tapeworm eggs. Once the tapeworm has been identified, it is easy to tell which species the tapeworm came from.

Other zoonotic infections may be harder to identify. Sometimes the infection is fairly common among both humans and animals, and it is impossible to tell. Snakes may carry the bacteria *Escherichia coli* and *Proteus vulgaris*, but since these bacteria are already common among humans, it would be difficult to trace infections back to snakes.

Because of increased trade between nations, and changes in animal habitats, there are often new zoonotic diseases. These may be found in animals transported from one nation to another, bringing with them new diseases. In some cases, changes in the environment lead to changes in the migratory habits of animal species, bringing new infections.

Treatment

Treatment is the established treatment for the specific infection.

Prevention

Prevention of zoonotic infections may take different forms, depending on the nature of the carrier and the infection.

Some zoonotic infections can be avoided by immunizing the animals that carry the disease. Pets and other domestic animals should have rabies vaccinations, and wild animals are immunized with an oral vaccine that is encased in a suitable bait. In some places, the bait is dropped by airplane over the range of the potential rabies carrier. When the animal eats the bait, they also ingest the oral vaccine, thereby protecting them from rabies, and reducing the risk of spread of the disease. This method has been used to protect foxes, coyotes, and other wild animals.

Many zoonotic diseases that are passed by eating the meat of infected animals can be prevented by proper cooking of the infected meat. Tapeworm infestations can be prevented by cooking, and *Salmonella* infections from chickens and eggs can be prevented by being sure that both the meat and the eggs are fully cooked.

For other zoonotic diseases, programs are in place to eliminate the host, or the vector that spreads the disease. Plague is prevented by elimination of the rats—a common source of the infection—and of fleas that carry the disease from rats to humans. Efforts to control bovine spongiform encephalitis, better known as Mad Cow disease, have focused on the destruction of infected cattle to prevent spread of the disease.

Other means of prevention simply rely on care. People living in areas where Lyme disease is common are warned to take precautions against the bite of the deer tick, which transfers the disease. These precautions include not walking in tall grass, not walking bare legged, and wearing light-colored clothing so that the presence of the dark ticks can be readily seen.

Resources

PERIODICALS

- “CDC improves monitoring of outbreaks.” *American Medical News* (January 24, 2000).
- “When man’s best friend isn’t.” *Mother Earth News* (June/July 2000).
- “The zoonotic threat: Curbing pet-to-people infections.” *Dog World* (October 1999).
- “Zoonoses.” *Agricultural Research* (February 2000).

ORGANIZATIONS

- American Association of Zoo Keepers (AAZK). Topeka Zoological Park 3601 SW 29th St., Ste. 133 Topeka, KS 66614-2054.
- National Animal Disease Center Zoonotic Research Unit. 2300 Dayton Ave. PO Box 70 Ames, IA 50010.

Samuel Uretsky, PharmD

ORGANIZATIONS

The following is an alphabetical compilation of organizations listed in the *Resources* section of the main body entries. Although the list is comprehensive, it is by no means exhaustive. It is a starting point for further information, as well as other online and print sources. Many of the organizations listed provide information for multiple disorders and have links to additional related websites. E-mail addresses and web addresses listed were provided by the associations; Gale Group is not responsible for the accuracy of the addresses or the contents of the websites.

A

Academy of General Dentistry
Ste. 1200, 211 East Chicago Ave.
Chicago, IL 60611
(312) 440-4300
<http://www.wagd.org>

Academy for Guided Imagery
PO Box 2070
Mill Valley, CA 94942
(800) 726-2070

Achromatopsia Network
C/O Frances Futterman
PO Box 214
Berkeley, CA 94701-0214
http://wwwachromat.org/how_to_join.html

Acid Maltase Deficiency Association
PO Box 700248
San Antonio, TX 78270-0248
(210) 494-6144
<http://www.amda-pompe.org>

Acoustic Neuroma Association of Canada
Box 369 Edmonton, AB T5J 2J6
(800) 561-ANAC(2622)
(780) 428-3384
anac@compusmartab.ca
<http://www.anac.ca>

Action Against Allergy (AAA)
PO Box 278
Twickenham Middlesex, Greater London TW1 4QQ
United Kingdom

Acupressure Institute
1533 Shattuck Ave
Berkeley, CA 94709

Advancement of Women's Health Research
1828 L St NW, Ste. 625
Washington, DC 20036
(202) 223-8224
<http://www.womens-health.org>

Aerospace Medical Association
320 S Henry St
Alexandria, VA 22314-3579
(703) 739-2240
<http://www.asma.org>

Agoraphobics Building Independent Lives
3805 Cutshaw Ave, Ste. 415, Dept W
Richmond, VA 23230
(804) 353-3964
<http://www.anxietysupport.org>

Agoraphobic Foundation of Canada
PO Box 132
Chomedey, Laval, Quebec H7W 4K2
Canada

Agoraphobics In Motion
605 W 11 Mile Rd
Royal Oak, MI 48067
(248) 547-0400

Al-Anon, Al-anon Family Group, Inc
PO Box 862, Midtown Station
New York, NY 10018-0862
(800)356-9996
<http://www.recovery.org/aa>

Albert Ellis Institute
45 East 65th St
New York, NY 10021
(800) 323-4738
<http://www.rebt.org>

Alcoholics Anonymous (AA)
General Service Office
475 Riverside Dr
New York, NY 10015
(212) 870-3400
<http://www.alcoholics-anonymous.org>

Alexander Graham Bell Association for the Deaf
3417 Volta Place NW
Washington, DC 20007
(202) 337-5220
<http://www.agbell.org>

Alexander Technique International
1692 Massachusetts Ave, 3rd Floor
Cambridge, MA 02138

(888) 321-0856
Fax: (617) 497-2615
ati@ati-netcom
<http://www.ati-net.com>

Alliance of Genetic Support Groups
4301 Connecticut Ave NW, Ste. 404
Washington, DC 20008
(202)966-5557
<http://www.geneticalliance.org>

Alliance for Lung Cancer Advocacy, Support and Education
PO Box 849
Vancouver, WA 98666
(800) 298-2436
<http://www.alcase.org>

Alzheimer's Association
919 North Michigan Ave, Ste. 1000
Chicago, IL 60611
(800) 272-3900
<http://www.alz.org>

Ambiguous Genitalia Support Network
PO Box 313
Clements, CA 95227
(209) 727-0313

American Academy of Allergy Asthma and Immunology
611 East Wells St
Milwaukee, WI 53202
(800) 822-2762
<http://www.aaaai.org>

American Academy of Audiology
8201 Greensboro Dr, Ste. 300
McLean, VA 22102
(703) 610-9022
<http://audiology.org>

American Academy of Child and Adolescent Psychiatry (AACAP)
3615 Wisconsin Ave NW
Washington, DC 20016
(202) 966-7300
<http://www.aacap.org>

- American Academy of Clinical Sexologists**
1929 18th St NW, Ste. 1166
Washington, DC 20009
(202) 462-2122
- American Academy of Cosmetic Surgery**
401 N Michigan Ave
Chicago, IL 60611-4267
(313) 527-6713
[<http://www.cosmeticsurgeryonline.com>](http://www.cosmeticsurgeryonline.com)
- American Academy of Dermatology**
930 N Meacham Road
PO Box 4014
Schaumburg, IL 60168-4014
(847) 330-0230
[<http://www.aad.org>](http://www.aad.org)
- American Academy of Emergency Medicine**
611 East Wells St
Milwaukee, WI 53202
(800) 884-2236
Fax: (414) 276-3349
[<http://www.aaem.org/>](http://www.aaem.org)
- American Academy of Environmental Medicine**
PO Box CN 1001-8001
New Hope, PA 18938
(215) 862-4544
- American Academy of Facial, Plastic, and Reconstructive Surgery**
1110 Vermont Ave NW, Ste. 220
Washington, DC 20005
(800) 332-3223
- American Academy of Family Physicians**
11400 Tomahawk Creek Parkway
Leawood, KS 66211-2672
(913) 906-6000
[<http://www.aafp.org>](http://www.aafp.org)
- American Academy of Husband-Coached Childbirth**
PO Box 5224
Sherman Oaks, CA 91413
(800) 423-2397
(800) 422-4784 (in California)
- American Academy of Medical Acupuncture**
2520 Milvia St
Berkeley, CA 94704
(415) 841-3220
- American Academy of Neurology**
1080 Montreal Ave
St Paul, MN 55116
(612) 695-1940
[<http://www.aan.com>](http://www.aan.com)
- American Academy of Ophthalmology**
655 Beach St
PO Box 7424
San Francisco, CA 94120-7424
[<http://www.eyenet.org>](http://www.eyenet.org)
- American Academy of Orthopaedic Surgeons**
6300 N River Road
Rosemont, IL 60018
(847) 823-7186
[<http://www.aaos.org>](http://www.aaos.org)
- American Academy of Otolaryngology-Head and Neck Surgery, Inc**
One Prince St
Alexandria, VA 22314-3357
(703) 836-4444
[<http://www.entnet.org>](http://www.entnet.org)
- American Academy of Pediatric Dentistry**
211 East Chicago Ave, Ste. 700
Chicago, IL 60611-2616
(312) 337-2169
[<http://www.aapd.org>](http://www.aapd.org)
- American Academy of Pediatrics**
141 Northwest Point Blvd
Elk Grove Village, IL 60007-1098
(847) 434-4000
Fax: (847) 434-8000
[<http://www.aap.org/visit/contact.htm>](http://www.aap.org/visit/contact.htm)
- American Academy of Wound Management**
1255 23rd St NW
Washington, DC 20037
(202) 521-0368
[<http://www.aawm.org>](http://www.aawm.org)
- American Allergy Association (AAA)**
3104 E Camelback, Ste. 459
Phoenix, AZ 85016
- American Amputation Foundation Inc**
PO Box 250218
Hillcrest Station
Little Rock, AR 72225
(501) 666-2523
- American Anorexia/Bulimia Association Inc**
293 Central Park West, Ste. IR
New York, NY 10024
(212) 501-8351
- American Art Therapy Association**
1202 Allanson Rd
Mundelein, IL 60060-3808
(888) 290-0878
(847) 949-6064
Fax: (847) 566-4580
arttherapy@ntrnet
[<http://www.arttherapy.org>](http://www.arttherapy.org)
- American Association of Acupuncture & Oriental Medicine**
4101 Lake Boone Trail, Ste. 201
Raleigh, NC 27607
(919) 787-5181
- American Association of Blood Banks**
8101 Glenbrook Road
Bethesda, MD 20814
(301) 907-6977
[<http://www.aabb.org>](http://www.aabb.org)
- American Association of Colleges of Osteopathic Medicine**
5550 Friendship Blvd, Ste. 310
Chevy Chase, MD 20815-7231
(301) 968-4100
[<http://www.aacom.org>](http://www.aacom.org)
- American Association for Chronic Fatigue Syndrome**
7 Van Buren St
Albany, NY 12206
(518) 435-1765
[<http://weberuwashington.edu/~dedra/aacfs1.html>](http://weberuwashington.edu/~dedra/aacfs1.html)
- American Association of the Deaf-Blind**
814 Thayer Ave, Ste. 302
Silver Spring, MD 20910
(301) 588-6545
- American Association of Endodontists**
211 East Chicago Ave, Ste. 1100
Chicago, IL 60611-2691
(800) 872-3636
[<http://www.aae.org>](http://www.aae.org)
- American Association of Kidney Patients (AAKP)**
100 S Ashley Dr, Ste. 280
Tampa, FL 33602
(800) 749-2257
[<http://www.aakp.org>](http://www.aakp.org)
- American Association of Nutritional Consultants**
810 S Buffalo St
Warsaw, IN 46580
(888) 828-2262
- American Association for Marriage and Family Therapy**
1133 15th St NW, Ste. 300
Washington, DC 20005-2710
(202) 452-0109
[<http://www.aamft.org>](http://www.aamft.org)
- American Association on Mental Retardation (AAMR)**
444 North Capitol St NW, Ste. 846
Washington, DC 20001-1512
(800) 424-3688
[<http://www.aamr.org>](http://www.aamr.org)

- American Association of Naturopathic Physicians**
601, Valley St, Ste. 105
Seattle, WA 98109
(206) 298-0126
[<http://www.naturopathic.org>](http://www.naturopathic.org)
- American Association of Oral & Maxillofacial Surgeons**
9700 W Bryn Mawr Ave
Rosemont, IL 60018
(847) 678-6200
- American Association of Oriental Medicine**
433 Front St
Catasauqua, PA 18032
(888) 500-7999
[<http://www.aaom.org>](http://www.aaom.org)
- American Association of Orthodontists**
401 North Lindbergh Blvd
St Louis, MO 63141-7816
(314) 993-1700
[<http://www.aaortho.org>](http://www.aaortho.org)
- American Association for Respiratory Care**
11030 Ables Lane
Dallas, TX 75229
(972) 243-2272
[<http://www.aarc.org>](http://www.aarc.org)
- American Association of Sex Educators Counselors and Therapists**
PO Box 5488
Richmond, VA 23220
[<http://www.aasect.org>](http://www.aasect.org)
- American Association of Tissue Banks**
1350 Beverly Road, Ste. 220-A
McLean, VA 22101
(703) 827-9582
- American Behcet's Disease Association**
PO Box 280240
Memphis, TN 38168-0240
[<http://www.behcets.com>](http://www.behcets.com)
- American Board of Hypnotherapy**
16842 Von Karman Ave, Ste. 476
Irvine, CA 92714
[<http://www.hypnosis.com>](http://www.hypnosis.com)
- American Botanical Council**
PO Box 201660
Austin, TX 78720-1660
- American Brain Tumor Association**
2720 River Road, Ste. 146
Des Plaines, IL 60018-4110
(800) 886-2282
[<http://www.abta.org>](http://www.abta.org)
- American Burn Association**
625 N Michigan Ave, Ste. 1530
Chicago, IL 60611
(800) 548-2876
- <<http://www.ameriburn.org>>
- American Cancer Society (National Headquarters)**
1599 Clifton Road NE
Atlanta, GA 30329
(800) 227-2345
[<http://www.cancer.org>](http://www.cancer.org)
- American Celiac Society**
58 Musano Court
West Orange, NJ 07052
(201) 325-8837
- American Chiropractic Association**
1701 Clarendon Blvd
Arlington, VA 22209
(800) 986-4636
[<http://www.amerchiro.org>](http://www.amerchiro.org)
- American Chronic Pain Association**
PO Box 850
Rocklin, CA 95677-0850
(916) 632-0922
[<http://memberstripod.com/~widdy/ACPA.html>](http://memberstripod.com/~widdy/ACPA.html)
- American College of Allergy Asthma & Immunology**
85 West Algonquin Road, Ste. 550
Arlington Heights, IL 60005
(847) 427-1200
- American College of Angiology**
295 Northern Blvd, Ste. 104
Great Neck, NY 11021-4701
- American College of Emergency Physicians**
PO Box 619911
Dallas, TX 75261-9911
(800) 798-1822
(972) 550-0911
Fax: (972) 580-2816
info@acep.org
[<http://www.acep.org>](http://www.acep.org)
- American College of Gastroenterology**
4900 B South 31st St
Arlington, VA 22206
(703) 820-7400
[<http://www.acggi.org/ct_.html>](http://www.acggi.org/ct_.html)
- American College of Hyperbaric Medicine**
PO Box 25914-130
Houston, TX 77265
(713) 528-0657
[<http://www.hyperbaricmedicine.org>](http://www.hyperbaricmedicine.org)
- American College of Nuclear Medicine**
PO Box 175
Landisville, PA 31906
(717) 898-6006
- American College of Nutrition**
722 Robert E Lee Dr
Wilmington, NC 20412-0927
(919) 152-1222
- American College of Obstetricians and Gynecologists**
409 12th St SW
PO Box 96920
Washington, DC 20090-6920
[<http://www.acog.org>](http://www.acog.org)
- American College of Osteopathic Emergency Physicians**
142 E Ontario St, Ste. 550
Chicago, IL 60611
(312) 587-3709
(800) 521-3709
Fax: (312) 587-9951
[<http://www.acoep.org>](http://www.acoep.org)
- American College of Radiology**
1891 Preston White Dr
Reston, VA 22091
(800) 227-5463
[<http://www.acr.org>](http://www.acr.org)
- American College of Rheumatology**
1800 Century Place, Ste. 250
Atlanta, GA 30345
(404) 633-3777
[<http://www.rheumatology.org>](http://www.rheumatology.org)
- American College of Sports Medicine**
401 W Michigan St
Indianapolis, IN 46202-3233
(317) 637-9200
Fax: (317) 634-7817
mkeckhaver@acsm.org
[<http://www.acsm.org>](http://www.acsm.org)
- American College of Surgeons**
633 North St Clair St
Chicago, IL 60611-32311
(312) 202-5000
Fax: (312) 202-5001
postmaster@facso.org
[<http://www.facs.org>](http://www.facs.org)
- American Council for Headache Education (ACHE)**
19 Mantua Road
Mt Royal, NJ 08061
(800) 255-2243
[<http://www.achenet.org>](http://www.achenet.org)
- American Council on Transplantation**
PO Box 1709
Alexandria, VA 22313
(800) ACT-GIVE
- American Dental Association**
211 E Chicago Ave
Chicago, IL 60611
(312) 440-2500
[<http://www.ada.org>](http://www.ada.org)
- American Dental Hygienists' Association**
444 North Michigan Ave
Chicago, IL 60611
(800) 847-6718

- American Diabetes Association**
1701 North Beauregard St
Alexandria, VA 22311
(800) 342-2383
[<http://www.diabetes.org>](http://www.diabetes.org)
- American Dietetic Association**
216 W Jackson Blvd
Chicago, IL 60606-6995
(800) 745-0775
[<http://www.eatright.org/cdr.html>](http://www.eatright.org/cdr.html)
- American Epilepsy Society**
342 North Main St
West Hartford, CT 06117-2507
(860) 586-7505
[<http://www.aesnet.org>](http://www.aesnet.org)
- American Foundation for the Blind**
11 Penn Plaza, Ste. 300
New York, NY 10001
(800) 232-5463
- American Foundation for Homeopathy**
1508 S Garfield
Alhambra, CA 91801
- American Foundation for the Prevention of Venereal Disease Inc**
799 Broadway, Ste. 638
New York, NY 10003
(212) 759-2069
- American Foundation for Urologic Disease**
1128 N Charles St
Baltimore, MD 21201
(401) 468-1800
[<http://www.afud.org>](http://www.afud.org)
- American Gastroenterological Association (AGA)**
7910 Woodmont Ave 7th Floor
Bethesda, MD 20814
(310) 654-2055
aga001@aol.com
[<http://www.gastro.org/index.html>](http://www.gastro.org/index.html)
- American Hair Loss Council**
30 Grassy Plain Road
Bethel, CT 06801
(888) 873-9719
[<http://www.ahlc.org/>](http://www.ahlc.org)
- American Hearing Research Foundation**
55 E Washington St, Ste. 2022
Chicago, IL 60602
(312) 726-9670
[<http://www.american-hearing.org/>](http://www.american-hearing.org)
- American Heart Association**
7272 Greenville Ave
Dallas, TX 75231-4596
(214) 373-6300
(800) 242-8721
inquire@heartorg
[<http://www.americanheart.org>](http://www.americanheart.org)
- American Hemochromatosis Society Inc**
777 E Atlantic Ave PMB Z-363
Delray Beach, FL 33483-5352
(561) 266-9037
(888) 655-4766
ahs@eminet
[<http://www.americanhs.org>](http://www.americanhs.org)
- American Holistic Medical Association**
4101 Lake Boone Trail, Ste. 201
Raleigh, NC 27607
- American Humane Association Children's Division**
63 Inverness Dr East
Englewood, CO 80112-5117
(800) 227-4645
[<http://www.americanhumane.org>](http://www.americanhumane.org)
- American Institute for Cancer Research (AICR)**
1759 R St NW
Washington, DC 20009
(800) 843-8114
[<http://www.aicr.org>](http://www.aicr.org)
- American Institute of Nutrition**
9650 Rockville Pike
Bethesda, MD 20814-3990
(301) 530-7050
- American Institute of Stress**
124 Park Ave
Yonkers, NY 10703
(914) 963-1200
[<http://www.stress.org>](http://www.stress.org)
- American Institute of Ultrasound in Medicine**
14750 Sweitzer Lane, Ste. 100
Laurel, MD 20707-5906
(800) 638-5352
[<http://www.aium.org>](http://www.aium.org)
- American Institute of Vedic Studies**
PO Box 8357
Santa Fe NM 87504
(505) 983-9385
- American Kidney Foundation**
6110 Executive Blvd #1010
Rockville, MD 20852
(800) 638-8299
- American Kidney Fund (AKF)**
Ste. 1010 6110 Executive Blvd
Rockville, MD 20852
(800) 638-8299
[<http://www.arboncom/kidney>](http://www.arboncom/kidney)
- American Leprosy Missions**
1 ALM Way
Greenville SC 29601
(800)LEPROSY
- American Liver Foundation**
1425 Pompton Ave
- Cedar Grove, NJ 07009**
(800) 223-0179
[<http://www.liverfoundation.org>](http://www.liverfoundation.org)
- American Lung Association**
1740 Broadway
New York, NY 10019
(800) 586-4872
(212) 315-8700
[<http://www.lungusa.org>](http://www.lungusa.org)
- American Lyme Disease Foundation Inc**
Mill Pond Offices
293 Route 100, Ste. 204
Somers, NY 10589
(800) 876-LYME
[<http://www.w2com/docs2/d5/lyme.html>](http://www.w2com/docs2/d5/lyme.html)
- American Medical Association**
515 N State St
Chicago, IL 60610
(312) 464-5000
[<http://www.ama-assn.org/>](http://www.ama-assn.org)
- American Optometric Association**
243 North Lindbergh Blvd
St Louis, MO 63141
(314) 991-4100
[<http://www.aoanet.org>](http://www.aoanet.org)
- American Oriental Bodywork Therapy Association**
50 Maple Place
Manhasset, NY 11030
- American Orthopedic Foot and Ankle Society**
222 South Prospect
Park Ridge, IL 60068
- American Orthopaedic Society for Sports Medicine**
6300 N River Road, Ste. 200
Rosemont, IL 60018
(847) 292-4900
[<http://www.sportsmed.org>](http://www.sportsmed.org)
- American Pain Society**
4700 W Lake Ave
Glenview, IL 60025
(847) 375-4715
[<http://www.ampainsoc.org>](http://www.ampainsoc.org)
- American Parkinson Disease Association**
60 Bay St, Ste. 401
Staten Island, NY 10301
(800) 223-2732
[<http://www.apdaparkinson.org>](http://www.apdaparkinson.org)
- American Podiatric Medical Association**
9312 Old Georgetown Road
Bethesda, MD 20814-1698
(301) 571-9200
[<http://www.apma.org>](http://www.apma.org)

- American Podiatry Association**
20 Chevy Chase Circle NW
Washington, DC 20015
- American Polarity Therapy Association**
PO Box 19858
Boulder, CO 80308
(303) 545-2080
Fax: (303) 545-2161
- American Physical Therapy Association**
1111 North Fairfax St
Alexandria, VA 22314
(800) 999-2782
[<https://www.apta.org>](http://www.apta.org)
- American Porphyria Foundation**
PO Box 22712
Houston, TX 77227
(713) 266-9617
[<http://www.enterprise.net/apf/>](http://www.enterprise.net/apf)
- American Pseudo-Obstruction & Hirschsprung's Society**
158 Pleasant St
North Andover, MA 01845
(978)685-4477
- American Psychiatric Association**
1400 K St NW
Washington, DC 20005
(888) 357-7924
[<http://www.psych.org>](http://www.psych.org)
- American Psychological Association (APA)**
750 First St NE
Washington, DC 20002-4242
(202) 336-5700
[<http://www.apa.org>](http://www.apa.org)
- American Psychotherapy & Medical Hypnosis Association**
210 S Sierra
Reno, NV 89501
[\(<http://membersxoom.com/Hypnosis/>\)](http://membersxoom.com/Hypnosis/)
- American Red Cross**
PO Box 37243
Washington, DC 20013
[<http://www.redcross.org>](http://www.redcross.org)
- American Skin Association Inc**
150 E 58th St, 3rd floor
New York, NY 10155-0002
(212) 688-6547
- American Sleep Apnea Association**
1424 K St NW, Ste. 302
Washington, DC 20005
(202) 293-3650
[<http://www.sleepapnea.org>](http://www.sleepapnea.org)
- American Sleep Disorders Association**
1610 14th St NW, Ste. 300
Rochester, MN 55901
(507) 287-6006
[<http://www.asda.org>](http://www.asda.org)
- American Social Health Association**
PO Box 13827 Research
Triangle Park, NC 27709
(800) 227-8922
[<http://www.ashstd.org>](http://www.ashstd.org)
- American Society of Addiction Medicine**
4601 North Park Ave Arcade, Ste. 101
Chevy Chase, MD 20815
(301) 656-3920
[<http://www.asam.org>](http://www.asam.org)
- American Society of Cataract and Refractive Surgery**
4000 Legato Road, Ste. 850
Fairfax, VA 22033-4055
(703) 591-2220
[<http://www.ascrs.org>](http://www.ascrs.org)
- American Society of Clinical Hypnosis**
200 E Devon Ave
Des Plaines, IL 60018
- American Society of Clinical Oncology**
225 Reinekers Lane, Ste. 650
Alexandria, VA 22314
(703) 299-0150
[<http://www.asco.org>](http://www.asco.org)
- American Society of Clinical Pathologists**
2100 West Harrison St
Chicago, IL 60612
(312) 738-1336
[<http://www.ascp.org/index.asp>](http://www.ascp.org/index.asp)
- American Society of Colon and Rectal Surgeons**
85 W Algonquin Road, Ste. 550
Arlington Heights, IL 60005
(847)290-9184
- American Society for Colposcopy and Cervical Pathology**
20 W Washington St, Ste. #1
Hagerstown, MD 21740
(800) 787-7227
[<http://www.asccp.org>](http://www.asccp.org)
- American Society for Dermatologic Surgery**
930 N Meacham Road
PO Box 4014
Schaumburg, IL 60168-4014
(847) 330-9830
[<http://www.asds-net.org>](http://www.asds-net.org)
- American Society of Extra-Corporeal Technology**
11480 Sunset Hills Rd, Ste. 210E
Reston, VA 20190
(703) 435-8556
[<http://www.amsect.org>](http://www.amsect.org)
- American Society for Gastrointestinal Endoscopy**
13 Elm St Manchester, MA 01944
(508) 526-8330
[<http://www.asgeorg/doc/201>](http://www.asgeorg/doc/201)
- American Society of Hematology**
1200 19th St NW, Ste. 300
Washington, DC 20036-2422
(202) 857-1118
[<http://www.hematology.org>](http://www.hematology.org)
- American Society of Human Genetics**
9650 Rockville Pike
Bethesda, MD 20814-3998
(301) 571-1825
[<http://www.faseb.org/genetics/ashg/ashgmenu.htm>](http://www.faseb.org/genetics/ashg/ashgmenu.htm)
- American Society of Hypertension**
515 Madison Ave, Ste. 1212
New York, NY 10022
(212) 644-0650
[<http://www.ash-us.org>](http://www.ash-us.org)
- American Society for Laser Medicine and Surgery**
2404, Ste.wart Square
Wausau, WI 54401
(715) 845-9283
[<http://www.aslms.org>](http://www.aslms.org)
- American Society of Microbiology**
1752 N St NW
Washington, DC 20036
(202) 737-3600
[<http://www.asmusa.org>](http://www.asmusa.org)
- American Society of Nuclear Cardiology**
9111 Old Georgetown Road
Bethesda, MD 20814-1699
(301) 493-2360
Fax: (301) 493-2376
admin@asnc.org
[<http://www.asnc.org/>](http://www.asnc.org)
- American Society of Ophthalmic Plastic and Reconstructive Surgery**
1133 West Morse Blvd #201
Winter Park, FL 32789
(407) 647-8839
[<http://www.asoprs.org>](http://www.asoprs.org)
- American Society of Plastic and Reconstructive Surgeons**
44 E Algonquin Rd
Arlington Heights, IL 60005
(847) 228-9900
[<http://www.plasticsurgery.org>](http://www.plasticsurgery.org)
- American Society for Prophylaxis in Obstetrics/LAMAZE (ASPO /LAMAZE)**
1840 Wilson Blvd, Ste. 204
Arlington, VA 22201
(800) 368-4404

- American Society of Radiologic Technologists**
15000 Central Ave SE
Albuquerque NM 87123-3917
(505) 298-4500
[<http://www.asrt.org>](http://www.asrt.org)
- American Society for Reproductive Medicine**
1209 Montgomery Highway
Birmingham, AL 35216-2809
(205) 978-5000
[<asrm@asrm.com>](mailto:asrm@asrm.com)
[<http://www.asrm.com>](http://www.asrm.com)
- American Society for Surgery of the Hand**
6300 N River Rd, Ste. 600
Rosemont, IL 60018
[<http://www.hand-surg.org>](http://www.hand-surg.org)
- American Speech-Language-Hearing Association**
10801 Rockville Pike
Rockville, MD 20852
(800) 638-8255
[<http://www.asha.org>](http://www.asha.org)
- American Thoracic Society**
1740 Broadway
New York, NY 10019
(212) 315-8700
[<http://www.thoracic.org>](http://www.thoracic.org)
- American Thyroid Association Inc**
Montefiore Medical Center
111 E 210th St
Bronx, NY 10467
[<http://www.thyroid.org>](http://www.thyroid.org)
- American Tinnitus Association**
PO Box 5
Portland, OR 97207
(503) 248-9985
tinnitus@ata.org
- American Trauma Society**
8903 Presidential Pkwy, Ste. 512
Upper Marlboro, MD 20227
(800) 556-7890
[<http://www.amtrauma.org>](http://www.amtrauma.org)
- American Urological Association**
1120 North Charles St
Baltimore, MD 21201-5559
(410) 727-1100
[<http://www.auanet.org/index_hicfm>](http://www.auanet.org/index_hicfm)
- Amputee Coalition of America**
PO Box 2528
Knoxville, TN 37901-2528
(888) 267-5669
[<http://www.amputee-coalition.org>](http://www.amputee-coalition.org)
- Amyloidosis Network International**
7118 Cole Creek Dr
Houston, TX 77092-1421
(888) 1AMYLOID
- [<http://www.health.gov/nhic/Scripts/Entrycfm?HRCCode=HR2397>](http://www.health.gov/nhic/Scripts/Entrycfm?HRCCode=HR2397)
- Anorexia Nervosa and Related Eating Disorders Inc**
PO Box 5102
Eugene, OR 97405
(541) 344-1144
- Anxiety Disorders Association of America**
11900 Park Lawn Dr, Ste. 100
Rockville, MD 20852
(800) 545-7367
[<http://www.adaa.org>](http://www.adaa.org)
- Aplastic Anemia Foundation of America**
PO Box 613
Annapolis, MD 21404
(800) 747-2820
[<http://www.aplastic.org>](http://www.aplastic.org)
- The Arc**
900 Varnum St NE
Washington, DC 20017
(202) 636-2950
[<http://thearc.org>](http://thearc.org)
- Arc of the United States (formerly Association for Retarded Citizens of the US)**
500 East Border St, Ste. 300
Arlington, TX 76010
(817) 261-6003
[<http://thearc.org>](http://thearc.org)
- Arteriovenous Malformation Support Group**
168 Six Mile Canyon Road
Dayton, NV 89403
(702) 246-0682
- Arthritis Foundation**
1300 W Peachtree St
Atlanta, GA 30309
(800) 283-7800
[<http://www.arthritis.org>](http://www.arthritis.org)
- Association for the Advancement of Gestalt Therapy**
400 East 58th St
New York, NY 10022
(212) 486-1581
[<http://www.aagt.org>](http://www.aagt.org)
- Association for Applied Psychotherapy and Biofeedback**
10200 W 44th Ave, Ste. 304
Wheat Ridge, CO 80033-2840
(303) 422-8436
[<http://www.aapb.org>](http://www.aapb.org)
- Association of Birth Defect Children**
3526 Emerywood Lane
Orlando, FL 32806
(305) 859-2821
- Association for the Bladder Extrophy Community**
PO Box 1472
Wake Forest, NC 27588-1472
(919) 624-9447
[<http://www.bladderextrophycom/support.htm>](http://www.bladderextrophycom/support.htm)
- Association for the Care of Children's Health (ACCH)**
7910 Woodmont Ave, Ste. 300
Bethesda, MD 20814
(800) 808-2224
- Association for the Cure of Cancer of the Prostate (CaPCure)**
1250 Fourth St, Ste. 360
Santa Monica, CA 90401
(800) 757-CURE
[<http://www.capecure.org>](http://www.capecure.org)
- Association for Glycogen Storage Disease**
PO Box 896
Durant, IA 52747-9769
(319) 785-6038
- Association for Neuro-Metabolic Disorders**
5223 Brookfield Lane
Sylvania, OH 43560-1809
(419) 885-1497
- Association of SIDS and Infant Mortality Programs**
Minnesota SID Center Children's Hospitals and Clinics
2525 Chicago Ave S
Minneapolis, MN 55404
(612) 813-6285
[<http://www.asip1.org>](http://www.asip1.org)
- Association for Spina Bifida and Hydrocephalus**
42 Park Rd
Peterborough PE1 2UQ
United Kingdom
0173 355 5988
Fax: 017 3355 5985
postmaster@asbah.org
[<http://www.asbahdemon.co.uk>](http://www.asbahdemon.co.uk)
- Asthma and Allergy Foundation of America**
1233 20th St NW, Ste. 402
Washington, DC 20036
(800) 727-8462
[<http://www.aafa.org>](http://www.aafa.org)
- Aston Training Center**
P O Box 3568
Incline Village, NV 89450
(775) 831-8228
Astonpat@aol.com
[<http://www.aston-patterning.com>](http://www.aston-patterning.com)
- Audiology Awareness Campaign**
3008 Millwood Ave

Columbia SC 29205
(800) 445-8629

Auditory-Verbal International
2121 Eisenhower Ave, Ste. 402
Alexandria, VA 22314
(703) 739-1049
<avi@auditory-verbal.org>
<http://www.auditory-verbal.org/contact.htm>

Autism Research Institute
4182 Adams Ave
San Diego, CA 92116
(619) 281-7165

Autism Society of America
7910 Woodmont Ave, Ste. 300
Bethesda, MD 20814-3067
(800) 328-8476
<http://www.autism-society.org>

Autism Network International
PO Box 448
Syracuse, NY 13210

Ayurveda Holistic Center
Bayville
Long Island, NY
(516)759-7731
mail@Ayurvedahccom
<http://www.Ayurvedahc.com>

Ayurvedic Institute
11311 Menaul NE
Albuquerque, NM 87112
(505)291-9698
info@Ayurveda.com
<http://www.Ayurveda.com>

Ayurvedic and Naturopathic Medical Clinic
10025 NE 4th St
Bellevue, WA 98004
(206)453-8022

B

Bastyr University of Natural Health Sciences
144 NE 54th St
Seattle, WA 98105
(206) 523-9585

Baylor College of Medicine
1 Baylor Plaza
Houston, TX 77030
(713) 798-4951
<http://publicbcm.edu>

Beck Institute
GSB Building City Line and Belmont Aves, Ste. 700
Bala Cynwyd, PA 19004-1610
(610) 664-3020
<http://www.beckinstitute.org>

Behcet's Organization Worldwide Head Office
PO Box 27
Watchet Somerset TA23 OYJ
United Kingdom
<http://www.behcets.org>

Bell's Palsy Research Foundation
9121 E Tanque Verde, Ste. 105-286
Tucson, AZ 85749
(520) 749-4614

Beryllium Support Group
PO Box 2021
Broomfield, CO 80038-2021
(303) 412-7065
<http://www.dimensioal.com/~mhj>

Better Hearing Institute
515 King St, Ste. 420
Alexandria, VA 22314
(703) 684-3391

Biofeedback Certification Institute of America
10200 W 44th Ave, Ste. 310
Wheat Ridge, CO 80033
(303) 420-2902

Bladder Health Council American Foundation for Urologic Disease
300 West Pratt St, Ste. 401
Baltimore, MD 21201
(800) 242-2383
(410) 727-2908

Brain Aneurysm Foundation Inc
66 Canal St
Boston, MA 02114
(617) 723-3870
<http://neurosurgery.mgh.harvard.edu/baf>

Brain Injury Association of America
105 North Alfred St
Alexandria, VA 22314
(800) 444-6443
<http://www.biausa.org>

Brain Tumor Information Services
Box 405, Room J341
University of Chicago Hospitals
5841 S Maryland Ave
Chicago, IL 60637
(312) 684-1400

British Leprosy Relief Association LEPRA
Fairfax House
Causton Road
Colchester Essex CO1 1PU
United Kingdom

British Coalition of Heritable Disorders of Connective Tissue
Rochester House
5 Aldershot Road
Fleet Hampshire GU13 9NG

United Kingdom
(012) 52-810472

C

California Colon Hygienist Society
333 Miller Ave, Ste. 1
Mill Valley, CA 94941
(415) 383-7224

Canadian Society for Mucopolysaccharide and Related Diseases
PO Box 64714
Unionville ONT L3R-0M9
Canada
(905) 479-8701
(800) 667-1846
<http://www.mpssociety.ca>

Canadian HIV/AIDS Clearinghouse
1565 Carling Ave, Ste. 400
Ottawa ON K1Z 8R1
Canada
(877) 999-7740
<http://www.clearinghousecpa.ca/clearinghouse_e.htm>

Canadian MEN Society
PO Box 100
Meola Saskatchewan SOM 1XO
Canada
(306) 892-2080

Canadian 22q Group
320 Cote St Antoine West
Montreal Quebec H3Y 2J4
Canada

Cancer Care Inc
275 Seventh Ave
New York, NY 10001
(800) 813-HOPE
<http://www.cancercare.org>

Cancer Group Institute
1814 NE Miami Gardens Dr
North Miami Beach, FL 33179
(305) 651-5070
<http://www.cancergroup.com/em19.html>

Cancer Research Institute (National Headquarters)
681 Fifth Ave
New York, NY 10022
(800) 992-2623
<http://www.cancerresearch.org>

Cancer Prevention Coalition
2121 West Taylor St
Chicago, IL 60612
(312) 996-2297
<http://www.preventcancer.com>

Cancer Group Institute
17620 9th Ave NE

- North Miami Beach, FL 33162**
(305) 493-1980
<http://www.cancergroup.com>
- Cancer Hope Network**
Ste. A Two North Rd
Chester, NJ 07930
(877) HOPENET
<http://www.canceropenetwork.org>
- Cancer Information Service National Cancer Institute**
Building 31, Room 10A19
9000 Rockville Pike
Bethesda, MD 20892
(800)4-CANCER
<http://www.nci.nih.gov/cancerinfo/index.html>
- CancerNet**
National Cancer Institute 9000 Rockville Pike
Bldg 31, Rm 10A16
Bethesda, MD 20892
(800) 422-6237
<http://www.cancer.gov>
- Carcinoid Cancer Foundation Inc**
1751 York Ave
New York, NY 10128
(212) 722-3132
<http://www.carcinoid.org>
- Cardiac Arrhythmia Research and Education Foundation (CARE)**
2082 Michelson Dr #301
Irvine, CA 92612
(800) 404-9500
<http://www.longqt.com>
- Celiac Disease Foundation**
13251 Ventura Blvd, Ste. 1
Studio City, CA 91604-1838
(818) 990-2354
<http://www.cdf@celiac.org>
- Celiac Sprue Association/United State of America (CSA/USA)**
PO Box 31700
Omaha, NE 68131-0700
(402) 558-0600
- Center for Cell and Gene Therapy**
Baylor College of Medicine
1102 Bates St, Ste. 1100
Houston, TX 77030-2399
(713) 770-4663
<http://www.bcm.edu/genetherapy>
- Center for Devices and Radiological Health**
United States Food and Drug Administration
1901 Chapman Ave
Rockville, MD 20857
(301) 443-4109
<http://www.fda.gov/cdrh>
- Center for Fertility and In Vitro Fertilization Loma Linda University**
11370 Anderson St
Loma Linda, CA 92354
(909) 796-4851
<http://www.llu.edu/llumc/fertility>
- Center for Holistic Urology**
161 Fort Washington Ave
New York, NY 10032
(212) 305-0347
<http://www.holisticurology.com>
- Center for Mind/Body Medicine**
PO Box 1048
La Jolla, CA 92038
(619)794-2425
- Center for Mindfulness**
University of Massachusetts Medical Center
55 Lake Ave North
Worcester, MA 01655
(508) 856-2656
<http://www.umassmed.edu/cfm>
- Center for Occupational and Environmental Medicine**
7510 Northforest Dr
North Charleston, SC 29420
(843) 572-1600
<http://www.coem.com>
- Center for the Study of Anorexia and Bulimia**
1 W 91st St
New York, NY 10024
(212) 595-3449
- Center for Taste and Smell Disorders**
University of Colorado Health Sciences Center
4200 E Ninth Ave
Denver, CO 80262
(303) 315-5660
<http://www.hsccolorado.edu>
- Centers for Disease Control and Prevention**
1600 Clifton Rd NE
Atlanta, GA 30333
(800) 311-3435
(404) 639-3311
<http://www.cdc.gov>
- Central Institute for the Deaf**
Washington University
St Louis MO
<http://cidmacwustl.edu>
- Chalice of Repose Project at St Patrick Hospital**
312 East Pine St
Missoula, MT 59802
(406) 329-2810
Fax: (406) 329-5614
<http://www.saintpatrick.org/chalice/>
- Charcot Marie Tooth Association (CMTA)**
2700 Chestnut Parkway
Chester, PA 19013
(610) 499-9264
(800) 606-CMTA
Fax: (610) 499-9267
cmtassoc@aol.com
<http://www.charcot-marie-tooth.org>
- Child Abuse Prevention Center of Utah**
2955 Harrison Blvd #102
Ogden UT 84403
(888) 273-0071
- Childbirth Education Foundation**
PO Box 5
Richboro, PA 18954
(215) 357-2792
- Children Living with Inherited Metabolic Diseases**
The Quadrangle Crewe Hall Weston Rd
Crewe Cheshire CW1-6UR
United Kingdom
127 025 0221
Fax: 0870-7700-327
<http://www.climb.org.uk>
- Children's Gaucher Research Fund**
PO Box 2123
Granite Bay, CA 95746-2123
(916) 797-3700
Fax: (916) 797-3707
<http://www.childrensgaucher.org>
- Children's Blood Foundation**
333 East 38th St Room 830
New York, NY 10016-2745
(212) 297-4336
cfg@nyhmedcornell.edu
- Children's Brittle Bone Foundation**
7701 95th St
Pleasant Prairie, WI 53158
(847) 433-498
<http://www.cbbf.org>
- Children's Health Information Network**
1561 Clark Dr
Yardley, PA 19067
(215) 493-3068
<http://www.tchin.org>
- Children's Organ Transplant Association Inc**
2501 COTA Dr
Bloomington, IN 47403
(800) 366-2682
<http://www.cota.org>
- Children's PKU Network (CPN)**
3790 Via De La, VA lle, Ste. 120
Del Mar, CA 92014
(800) 377-6677
<http://www.pkunetwork.org/>

- Chinese National Chi Kung Institute**
PO Box 31578
San Francisco, CA 94131
(800) 824-2433
- Chromosome Deletion Outreach Inc**
PO Box 724
Boca Raton, FL 33429-0724
(888) 236-6680
- Chromosome 18 Registry & Research Society**
6302 Fox Head
San Antonio, TX 78247
(210) 657-4968
[<http://www.chromosome18.org>](http://www.chromosome18.org)
- Chronic Granulomatous Disease Association**
2616 Monterey Road
San Marino, CA 91108-1646
(818) 441-4118
- Chronic Pain Outreach**
822 Wycliff Ct
Manassas, VA 22110
(703) 368-7357
- CMT International**
1 Springbank Dr
St Catherine's ONT L2S2K1
Canada
(905) 687-3630
[<http://www.cmtint.org>](http://www.cmtint.org)
- Cocaine Anonymous**
6125 Washington Blvd, Ste. 202
Culver City, CA 90232
(800) 347-8998
- Cochlear Implant Club International**
5335 Wisconsin Ave NW, Ste. 440
Washington, DC 20015-2052
(202) 895-2781
[<http://www.cici.org>](http://www.cici.org)
- College of American Pathologists**
325 Waukegan Road
Northfield, IL 60093
(800) 323-4040
[<http://www.cap.org>](http://www.cap.org)
- College of Maharishi Ayur-Ved Maharishi International University**
1000 4th St
Fairfield, IA 52557
(515) 472-7000
- Coma Recovery Association Inc**
570 Elmont Rd, Ste. 104
Elmont, NY 11003
(516) 355-0951
- Compassionate Friends**
PO Box 3696
Oak Brook, IL 60522
(877) 969-0010
[<http://www.compassionatefriends.org>](http://www.compassionatefriends.org)
- Congenital Heart Anomalies Support Education and Resources (CHASER)**
2112 North Wilkins Rd
Swanton, OH 43558
(419) 825-5575
[<http://www.csun.edu/~hfmth006/chaser>](http://www.csun.edu/~hfmth006/chaser)
- Congenital Heart Disease Information and Resources**
1561 Clark Dr
Yardley, PA 19067
[<http://www.tchin.org>](http://www.tchin.org)
- Congenital Nevus Support Group**
1400 South Joyce St
Number C-1201
Arlington, VA 22202
(703) 920-3249
- Cooley's Anemia Foundation Inc**
129-09 26th Ave #203
Flushing, NY 11354
(800) 522-7222
(718) 321-2873
[<http://www.thalassemia.org>](http://www.thalassemia.org)
- Council for Homeopathic Certification**
PO Box 157
Corte Madera, CA 94976
- Cri du Chat Society**
Dept of Human Genetics
Box 33, MCV Station
Richmond, VA 23298
(804) 786-9632
- Crohn's and Colitis Foundation of America Inc**
386 Park Ave South
17th Floor
New York, NY 10016-8804
(800) 932-2423
- Cystic Fibrosis Foundation**
6931 Arlington Road
Bethesda, MD 20814
(800) 344-4823
[<http://www.cff.org>](http://www.cff.org)
- Cystinuria Support Network**
21001 NE 36th St
Redmond, WA 98053
(425) 868-2996
[<http://www.cystinuria.com>](http://www.cystinuria.com)
- D**
- Deafness Research Foundation**
1225 I St NW
No 500
Washington, DC 20005
- Depression After Delivery (DAD)**
PO Box 1282
- Morrisville, PA 19067**
(800) 944-4773
- Dermatology College of Medicine**
University of Iowa
200 Hawkins Dr
Iowa City, IA 52242
(319) 356-2274
[<http://traydermatologyuiowa.edu>](http://traydermatologyuiowa.edu)
- Dermatomyositis and Polymyositis Support Group**
146 Newtown Road
Southampton SO2 9HR
United Kingdom
- Digestive Disease National Coalition**
507 Capitol Court NE, Ste. 200
Washington, DC 20003
(202) 544-7497
[<http://www.ddnc.org>](http://www.ddnc.org)
- Digestive Health Initiative**
7910 Woodmont Ave #914
Bethesda, MD 20814
(800) 668-5237
[<http://www.gastro.org/dhi.html>](http://www.gastro.org/dhi.html)
- Divers Alert Network**
The Peter B Bennett Center
6 West Colony Place
Durham, NC 27705
(800) 446-2671
[<http://www.diversalertnetwork.org>](http://www.diversalertnetwork.org)
-
- E**
- Ear Foundation**
1817 Patterson St
Nashville, TN 37203
(800) 545-4327
[<http://www.earfoundation.org>](http://www.earfoundation.org)
- Eating Disorder Awareness & Prevention Inc**
603, Stewart St, Ste. 803
Seattle, WA 98101
(206) 382-3587
- Edward Bach Centre**
Mount Vernon Bakers Lane
Sotwell Oxon OX10 OPX
United Kingdom
centre@bachcentre.com
[<http://www.bachcentre.com>](http://www.bachcentre.com)
- Elhers-Danlos National Foundation**
6399 Wilshire Blvd, Ste. 203
Los Angeles, CA 90048
(323) 651-3038
Fax: (323) 651-1366
[<http://www.ednf.org>](http://www.ednf.org)
- Ehlers-Danlos Support Group - UK**
PO Box 335
Farnham Surrey GU10 1XJ

- United Kingdom**
01252 690 940
<<http://www.atvndirect.co.uk>>
- Emphysema Anonymous Inc**
PO Box 3224
Seminole, FL 34642
(813)391-9977
- Endocrine Society**
4350 East West Highway, Ste. 500
Bethesda, MD 20814-4410
(301) 941-0200
Fax: (301) 941-0259
endostaff@endo-society.org
- Endometriosis Association International Headquarters**
8585 North 76th Place
Milwaukee, WI 53223
(800) 992-3636
<<http://EndometriosisAssn.org>>
- Environmental Health Center**
1025 Connecticut Ave NW
Washington, DC 20036
(202) 293-2270
- Epilepsy Concern International Service Group**
1282 Wynnewood Dr
West Palm Beach, FL 33417
(407) 683-0044
- Epilepsy Foundation of America**
4351 Garden City Dr, Ste. 406
Landover, MD 20785-2267
(301) 459-3700
(800) 332-1000
<<http://www.epilepsysfoundation.org>>
- ERIC Clearinghouse on Assessment and Evaluation**
1131 Shriner Laboratory
Bldg 075
University of Maryland
College Park, MD 20742
(800) 464-3742
<<http://www.ericae.net>>
- Extracorporeal Life Support Organization**
1327 Jones Dr, Ste. 101
Ann Arbor MI 48105
(734) 998-6600
<<http://www.elsomedumich.edu>>
- EyesOnThePrizeOrg**
446 S Anaheim Hills Road #108
Anaheim Hills, CA 92807
<<http://www.eyesontheprize.org>>
-
- Familial Polyposis Registry**
Department of Colorectal Surgery
Cleveland Clinic Foundation
- 9500 Euclid Ave**
Cleveland, OH 44195-5001
(216) 444-6470
- Family Caregiver Alliance**
425 Bush St, Ste. 500
San Francisco, CA 94108
(800) 445-8106
<<http://www.caregiver.org>>
- Fasting Center International**
32 West Anapurna St #360
Santa Barbara, CA 93101
<<http://www.fasting.com>>
- Federal Drug Administration**
5600 Fishers Lane
Rockville, MD 20857
(800) 532-4440
<<http://www.fda.gov>>
- Federation for Children With Special Needs**
1135 Tremont St, Ste. 420
Boston, MA 02120
(617) 236-7210
<<http://www.fcsn.org>>
- Federation of Feminist Women's Health Centers**
1469 Humboldt Rd, Ste. 200
Chico, CA 96928
(530) 891-1911
- Feldenkrais Guild of North America**
3611 SW Hood Ave, Ste. 100
Portland, OR 97201
(800) 775-2118
(503) 221-6612
Fax: (503) 221-6616
<<http://www.feldenkrais.com>>
- Female Sexual Medicine Center**
UCLA Medical Center
924 Westwood Blvd, Ste. 520
Los Angeles, CA 90024
(310) 825-0025
<<http://www.newshe.com>>
- Fetal Alcohol Syndrome Family Resource Institute**
PO Box 2525
Lynnwood, WA 98036
(253) 531-2878
(800) 999-3429
<<http://www.fetalalcoholsyndrome.org>>
- 5p- Society**
7108 Katella Ave. #502
Stanton, CA 90680
(888) 970-0777
<<http://www.fivepminus.org>>
- Florida Institute of Psychophysical Integration: Quantum Balance**
5837 Mariner Dr
Tampa, FL 33609-3411
(813) 186-2273
- Flower Essence Society**
PO Box 459
Nevada City, CA 95959
(800) 736-9222 (US & Canada)
Fax: (530) 265-0584
mail@flowersociety.org
<<http://www.flowersociety.org>>
- Food and Drug Administration**
Office of Inquiry and Consumer Information
5600 Fisher Lane
Room 12-A-40
Rockville, MD 20857
(301) 827-4420
<<http://www.fda.gov/fdahomepage.html>>
- Food and Nutrition Information Center**
10301 Baltimore Blvd
Room 304
Beltsville, MD 20705-2351
<<http://www.nalusda.gov/fnic>>
- Foundation Fighting Blindness**
Executive Plaza I, Ste. 800
11350 McCormick Road
Hunt Valley, MD 21031-1014
(888) 394-3937
<<http://www.blindness.org>>
- Foundation for Ichthyosis and Related Skin Types**
650 N Cannon Ave, Ste. 17
Lansdale, PA 19446
(215) 631-1411
(800) 545-3286
Fax: (215) 631-1413
<<http://www.scalyskin.org>>
- Frontier's International Vitiligo Foundation**
4 Rozina Court
Owings Mills, MD 21117
(301) 594-0958
-
- G**
- Gamblers Anonymous International Service Office**
PO Box 17173
Los Angeles, CA 90017
(213) 386-8789
Fax: (213) 386-0030
<<http://www.gamblersanonymous.org>>
- Gay and Lesbian Medical Association**
459 Fulton St, Ste. 107
San Francisco, CA 94102
(415) 225-4547
<<http://www.glma.org>>

Gluten Intolerance Group
PO Box 23053
Seattle, WA 98102-0353
(206) 325-6980

GriefNet
PO Box 3272
Ann Arbor MI 48106
<http://rivendell.org>

Guide Dogs for the Blind
PO Box 1200
San Rafael, CA 94915
(415) 499-4000

Guillain-Barré Syndrome Foundation International
PO Box 262
Wynnewood, PA 19096
(610) 667-0131
(610) 667-0131
<http://www.webmast.com/gbs>

Gynecologic Cancer Foundation
401 North Michigan Ave
Chicago, IL 60611
(800) 444-4441
<http://www.wcn.org>

H

Hairy Cell Leukemia Research Foundation
2345 County Farm Lane
Schaumburg, IL 60194
(800) 693-6173

HCF Nutrition Research Foundation Inc
PO Box 22124
Lexington, KY 40522
(606) 276-3119

Head Injury Hotline
PO Box 84151
Seattle, WA 98124
(206) 621-8558
<http://www.headinjury.com>

Head Trauma Support Project Inc
2500 Marconi Ave, Ste. 203
Sacramento, CA 95821
(916) 482-5770

Health Services and Resources Administration
Division of Organ Transplantation
Room 11A-22
5600 Fishers Lane
Rockville, MD 20857

Hear Now
9745 E Hampden Ave, Ste. 300
Denver, CO 80231
(800) 648-HEAR
(202) 651-5258

Hearing Industries Association
1800 M St NW
Washington, DC 20036
(202) 651-5258

Hearing Loss Link
2600 W Peterson Ave, Ste. 202
Chicago, IL 60659
(312) 743-1032
(312) 743-1007 (TDD)

Heimlich Institute
PO Box 8858
Cincinnati, OH 45208
<http://www.heimlichinstitute.org/index.htm>

Hellerwork
406 Berry St
Mt Shasta, CA 96067
(530) 926-2500
<http://www.hellerwork.com>

Hemochromatosis Foundation Inc
PO Box 8569
Albany, NY 12208-0569
(518) 489-0972
skleiner@shivahuntercuny.edu
<http://www.hemochromatosis.org>

Hepatitis B Foundation
101 Greenwood Ave, Ste. 570
Jenkintown, PA 19046
(215) 884-8786
info@hepb.org

Herb Research Foundation
1007 Pearl St, Ste. 200
Boulder, CO 80302
(303) 449-2265
<http://www.herbs.org>

Hermansky-Pudlak Syndrome Network Inc
One South Road
Oyster Bay, NY 11771-1905
(800) 789-9477
appell@theonramp.net

Hirshberg Foundation for Pancreatic Cancer Research
375 Homewood Rd
Los Angeles, CA 90049
(310) 472-6310
<http://www.pancreatic.org>

Histiocytosis Association of America
302 North Broadway
Pitman, NJ 08071
(800) 548-2758 (USA and Canada)
<http://www.histio.org>

Homeopathic Educational Services
2124B Kittredge St
Berkeley, CA 94704
(510) 649-0294
Fax: (510) 649-1955

Hospice Foundation of America
2001 S St NW, Ste. 300
Washington, DC 20009
(800) 854-3402
<http://www.hospicefoundation.org>

Hospicelink
Hospice Education Institute
190 Westbrook Rd
Essex, CT 06426-1510
(800) 331-1620
<http://www.hospiceworld.com>

Human Growth Foundation
997 Glen Cove Ave
Glen Head, NY 11545
(800) 451-6434
<http://www.hgfound.org>

Hydrocephalus Foundation Inc
(HyFI) 910 Rear Broadway
Saugus, MA 01906
(781) 942-1161
HyFI1@netscape.net
<http://www.hydrocephalus.org>

Hypoglycemia Association Inc
18008 New Hampshire Ave
PO Box 165
Ashton, MD 20861-0165

Hypospadias Association of America
4950 S Yosemite St
Box F2-156
Greenwood Village, CO 80111
hypospadiasassn@yahoo.com
<http://www.hypospadias.net>

I

IgA Nephropathy Support Network
964 Brown Ave
Huntington, Valley, PA 19006
(215) 663-0536

Immune Deficiency Foundation
25 W Chesapeake Ave, Ste. 206
Towson, MD 21204
(800) 296-4433
<http://www.primaryimmune.org>

Impotence Institute of America
Impotents Anonymous
10400 Little Patuxent Parkway, Ste. 485
Columbia, MD 21044-3502
(800) 669-1603

INFOLEP Leprosy Information Services
Postbus 950051090 HA
Amsterdam Netherlands
Infolep@antenna.nl

Inherited High Cholesterol Foundation
410 Chipeta Way

- Room 167**
Salt Lake City UT 84104
(888) 244-2465
- Insight Meditation Society**
1230 Pleasant St
Barre, MA 01005
(978) 355-4378
Fax: (978) 355-6398
<http://www.dharma.org>
- Institute for Families with Blind Children**
PO Box 54700, Mail Stop 111
Los Angeles, CA 90054-0700
(213) 669-4649
- Institute for Preventative Sports Medicine**
PO Box 7032
Ann Arbor, MI 48107
(313) 434-3390
<http://www.ipsm.org>
- International Association of Enterostomal Therapy**
27241 La Paz Road, Ste. 121
Laguna Niguel, CA 92656
(714) 476-0268
- International Association of Infant Massage**
PO Box 1045
Oak View, CA 93022
- International Association of Laryngectomees (IAL)**
7440 North Shadeland Ave, Ste. 100
Indianapolis, IN 46250
<http://www.larynxlink.com>
- International Association for Medical Assistance to Travelers (IAMAT)**
417 Center St
Lewistown, NY 14092
(716) 754-4883
- International Association of Parents and Professionals for Safe Alternatives in Childbirth**
Rte 1, Box 646
Marble Hill, MO 63764
(314) 238-2010
- International Association of Reiki Professionals**
PO Box 481
Winchester, MA 01890
<http://www.iarp.org>
- International Association of Yoga Therapists (IAYT)**
4150 Tivoli Ave
Los Angeles, CA 90066
- International Bio-Oxidative Medicine Foundation (IBOMF)**
PO Box 891954
Oklahoma City OK 73109
- (405) 634-7855**
Fax: (405) 634-7320
- International Childbirth Education Association**
PO Box 20048
Minneapolis, MN 55420
(612) 854-8660
- International Chi Kung/Qi Gong Directory**
2730 29th St
Boulder, CO 80301
(303) 442-3131
- International Cesarean Awareness Network**
1304 Kingsdale Ave
Redondo Beach, CA 90278
(310) 542-6400
- International Council for the Control of Iodine Deficiency Disorders**
43 Circuit Road
Chester Hill, MA 02167
(207) 335-2221
<http://www.tulane.edu/~icec/icciddd.html>
- International College of Applied Kinesiology**
PO Box 905
Lawrence KS 66044-9005
(913) 542-1801
- International Colour Vision Society: Forschungsstelle fuer Experimentelle Ophthalmologie**
Roentgenweg 11
Tuebingen D-72076
Germany
<http://orlaboptomunsw.edu.au/ICVS>
- International Council for Medical and Clinical Therapists**
7361 McWhorter Place, Ste. 300
Annandale, VA 22003-5469
<http://www.ultradepth.com/ICMCT.htm>
- International DiGeorge/VCF Support Network**
c/o Family Voices of New York
46 1/2 Clinton Ave
Cortland, NY 13045
(607) 753-1250
- International Eye Foundation**
7801 Norfolk Ave
Bethesda, MD 20814
(301) 986-1830
- International Foundation for Functional Gastrointestinal Disorders**
PO Box 17864
Milwaukee, WI 53217
(888) 964-2001
<http://www.iffgd.org>
- International Foundation for Homeopathy**
2366 Eastlake Ave East
#301
Seattle, WA 98102
(425)776-4147
- International Institute of Infant Massage**
605 Bledsoe Rd NW
Albuquerque, NM 87107
(505) 341-9381
Fax: (505) 341-9386
<http://www.infantmassage.com>
- International Institute of Reflexology**
PO Box 12642
St Petersburg, FL 33733-2642
(727) 343-4811
Fax: (727) 381-2807
fteflex@concentric.net
- International Lactation Consultants Association**
201 Brown Ave
Evanston, IL 60202
(708) 260-8874
- International Lesch-Nyhan Disease Association**
114 Winchester Way
Shamong, NJ 08088-9398
(215) 677-4206
- International Medical and Dental Hypnotherapy Association**
4110 Edgeland, Ste. 800
Royal Oak MI 48073-2285
<http://www.infinityinst.com>
- International Myopia Prevention Association**
RD No 5, Box 171
Ligonier, PA 15658
(412) 238-2101
- International NLP Trainers Association Ltd**
Coombe House Mill Road
Fareham Hampshire PO16 0TN
United Kingdom
(044) 01489 571171
- International Ozone Association Ind Pan American Group**
31 Strawberry Hill Ave
Stamford, CT 06902
(203) 348-3542
Fax: (203) 967-4845
- International Polio Network**
4207 Lindell Blvd, Ste. 110
St Louis, MO 63108-2915
(314) 534-0475
- International Rett Syndrome Association**
9121 Piscataway Road, Ste. 2B

Clinton, MD 20735
 (800) 818-7388
[<http://www.rettsyndrome.org>](http://www.rettsyndrome.org)

International School of Shiatsu
 10 South Clinton St
 Doylestown, PA 18901

International Tremor Foundation
 7046 West 105th St
 Overland Park KS 66212
 (913) 341-3880

Intersex Society
 PO Box 31791
 San Francisco, CA 94131

Intestinal Health Institute
 4427 East Fifth St
 Tucson, AZ 85711
 (520) 325-9686
info@sheilas.com
[<http://www.sheilas.com>](http://www.sheilas.com)

Irish Raynaud's and Scleroderma Society
 PO Box 2958
 Foxrock Dublin 18
 Ireland
 (01) 235 0900
irss@indigo.ie

Iron Disorders Institute Inc
 PO Box 3021
 Greenville SC 29602
 (864) 241-0111
irondis@aol.com
[<http://www.irondisorders.org>](http://www.irondisorders.org)

Iron Overload Diseases Association Inc
 433 Westwind Dr North
 Palm Beach, FL 33408
 (561) 840-8512
iod@ironoverload.org

J

Juvenile Diabetes Foundation
 120 Wall St 19th Floor
 New York, NY 10005
 (800) 533-2873
[<http://www.jdf.org>](http://www.jdf.org)

K

Kids with Heart
 1578 Careful Dr
 Green Bay, WI 54304
 (800) 538-5390
[<http://www.execpc.com/~kdswhrt>](http://www.execpc.com/~kdswhrt)

Klinefelter Syndrome and Associates Inc
 PO Box 119

Roseville, CA 95678-0119
 (916) 773-2999
 (888) 999-9428
 Fax: (916) 773-1449
ksinfo@gene.org
[<http://www.genetic.org/ks>](http://www.genetic.org/ks)

Klinefelter's Organization
 PO Box 60
 Orpington BR68ZQ
 United Kingdom
[<http://hometownal.com/KSCUK/index.htm>](http://hometownal.com/KSCUK/index.htm)

Komen Foundation
 5005 LBJ Freeway, Ste. 250
 Dallas, TX 75244
 (972) 855-1600
[<http://www.komen.org>](http://www.komen.org)

L

LaLeche League International
 1400 N Meacham Rd
 Schaumburg, IL 60173-4048
 (800) 525-3243
[<http://www.lalechelleague.org>](http://www.lalechelleague.org)

Late Onset Tay-Sachs Foundation
 1303 Paper Mill Road
 Erdenheim, PA 19038
 (800) 672-2022

League for the Hard of Hearing
 71 West 23rd St
 New York, NY 10010-4162
 (212) 741-7650
[<http://www.lhh.org>](http://www.lhh.org)

Learning Disabilities Association of America
 4156 Library Road
 Pittsburgh, PA 15234
 (412) 341-1515
[<http://www.ldanatl.org>](http://www.ldanatl.org)

Lesch-Nyhan Syndrome Registry
 New York University School of Medicine
 Department of Psychiatry
 550 First Ave
 New York, NY 10012
 (212) 263-6458

Leukaemia Research Fund
 43 Great Ormond St
 London WC1N 3JJ
 United Kingdom
 (020) 7405-0101
<http://dSPACE.dialipex.com/lrf-/>

Leukemia Society of America Inc
 600 Third Ave
 New York, NY 10016
 (800) 955 4572
[<http://www.leukemia.org>](http://www.leukemia.org)

Lighthouse National Center for Education
 111 E 59th St
 New York, NY 10022
 (800) 334-5497
[<http://www.lighthouse.org>](http://www.lighthouse.org)

Lighthouse National Center for Vision and Aging
 111 E 59th St
 New York, NY 10022
 (800) 334-5497
[<http://www.lighthouse.org>](http://www.lighthouse.org)

Little People of America Inc
 National Headquarters
 PO Box 745
 Lubbock, TX 79408
 (806) 737-8186
 (888) LPA-2001
lpadatabase@juno.com
[<http://www.lpaonline.org>](http://www.lpaonline.org)

Lupus Foundation of America
 1300 Piccard Dr, Ste. 200
 Rockville, MD 20850
 (800) 558-0121
[<http://www.lupus.org>](http://www.lupus.org)

Lyme Disease Network of New Jersey Inc
 43 Winton Road
 East Brunswick, NJ 08816
[<http://www.lymenet.org>](http://www.lymenet.org)

Lymphoma Research Foundation
 8800 Venice Blvd, Ste. 207
 Los Angeles, CA 90034
 (310) 204 7040

M

March of Dimes Birth Defects Foundation
 1275 Mamaroneck Ave
 White Plains, NY 10605
 (888) 663-4637
resourcecenter@modimes.org
[<http://www.modimes.org>](http://www.modimes.org)

Massachusetts College of Emergency Physicians (MACEP)
 P O Box 296
 Swansea, MA 02777
 (508) 643-0117
 Fax: (508) 643-0141

Massachusetts General Hospital
 Functional and, Ste.reotactic Neurosurgery Cingulotomy Unit
 Fruit St
 Boston, MA 02114
 (617) 726-2000
[<http://neurosurgerymghharvard.edu/cingulot.htm>](http://neurosurgerymghharvard.edu/cingulot.htm)

- Ménière's Network**
1817 Patterson St
Nashville, TN 37203
(800) 545-4327
<<http://www.earfoundation.org>>
- Meningitis Foundation of America**
7155 Shadeland Station, Ste. 190
Indianapolis, IN 46256-3922
(800) 668-1129
<<http://www.musa.org/welcome.htm>>
- Metabolic Information Network**
PO Box 670847
Dallas, TX 75367-0847
(214) 696-2188
(800) 945-2188
- Micronutrient Initiative**
(c/o International Development Research Centre)
250 Albert St Ottawa Ontario
Canada K1G 3H9
(613) 236-6163, ext 2050
<<http://www.idrc.ca/mi/index.htm>>
- Midlife Women's Network**
5129 Logan Ave S
Minneapolis, MN 55419
(800) 886-4354
- Midwest Heart Specialists**
Physician Office Building
3825 Highland Ave
Tower 2, Ste. 400
Downers Grove, IL 60515
(630) 719-4799
<<http://www.midwestheart.com>>
- Milne Institute Inc**
PO Box 2716
Monterey, CA 93942-2716
(831) 649-1825
Fax: (831) 649-1826
<<http://www.milneinstitute.com>>
milneinst@aol.com
- Mind-Body Medical Institute**
Beth Israel Deaconess Medical Center
One Deaconess Road
Boston, MA 02215
(617) 632-9525
<<http://www.mindbodyharvard.edu>>
- Mine Safety and Health Administration**
4015 Wilson Blvd
Arlington, VA 22203
(703) 235-1910
<<http://www.msha.gov>>
- Mommies Enduring Neonatal Death (MEND)**
PO Box 1007
Coppell, TX 75067
(972) 459-2396
(888) 695-6363
<http://www.mend.org/home_index.asp>
- Multiple Myeloma Research Foundation**
11 Forest St
New Canaan, CT 06840
(203) 972-1250
<<http://www.multiplemyeloma.org>>
- Muscular Dystrophy Association**
3300 East Sunrise Dr
Tucson, AZ 85718
(520) 529-2000
(800) 572-1717
<<http://www.mdausa.org>>
- Myasthenia Gravis Foundation of America**
222 S Riverside Plaza, Ste. 1540
Chicago, IL 60606
(800) 541-5454
<<http://www.medunc.edu>>
- Myelin Project Headquarters**
2001 Pennsylvania Ave NW, Ste. 225
Washington, DC 20006-1850
(202) 452-8994
<<http://www.myelin.org>>
- Myelodysplastic Syndromes Foundation**
464 Main St
PO Box 477
Crosswicks, NJ 08515
(800) MDS-0839
<<http://www.mds-foundation.org>>
- Myopia International Research Foundation**
1265 Broadway
Room 608
New York, NY 10001
(212) 684-2777
- Myositis Association of America**
600-D University Blvd
Harrisonburg, VA 22801
(540) 433-7686
<<http://www.myositis.org>>
-
- N**
- Nar-Anon Family Group Headquarters Inc**
PO Box 2562
Palos Verdes Peninsula, CA 90274
(310) 547-5800
- Narcolepsy Network**
PO Box 42460
Cincinnati, OH 45242
(973) 276-0115
- National Adrenal Disease Foundation**
505 Northern Blvd, Ste. 200
Great Neck, NY 11021
(516) 487-4992
- National AIDS Treatment Advocacy Project**
580 Broadway, Ste. 403
New York, NY 10012
(888) 266-2827
<<http://www.natap.org>>
- National Alliance on Alcoholism and Drug Dependence Inc**
12 West 21st St
New York, NY 10010
(212) 206-6770
- National Alliance of Breast Cancer Organizations**
9 East 37th St
10th Floor
New York, NY 10016
(888) 806-2226
Fax: 212-689-1213
<<http://www.nabco.org>>
- National Alliance for Breastfeeding Advocacy**
254 Conant Rd
Weston, MA 02193
(617) 893-3553
- National Alliance of Methadone Advocates (NAMA)**
435 Second Ave
New York, NY 10010
(212) 595-6262
<<http://www.methadone.org>>
- National Alliance for the Mentally Ill (NAMI)**
Colonial Place Three
2107 Wilson Blvd, Ste. 300
Arlington, VA 22201-3042
(800) 950-6264
<<http://www.nami.org>>
- National Alliance for Research on Schizophrenia and Depression**
60 Cutler Mill Road, Ste. 200
Great Neck, NY 11021
(516) 829-0091
<<http://www.mhsource.com>>
- National Animal Disease Center**
Zoonotic Research Unit
2300 Dayton Ave
PO Box 70
Ames, IA 50010
- National Anxiety Foundation**
3135 Custer Dr
Lexington, KY 40517
(606) 272-7166
<<http://www.lexington-on-line.com/naf.html>>
- National Aphasia Association**
156 5th Ave, Ste. 707
New York, NY 10010
(800) 922-4622
<<http://www.aphasia.org>>

- National Association of Anorexia Nervosa and Associated Disorders**
 Box 7
 Highland Park, IL 60035
 (708) 831-3438
- National Association of Cognitive-Behavioral Therapists**
 PO Box 2195
 Weirton WV 26062
 (800) 853-1135
[<http://www.nacbt.org>](http://www.nacbt.org)
- National Association for Continence**
 PO Box 8310
 Spartanburg, SC 29305-8310
 (800) 252-3337
[<http://www.nafc.org>](http://www.nafc.org)
- National Association for the Deaf**
 814 Thayer Ave
 Silver Spring, MD 20910
 (301) 587-1788
 (301) 587-1789 (TDD)
[<http://www.nad.org>](http://www.nad.org)
- National Association of Holistic Aromatherapy**
 836 Hanley Industrial Court
 St Louis, MO 63144
 (888) ASK-NAHA
[<http://www.naha.org>](http://www.naha.org)
- National Association for Proton Therapy**
 7910 Woodmont Ave, Ste. 1303
 Bethesda, MD 20814
 (301) 913-9360
[<http://www.proton-therapy.org/Default.htm>](http://www.proton-therapy.org/Default.htm)
- National Association for Premenstrual Syndrome**
 7 Swift's Court High St
 Seal Kent TN15 0EG
 United Kingdom
 +44 (0) 1732 760011
[<http://www.PMDD.org.uk>](http://www.PMDD.org.uk)
- National Association for Pseudoxanthoma Elasticum**
 3500 East 12th Ave
 Denver, CO 80206
 (303) 355-3866
 Fax: (303) 355-3859
 Pxenape@eStcom
[<http://www.napxe.org>](http://www.napxe.org)
- National Association for the Visually Handicapped**
 22 West 21st St
 New York, NY 10010
 (212) 889-3141
- National Athletic Trainers' Association**
 2952, Stemmons Freeway
 Dallas, TX 75247-6916
- (800) 879-6282
 (214) 637-6282
 Fax: (214) 637-2206
[<http://www.nata.org>](http://www.nata.org)
- National Attention Deficit Disorder Association (ADDA)**
 9930 Johnnycake Ridge Road, Ste. 3E
 Mentor, OH 44060
 (800) 487-2282
[<http://www.add.org>](http://www.add.org)
- National Autism Hotline**
 c/o Autism Services Center
 PO Box 507
 605 Ninth St
 Huntington, WV 25710
 (304) 525-8014
- National Birth Defects Prevention Network**
 Atlanta, GA
 (770) 488-3550
[<http://www.nbdpn.org>](http://www.nbdpn.org)
- National Board for Hypnotherapy and Hypnotic Anaesthesiology**
 7841 West Ludlow Dr, Ste. A
 Peoria, AZ 85381
[<http://www.nbha-medicine.com/index.html>](http://www.nbha-medicine.com/index.html)
- National Breast Cancer Coalition**
 1707 L St NW, Ste. 1060
 Washington, DC 20036
 (800) 622-2838
 Fax: 202-265-6854
[<http://www.natlbcc.org>](http://www.natlbcc.org)
- National Cancer Institute**
 Building 31, Room 10A31
 31 Center Dr
 MSC 2580
 Bethesda, MD 20892-2580
 (800) 422-6237
[<http://www.nci.nih.gov>](http://www.nci.nih.gov)
- National Center for Complementary and Alternative Medicine (National Institutes of Health)**
 PO Box 8218
 Silver Spring, MD 20907-8218
 (888) 644-6226
[<http://nccam.nih.gov>](http://nccam.nih.gov)
- National Center for Homeopathy**
 801 North Fairfax St, Ste. 306
 Alexandria, VA 22134
 (703) 548-7790
- National Center for Learning Disabilities (NCLD)**
 381 Park Ave South, Ste. 1401
 New York, NY 10016
 (410) 296-0232
[<http://www.ncld.org>](http://www.ncld.org)
- National Center for Nutrition and Dietetics**
 American Dietetic Association
 216 West Jackson Blvd, Ste. 800
 Chicago, IL 60606-6995
 (800) 366-1655
- National Center for the Preservation of Medicinal Herbs**
 3350 Beech Grove Road
 Rutland, OH 45775
 (740) 742-4401
- National Center on Shaken Baby Syndrome**
 2955 Harrison Blvd #102
 Ogden, UT 84403
 (801) 627-3399
[<http://www.dontshake.com>](http://www.dontshake.com)
- National Center on Sleep Disorders Research**
 Two Rockledge Centre
 6701 Rockledge Dr
 Bethesda, MD 20892
 (301) 435-0199
- National Certification Board for Therapeutic Massage and Bodywork**
 8201 Greensboro Dr, Ste. 300
 McLean, VA 22102
- National Children's Eye Care Foundation**
 One Clinic Center A3-108
 Cleveland, OH 44195
 (216) 444-0488
- National Cholesterol Education Program**
 NHLBI Information Center
 PO Box 30105
 Bethesda, MD 20824-0105
[<http://www.nhlbi.nih.gov>](http://www.nhlbi.nih.gov)
- National Chronic Pain Outreach Association Inc**
 PO Box 274
 Millboro, VA 24460
 (540) 997-5004
- National Clearinghouse for Alcohol and Drug Information**
 11426-28 Rockville Pike, Ste. 200
 Rockville, MD 20852
 (800) 729-6686
[<http://www.health.org>](http://www.health.org)
- National Clearinghouse on Child Abuse and Neglect Information**
 PO Box 1182
 Washington, DC 20013-1182
 (800) 394-3366
[<http://www.calib.com/nccanch>](http://www.calib.com/nccanch)

- National Coalition for Cancer Survivorship**
1010 Wayne Ave 7th Floor
Silver Spring, MD 20910-5600
(301) 650-9127
(877) NCCS-YES
[<http://www.canssearch.org>](http://www.canssearch.org)
- National Committee to Prevent Child Abuse**
200 S Michigan Ave 17th Floor
Chicago, IL 60604
(312) 663-3520
[<http://www.childabuse.org>](http://www.childabuse.org)
- National Congenital Port Wine Stain Foundation**
123 East 63rd St
New York, NY 10021
(516) 867-5137
- National Council on Alcoholism and Drug Dependence**
12 West 21st St
New York, NY 10010
(800) 622-2255
[<http://www.ncadd.org>](http://www.ncadd.org)
- National Depressive and Manic-Depressive Association (NDMDA)**
730 N Franklin St, Ste. 501
Chicago, IL 60610
(800) 826-3632
[<http://www.ndmda.org>](http://www.ndmda.org)
- National Digestive Diseases Information Clearinghouse**
2 Information Way
Bethesda, MD 20892-3570
[<mailto:niddic@aeriecom>](mailto:niddic@aeriecom)
[<http://www.niddk.nih.gov/Brochures/NDDIC.htm>](http://www.niddk.nih.gov/Brochures/NDDIC.htm)
- National Easter Seal Society**
230 W Monroe St, Ste. 1800
Chicago, IL 60606-4802
(312) 726-6200
(800) 221-6827
[<http://www.easter-seals.org>](http://www.easter-seals.org)
- National Eating Disorders Organization (NEDO)**
6655 South Yale Ave
Tulsa OK 74136
(918) 481-4044
- National Enuresis Society**
7777 Forest Lane, Ste. C-737
Dallas, TX 75230-2518
(800) 697-8080
[<http://www.pedsumm.edu/Centers/NES>](http://www.pedsumm.edu/Centers/NES)
- National Eye Institute**
2020 Vision Place
Bethesda, MD 20892-3655
(301) 496-5248
[<http://www.nei.nih.gov>](http://www.nei.nih.gov)
- National Familial Pancreas Tumor Registry**
The Johns Hopkins Hospital
600 North Wolfe St
Baltimore, MD 21287-6417
(410) 377-7450
- National Federation of the Blind**
1800 Johnson St
Baltimore, MD 21230
(301) 569-9314
- National Foundation for Vitiligo and Pigment Disorders**
9032 South Normandy Dr
Centerville, OH 45459
(513) 885-5739
- National Fragile X Foundation**
PO Box 190488
San Francisco, CA 94119-0988
(800) 688-8765
(510) 763-6030
Fax: (510) 763-6223
[<mailto:natfx@sprintmail.com>](mailto:natfx@sprintmail.com)
[<http://nfxf.org>](http://nfxf.org)
- National Gaucher Foundation**
11140 Rockville Pike, Ste. 350
Rockville, MD 20852-3106
(800) 925-8885
[<http://www.gaucherdisease.org>](http://www.gaucherdisease.org)
- National Guild of Hypnotists**
PO Box 308
Merrimack NH
[<http://www.ngh.net>](http://www.ngh.net)
- National Head Injury Foundation**
333 Turnpike Rd
Southboro, MA 01722
(617) 485-9950
- National Headache Foundation**
428 W St James Place
Chicago, IL 60614
(800) 843-2256
[<http://www.headaches.org>](http://www.headaches.org)
- National Hearing Aid Society**
20361 Middlebelt
Livonia MI 48152
(800) 521-5247
(313) 478-2610
- National Heart Lung and Blood Institute**
PO Box 30105
Bethesda, MD 20824-0105
(301) 251-1222
[<http://www.nhlbi.nih.gov>](http://www.nhlbi.nih.gov)
- National Hemophilia Foundation**
116 West 32nd St
11th Floor
New York, NY 10001
(800) 42-HANDI
[<http://www.info@hemophilia.org>](http://www.info@hemophilia.org)
- National Human Genome Research Institute**
The National Institutes of Health
9000 Rockville Pike
Bethesda, MD 20892
(301) 496-2433
[<http://www.nhgri.nih.gov>](http://www.nhgri.nih.gov)
- National Hypoglycemia Association Inc**
PO Box 120
Ridgewood, NJ 07451
(201) 670-1189
- National Institute on Alcohol Abuse and Alcoholism (NIAAA)**
6000 Executive Blvd
Bethesda Maryland 20892-7003
[<http://www.niaaa.nih.gov>](http://www.niaaa.nih.gov)
- National Institute of Allergy and Infectious Disease**
Building 31 Room 7A-50
31 Center Dr
MSC 2520
Bethesda, MD 20892-2520
(301) 496-5717
[<http://www.niaid.nih.gov/default.htm>](http://www.niaid.nih.gov/default.htm)
- National Institute of Arthritis and Musculoskeletal and Skin Diseases**
9000 Rockville Pike
Bldg 31, Rm 9A04
Bethesda, MD 20892
- National Institute of Child Health and Human Development**
Bldg 31, Room 2A32 MSC 2425
31 Center Dr
Bethesda, MD 20892-2425
(800) 505-2742
[<http://www.nichd.nih.gov/sids/sids.htm>](http://www.nichd.nih.gov/sids/sids.htm)
- National Institute on Deafness and Other Communication Disorders**
National Institutes of Health
31 Center Dr
MSC 2320
Bethesda, MD 20892-2320
[<http://www.nidcd.nih.gov>](http://www.nidcd.nih.gov)
- National Institute of Dental Research**
31 Center Dr
MSC 2190
Building 31, Room 5B49
Bethesda, MD 20892-2190
- National Institute of Diabetes and Digestive and Kidney Diseases**
31 Center Dr
USC2560 Building 31, Room 9A-04
Bethesda, MD 20892-2560
(301) 496-3583
[<http://www.Niddk.nih.gov>](http://www.Niddk.nih.gov)
- National Institute on Drug Abuse**
PO Box 30652

- Bethesda, MD 20824-0652
 (888) 644-6432
[<http://www.drugabuse.gov>](http://www.drugabuse.gov)
- National Institute of General Medical Sciences**
 Division of Pharmacology Physiology and Biological Chemistry
 45 Center Dr
 MSC 6200
 Bethesda, MD 20892-6200
- National Institute of Mental Health**
 Mental Health Public Inquiries
 5600 Fishers Lane
 Room 15C-05
 Rockville, MD 20857
 (888) 826-9438
[<http://www.nimh.nih.gov>](http://www.nimh.nih.gov)
- National Institute of Mental Health Panic Campaign**
 Rm 15C-05
 5600 Fishers Lane
 Rockville, MD 20857
 (800) 647-2642
[<http://www.nimh.nih.gov>](http://www.nimh.nih.gov)
- National Institute of Neurological Disorders and Stroke**
 PO Box 5801
 Bethesda, MD 20824
 (800) 352-9424
[<http://www.ninds.nih.gov/index.htm>](http://www.ninds.nih.gov/index.htm)
- National Jewish Center for Immunology and Respiratory Medicine**
 1400 Jackson St
 Denver, CO 80206
 (800) 222-5864
[<http://www.nationaljewish.org/main.html>](http://www.nationaljewish.org/main.html)
- National Kidney Foundation**
 30 East 33rd St
 New York, NY 10016
 (800) 622-9010
[<http://www.kidney.org>](http://www.kidney.org)
- National Kidney and Urologic Diseases Information Clearinghouse**
 3 Information Way
 Bethesda, MD 20892
 (800) 891-5390
[<http://www.niddk.nih.gov/health/kidney/nkudic.htm>](http://www.niddk.nih.gov/health/kidney/nkudic.htm)
- National Lead Information Center National Safety Council**
 1025 Connecticut Ave NW, Ste. 1200
 Washington, DC 20036
 (800) 532-3394
[<http://www.nsc.org/ehc/lead.htm>](http://www.nsc.org/ehc/lead.htm)
- National Lymphedema Network (NLN)**
 2211 Post St, Ste. 404
 San Francisco, CA 94115
 (800) 541-3259
[<http://www.hooked.net>](http://www.hooked.net)
- National Mental Health Association**
 1021 Prince St
 Alexandria, VA 22314
 (703) 684-7722
[<http://www.nmha.org>](http://www.nmha.org)
- National MPS Society**
 102 Aspen Dr
 Downingtown, PA 19335
 (610) 942-0100
 Fax: (610) 942-7188
 info@mpssociety.org
[<http://www.mpssociety.org>](http://www.mpssociety.org)
- National Necrotizing Fascitis Foundation**
 PO Box 145
 Niantic, CT 06357
 (616) 261-2538
[<http://www.nnff.org>](http://www.nnff.org)
- National Organization for Albinism and Hypopigmentation (NOAH)**
 1530 Locust St #29
 Philadelphia, PA 19102-4415
 (800) 473-2310
[<http://www.albinism.org>](http://www.albinism.org)
- National Organization for Rare Disorders (NORD)**
 PO Box 8923
 New Fairfield, CT 06812-8923
 (203) 746-6518
 (800) 999-6673
 Fax: (203) 746-6481
[<http://www.rarediseases.org>](http://www.rarediseases.org)
- National Osteoporosis Foundation**
 1150 17th St NW, Ste. 500
 Washington, DC 20036-4603
[<http://www.nof.org>](http://www.nof.org)
- National Pancreas Foundation**
 PO Box 935
 Wexford, PA 15090-0935
[<http://www.pancreasfoundation.org>](http://www.pancreasfoundation.org)
- National Parkinson Foundation**
 1501 NW Ninth Ave
 Bob Hope Road
 Miami, FL 33136
[<http://www.parkinson.org>](http://www.parkinson.org)
- National Prostate Cancer Coalition**
 1156 15th St NW
 Washington, DC 20005
 (202) 463-9455
[<http://www.4npcc.org>](http://www.4npcc.org)
- National Psoriasis Foundation**
 6600 SW 92nd Ave, Ste. 300
 Portland, OR 97223
 (800) 723-9166
[<http://www.psoriasis.org>](http://www.psoriasis.org)
- National Respiratory Distress Syndrome Foundation**
 PO Box 723
 Montgomeryville, PA 18936
- National Safe Kids Campaign**
 1301 Pennsylvania Ave, Ste. 1000
 Washington, DC 20004-1707
[<http://pedscmwustledu/All-Net/english/neurpage/protect/drown.htm>](http://pedscmwustledu/All-Net/english/neurpage/protect/drown.htm)
- National Sleep Foundation**
 1522 K St NW, Ste. 500
 Washington, DC 20005
[<http://www.sleepfoundation.org>](http://www.sleepfoundation.org)
- National Society of Genetic Counselors**
 233 Canterbury Dr
 Wallingford, PA 19086-6617
 (610) 872-1192
[<http://www.nsge.org/GeneticCounseling>You.asp>](http://www.nsge.org/GeneticCounseling>You.asp)
- National Society to Prevent Blindness**
 500 East Remington Rd
 Schaumburg, IL 60173
 (708) 843-2020
 (800) 331-2020
[<http://www.preventblindness.org>](http://www.preventblindness.org)
- National Stroke Association**
 9707 E Easter Lane
 Englewood, CO 80112
 (800) 787-6537
[<http://www.stroke.org>](http://www.stroke.org)
- National Tay-Sachs and Allied Diseases Association**
 2001 Beacon St, Ste. 204
 Brookline, MA 02146
 (800) 906-8723
[<http://www.ntsad.org>](http://www.ntsad.org)
- National Tourette Syndrome Association Inc**
 42-40 Bell Blvd
 Bayside, NY 11361-2820
 (718) 224-2999
 Fax: (718) 279-9596
 tourette@ixnetcom.com
- National, Vaginitis Association**
 117 South Cook St, Ste. 315
 Barrington, IL 60010
 (800) 909-8745
 VagAssoc@aol.com
[<http://www.vaginalinfections.org>](http://www.vaginalinfections.org)
- National Vitiligo Foundation**
 PO Box 6337
 Tyler, TX 75703
 (903) 531-9767
 7307133@compuserve.com

National Women's Health Resource Center

120 Albany St, Ste. 820
New Brunswick, NJ 08901
(877) 986-9472
[<http://www.healthywomen.org>](http://www.healthywomen.org)

Neuropathy Association

60 E 42nd St, Ste. 942
New York, NY 10165
(212) 692-0662
[<http://www.neuropathy.org>](http://www.neuropathy.org)

North American Society of Homeopaths

10700 Old County Rd 15 #350
Minneapolis, MN 55441
(612) 593-9458

North American Vegetarian Society (NAVS)

PO Box 72
Dolgeville, NY 13329
(518) 568-7970

Northeastern T'ai Chi Chuan Association

163 West 23rd St 5th Floor
New York, NY 10011
(212) 741-1922

Northwest Center for Environmental Medicine

177 NE 102nd St
Portland, OR 97220
(503) 561-0966

O**Obsessive-Compulsive Anonymous**

PO Box 215
New Hyde Park, NY 11040
(516) 741-4901
west24th@aol.com
[<http://members@aol.com/west24th/index.html>](http://members@aol.com/west24th/index.html)

Office on Smoking and Health

Centers for Disease Control and Prevention
Mailstop K-50
4770 Buford Highway NE
Atlanta, GA 30341-3724
(800) 232-1311
<http://www.cdc.gov/tobacco/>

Office of the Special Assistant for Gulf War Illnesses

5113 Leesburg Pike, Ste. 901
Falls Church, VA 22041
(703) 578-8518
[<http://www.gulfink.osd.mil>](http://www.gulfink.osd.mil)

Optician Association of America

7023 Little River Turnpike, Ste. 207
Annandale, VA 22003

(703) 916-8856
[<http://www.opticians.org>](http://www.opticians.org)

Oral Health Education Foundation Inc

5865 Colonist Dr
PO Box 396
Fairburn, GA 30213
(770) 969-7400

Osteoporosis and Related Bone Diseases-National Resource Center

1150 17th S NW, Ste. 500
Washington, DC 20036
(800) 624-2663

Overeaters Anonymous World Service Office

6075 Zenith, CT NE
Rio Rancho NM 87124
(505) 891-2664
[<http://www.overeatersanonymous.org>](http://www.overeatersanonymous.org)

P**Paget Foundation**

200, VA rick St, Ste. 1004
New York, NY 10014-4810
(800)23-PAGET

Parents Families and Friends of Lesbians and Gays

1726 M St NW, Ste. 400
Washington, DC 20036
(202) 467-8180
[<http://www.pflag.org>](http://www.pflag.org)

Pediatric/Adolescent Gastroesophageal Reflux Association Inc

PO Box 1153
Germantown, MD 20875-1153
(301) 601-9541
[<http://www.reflux.org>](http://www.reflux.org)

Periodic Paralysis Association

5225 Canyon Crest Dr #71-351
Riverside, CA 92507
(909) 781-4401
[<http://www.periodicparalysis.org>](http://www.periodicparalysis.org)

Phoenix Project/Head Injury Hotline

Box 84151
Seattle, WA 98124
(206)621-8558
[<http://www.headinjury.com>](http://www.headinjury.com)

Pilates Studio

2121 Broadway, Ste. 201
New York, NY 10023-1786
(800)474-5283
(888) 474-5283
(212)875-0189
Fax: (212) 769-2368
[<http://www.pilates-studio.com>](http://www.pilates-studio.com)

Planned Parenthood Federation of America Inc

810 Seventh Ave
New York, NY 10019
(800) 669-0156
[<http://www.plannedparenthood.org>](http://www.plannedparenthood.org)

Polycystic Kidney Disease Foundation

4901 Main St
Kansas City, MO 64112-2634
(800) PKD-CURE
[<http://www.pkdcure.org/home.htm>](http://www.pkdcure.org/home.htm)

Polycystic Ovarian Syndrome Association

PO Box 80517
Portland, OR 97280
(877) 775-7267
info@pcosupport.org
[<http://www.pcosupport.org>](http://www.pcosupport.org)

Postpartum Support International

927 North Kellogg Ave
Santa Barbara, CA 93111
(805) 967-7636

Prader-Willi Foundation

223 Main St
Port Washington, NY 11050
(800)253-7993
[<http://www.prader-willi.org>](http://www.prader-willi.org)

Prader-Willi Syndrome Association(USA)

5700 Midnight Pass Rd
Sarasota, FL 34242
(800) 926-4797
[<http://www.pwsusa.org>](http://www.pwsusa.org)

Pregnancy and Infant Loss Support (SHARE)

St Joseph Health Center
300 First Capitol Dr
St Charles, MO 63301
(800) 821-6819
[<http://www.nationalshareoffice.com/index.html>](http://www.nationalshareoffice.com/index.html)

Prevent Blindness America

500 East Remington Road
Schaumburg, IL 60173
(800) 331-2020
[<http://www.prevent-blindness.org>](http://www.prevent-blindness.org)

Project Inform

205 13th St #2001
San Francisco, CA 94103
(800) 822-7422
[<http://www.projinf.org>](http://www.projinf.org)

Prostate Health Council

American Foundation for Urologic Disease
1128 N Charles St
Baltimore, MD 21201-5559
(800) 828-7866
[<http://www.afud.org>](http://www.afud.org)

Prostatitis Foundation Information Distribution Center
 2029 Ireland Grove Park
 Bloomington, IL 61704
 (309) 664-6222
<http://www.prostate.org>

Pulmonary Fibrosis Foundation
 1075 Santa Fe Dr
 Denver, CO 80204
 (720) 932-7850
<http://pulmonaryfibrosis.org>

Pulmonary Hypertension Association
 PO Box 24733
 Speedway, IN 46224-0733
 (800) 748-7274
<http://www.phassociation.org>

PXE International Inc
 23 Mountain St
 Sharon, MA 02067
 (781) 784-3817
 Fax: (781) 784-6672
 PXEInter@aol.com
<http://www.pxe.org>

Q

Qigong Human Life Research Foundation
 PO Box 5327
 Cleveland, OH 44101
 (216) 475-4712

R

Radiological Society of North America
 820 Jorie Blvd
 Oak Brook, IL 60523-2251
 (630) 571-2670
<http://www.rsna.org>

Rainbows Down Under—A Trisomy 18 and Trisomy 13 Resource
 SOFT Australia 198 Oak Rd
 Kirrawee NSW 2232
 Australia
 02-9521-6039
<http://membersoptushomecom.au/karens>

Rape Abuse and Incest National Network
 635-B Pennsylvania Ave SE
 Washington, DC 20003
 (800) 656-HOPE

Raynaud's & Scleroderma Association (UK)
 112 Crewe Road
 Alsager Cheshire ST7 2JA

United Kingdom
 (44) (0) 1270 872776
webmaster@raynauds.demon.co.uk
<http://www.raynauds.demon.co.uk>

Reflexology Association of America
 4012 Rainbow St
 KPMB#585
 Las Vegas, NV 89103-2059

Rehabilitation International
 25 East 21st St
 New York, NY 10010
 (212) 420-1500

Resolve
 1310 Broadway
 Somerville, MA 02144-1731
 (617) 623-0744
<http://www.resolve.org>

Restless Legs Syndrome Foundation
 1904 Banbury Road
 Raleigh, NC 27608-4428
 (919) 781-4428
<http://www.rls.org>

Retinoblastoma International
 4650 Sunset Blvd
 Mail Stop #88
 Los Angeles, CA 90027
 (323) 669-2299
info@retinoblastoma.net
http://www.retinoblastoma.net/rbi/index_rbi.htm

Retinoblastoma Society
 Saint Bartholomew's Hospital
 London EC1A 7BE
 United Kingdom
 020 7600 3309
 Fax: 020 7600 8579
<http://dsdialpipex.com/rbinfo>

Rocky Mountain Institute of Yoga and Ayurveda
 PO Box 1091
 Boulder, CO 80306
 (303)443-6923

Rolf Institute of Structural Integration
 209 Canyon Blvd
 PO Box 1868
 Boulder, CO 80306-1868
 (303) 449-5903
 (800) 530-8875
<http://www.rolf.org>

S

Schizophrenics Anonymous
 15920 W Twelve Mile
 Southfield MI 48076
 (248) 477-1983

Scleroderma Foundation
 12 Kent Way, Ste. 101
 Byfield, MA 01922
 (978) 463-5843
 (800) 722-HOPE
 Fax: (978) 463-5809
<http://www.scleroderma.org>

Second Wind Lung Transplant Association Inc
 9030 West Lakeview Court
 Crystal River, FL 34428
 (888) 222-2690
<http://www.arthouse.com/secondwind>

Self Help for Hard of Hearing People Inc
 7800 Wisconsin Ave
 Bethesda, MD 20814
 (301) 657-2248
<http://www.shhh.org>

Sensory Integration International/The Ayres Clinic
 1514 Cabrillo Ave
 Torrance, CA 90501-2817

Sexuality Information and Education Council of the United States
 130 W 42nd St, Ste. 350
 New York, NY 10036
 (212) 819-9770
<http://www.siecus.org>

Shriners Hospitals for Children
 International Shrine Headquarters
 2900 Rocky Point Dr
 Tampa, FL 33607-1460
 (813) 281-0300
<http://www.shrinershq.org>

Shy-Drager Syndrome Support Group
 2004 Howard Lane
 Austin, TX 78728
 (800) 288-5582
<http://www.shy-drager.com>

Sickle Cell Disease Association of America Inc
 200 Corporate Point, Ste. 495
 Culver City, CA 90230-8727
 (800) 421-8453
Scdaa@sicklecelldisease.org
<http://sicklecelldisease.org/>

Society for Light Treatment and Biological Rhythms
 PO Box 591687
 174 Cook St
 San Francisco, CA 94159-1687
<http://www.websciences.org/sltbr>

Society for Progressive Supranuclear Palsy Inc
 Ste. #5065
 Johns Hopkins Outpatient Center
 601 N Caroline St

Baltimore, MD 21287
 (800) 457-4777
[<http://www.psp.org>](http://www.psp.org)

Society of Neuro-Linguistic Programming
 PO Box 424
 Hopatcong, NJ 07843
 (201) 770-3600

Society for Mucopolysaccharide Diseases
 46 Woodside Rd
 Amersham Buckinghamshire HP6 6AJ
 United Kingdom
 +44 (01494) 434156
[<http://www.mppssociety.co.uk>](http://www.mppssociety.co.uk)

Society of Nuclear Medicine
 1850 Samuel Morse Dr
 Reston, VA 10016
 (703) 708-9000
[<http://www.snm.org>](http://www.snm.org)

Spina Bifida Association of America
 4590 MacArthur Blvd NW, Ste. 250
 Washington, DC 20007-4226
 (800) 621-3141
 (202) 944-3285
 Fax: (202) 944-3295

Spine Center
 1911 Arch St
 Philadelphia, PA 19103
 (215) 665-8300
[<http://www.thespinecenter.com>](http://www.thespinecenter.com)

SPOHNC Support for People with Oral and Head and Neck Cancer
 PO Box 53
 Locust Valley, NY 11560-0053
 (800) 377-0928
[<http://www.spohnc.org>](http://www.spohnc.org)

Sudden Arrhythmia Death Syndromes Foundation
 540 Arapeen Dr, Ste. 207
 Salt Lake City UT 84108
 (800) STOP SAD
[<http://www.sads.org>](http://www.sads.org)
[<http://www.ihc.com/research/longqt.html>](http://www.ihc.com/research/longqt.html)

Sudden Infant Death Syndrome Alliance
 1314 Bedford Ave, Ste. 210
 Baltimore, MD 21208
 (800) 221-7437
[<http://www.sidsalliance.org>](http://www.sidsalliance.org)

Support Organization for Trisomy 18 13 and Related Disorders (SOFT)
 2982 South Union St
 Rochester, NY 14624
 (800) 716-7638
[<http://www.trisomy.org>](http://www.trisomy.org)

T

Tardive Dyskinesia/Tardive Dystonia National Association

PO Box 45732
 Seattle, WA 98145-0732
 (206) 522-3166

Texas Heart Institute Heart Information Service

PO Box 20345
 Houston, TX 77225-0345
 (800) 292-2221
[<http://www.tmc.edu/thi/his.html>](http://www.tmc.edu/thi/his.html)

Thyroid Foundation of America Inc

Ruth Sleeper Hall RSL350
 40 Parkman St
 Boston, MA 02114-2698
 (800) 832-8321
[<http://www.tfaeweb.org/pub/tfa>](http://www.tfaeweb.org/pub/tfa)

Thyroid Society for Education and Research

7515 South Main St, Ste. 545
 Houston, TX 77030
 (800) 849-7643
[<http://the-thyroid-society.org/thyroid.html>](http://the-thyroid-society.org/thyroid.html)

Tourette Syndrome Foundation of Canada

194 Jarvis St #206
 Toronto ONT M5B 2B7
 Canada
 (800) 361-3120
tsfcorg@sympatico.ca
[<http://www.tourette.ca>](http://www.tourette.ca)

Trager Institute

21 Locust Ave
 Mill Valley, CA 94941-2806
 (415) 388-2688
 Fax: (415) 399-2710
admin@trager.com
[<http://www.trager.com>](http://www.trager.com)

Trans-Hyperboreau Institute of Science

PO Box 2344
 Sausalito, CA 94966
 (415) 331-0230
 (800) 485-8095
 Fax: (415) 331-0231

Transverse Myelitis Association

1787 Sutter Parkway
 Powell, OH 43065-8806
 (614) 766-1806
[<http://www.myelitis.org>](http://www.myelitis.org)

Trichotillomania Learning Center Inc

1215 Mission St, Ste. 2
 Santa Cruz, CA 95060
 (831) 457-1004
 Fax: (831) 426-4383
[<http://www.trich.org>](http://www.trich.org)

Trigeminal Neuralgia/Tic Douloureux Association

PO Box 340
 Barnegat Light, NJ 08006
 (609) 361-1014

Turner Syndrome Society of England

2 Mayfield Ave
 London W41PW
 United Kingdom
 44 (0)181-994 7625
 Fax: 44 (0)181-995 9075
[<http://www.exnet.com/staff/sys4/ts.html>](http://www.exnet.com/staff/sys4/ts.html)
[<http://www.tss.org.uk>](http://www.tss.org.uk)

U

Undersea and Hyperbaric Medical Society

10531 Metropolitan Ave
 Kensington, MD 20895
 (301) 942-2980
[<http://www.uhms.org>](http://www.uhms.org)

United Cerebral Palsy Association Inc (UCP)

1660 L St NW, Ste. 700
 Washington, DC 20036-5602
 (202) 776-0406
 (800) 872-5827
[<http://www.ucpa.org>](http://www.ucpa.org)

United Network for Organ Sharing

1100 Boulders Parkway, Ste. 500
 PO Box 13770
 Richmond, VA 23225-8770
 (804) 330-8500
[<http://www.unos.org>](http://www.unos.org)

United Ostomy Association Inc (UOA)

19772 MacArthur Blvd, Ste. 200
 Irvine, CA 92612-2405
 (800) 826-0826
[<http://www.uoa.org>](http://www.uoa.org)

United Plant Savers

PO Box 98
 East Barre VT 05649
 (802) 479-9825
[<http://www.plantsavers.org>](http://www.plantsavers.org)

United States Department of Health and Human Services

200 Independence Ave SW
 Washington, DC 20201
 (877) 696-6775
[<http://www.hhs.gov>](http://www.hhs.gov)

United States Department of Justice Drug Enforcement Administration

2401 Jefferson Davis Highway
 Alexandria, VA 22301
 (888) 644-6432
[<http://www.usdoj.gov/dea>](http://www.usdoj.gov/dea)

**United States Department of Justice
Office for Victims of Crime**
810 7th St NW
Washington, DC 20531

**United States Food and Drug
Administration (FDA) Center for
Drug Evaluation and Research**
Viagra Information
<http://www.fda.gov/cder/consumerinfo/viagra/default.htm>

**United States National Library of
Medicine**
8600 Rockville Pike
Bethesda, MD 20894
(888) 346-3656
<http://www.nlm.nih.gov>

**United States Renal Data System
(USRDS)**
The University of Michigan
315 W Huron, Ste. 240
Ann Arbor MI 48103
(734) 998-6611
<http://www.medumichedu/usrds>

University of California Los Angeles
Harbor-UCLA Medical Center
Research and Education Institute
1124 W Carson St B-4
South Torrance, CA 90502

**University of Illinois Center for
Narcolepsy Research**
845 S Damen Ave
Chicago, IL 60612
(312) 996-5176

Upledger Institute
11211 Prosperity Farms Rd
Palm Beach Gardens, FL 33410
(800) 233-5880
Fax: (561) 622-4771
<http://www.upledger.com>

Vestibular Disorders Association
PO Box 4467
Portland, OR 97208-4467
(503) 229-7705
<http://www.teleport.com/~veda>

Veterans Administration
Persian Gulf Medical Information
Helpline
400 South 18th St
St Louis, MO 63103-2271
(800)749-8387

(312) 644-6610
<http://www.wcn.org>

World Hypnosis Organization Inc
2521 W Montrose Ave
Chicago, IL 60618
<http://www.worldhypnosis.org/about.html>

**Worldwide Education and Awareness
for Movement Disorders**
One Gustave L Levy Place
Box 1052
New York, NY 10029
(800) 437-6683
<http://www.wemove.org>

Wound Care Institute
1100 NE 163rd St, Ste. #101
North Miami Beach, FL 33162
(305) 919-9192
<http://woundcare.org>

Wound Healing Society
1550 South Coast Highway, Ste. 201
Laguna Beach, CA 92651
(888) 434-4234
<http://wizardpharmwayne.edu/woundsoc/WHS.htm>

**Wright State University Aerospace
Medicine Program**
PO Box 92
Dayton, OH 45401-0927
(937) 276-8338
<http://www.medwright.edu>

Y

**Y-ME National Organization for
Breast Cancer Information and
Support**
18220 Harwood Ave
Homewood, IL 60430
(800) 221-2141
(708) 799-8228

Z

Zain Hansen MPS Foundation
23400 Henderson Rd
Covelo, CA 95420
(800) 767-3121

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