

THE OFFICIAL
PATIENT'S SOURCEBOOK
on

RESTLESS
LEG
SYNDROME



JAMES N. PARKER, M.D.
AND PHILIP M. PARKER, PH.D., EDITORS

ICON Health Publications
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Dedication

To the healthcare professionals dedicating their time and efforts to the study of restless leg syndrome.

Acknowledgements

The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this sourcebook which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which directly or indirectly are dedicated to restless leg syndrome. All of the *Official Patient's Sourcebooks* draw from various agencies and institutions associated with the United States Department of Health and Human Services, and in particular, the Office of the Secretary of Health and Human Services (OS), the Administration for Children and Families (ACF), the Administration on Aging (AOA), the Agency for Healthcare Research and Quality (AHRQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Healthcare Financing Administration (HCFA), the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the institutions of the National Institutes of Health (NIH), the Program Support Center (PSC), and the Substance Abuse and Mental Health Services Administration (SAMHSA). In addition to these sources, information gathered from the National Library of Medicine, the United States Patent Office, the European Union, and their related organizations has been invaluable in the creation of this sourcebook. Some of the work represented was financially supported by the Research and Development Committee at INSEAD. This support is gratefully acknowledged. Finally, special thanks are owed to Tiffany LaRochelle for her excellent editorial support.

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In addition to restless leg syndrome, *Official Patient's Sourcebooks* are available for the following related topics:

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INTRODUCTION

Overview

Dr. C. Everett Koop, former U.S. Surgeon General, once said, “The best prescription is knowledge.”¹ The Agency for Healthcare Research and Quality (AHRQ) of the National Institutes of Health (NIH) echoes this view and recommends that every patient incorporate education into the treatment process. According to the AHRQ:

Finding out more about your condition is a good place to start. By contacting groups that support your condition, visiting your local library, and searching on the Internet, you can find good information to help guide your treatment decisions. Some information may be hard to find—especially if you don’t know where to look.²

As the AHRQ mentions, finding the right information is not an obvious task. Though many physicians and public officials had thought that the emergence of the Internet would do much to assist patients in obtaining reliable information, in March 2001 the National Institutes of Health issued the following warning:

The number of Web sites offering health-related resources grows every day. Many sites provide valuable information, while others may have information that is unreliable or misleading.³

¹ Quotation from <http://www.drkoop.com>.

² The Agency for Healthcare Research and Quality (AHRQ):
<http://www.ahrq.gov/consumer/diaginfo.htm>.

³ From the NIH, National Cancer Institute (NCI):
<http://cancertrials.nci.nih.gov/beyond/evaluating.html>.

Since the late 1990s, physicians have seen a general increase in patient Internet usage rates. Patients frequently enter their doctor's offices with printed Web pages of home remedies in the guise of latest medical research. This scenario is so common that doctors often spend more time dispelling misleading information than guiding patients through sound therapies. *The Official Patient's Sourcebook on Restless Leg Syndrome* has been created for patients who have decided to make education and research an integral part of the treatment process. The pages that follow will tell you where and how to look for information covering virtually all topics related to restless leg syndrome, from the essentials to the most advanced areas of research.

The title of this book includes the word "official." This reflects the fact that the sourcebook draws from public, academic, government, and peer-reviewed research. Selected readings from various agencies are reproduced to give you some of the latest official information available to date on restless leg syndrome.

Given patients' increasing sophistication in using the Internet, abundant references to reliable Internet-based resources are provided throughout this sourcebook. Where possible, guidance is provided on how to obtain free-of-charge, primary research results as well as more detailed information via the Internet. E-book and electronic versions of this sourcebook are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). Hard copy users of this sourcebook can type cited Web addresses directly into their browsers to obtain access to the corresponding sites. Since we are working with ICON Health Publications, hard copy *Sourcebooks* are frequently updated and printed on demand to ensure that the information provided is current.

In addition to extensive references accessible via the Internet, every chapter presents a "Vocabulary Builder." Many health guides offer glossaries of technical or uncommon terms in an appendix. In editing this sourcebook, we have decided to place a smaller glossary within each chapter that covers terms used in that chapter. Given the technical nature of some chapters, you may need to revisit many sections. Building one's vocabulary of medical terms in such a gradual manner has been shown to improve the learning process.

We must emphasize that no sourcebook on restless leg syndrome should affirm that a specific diagnostic procedure or treatment discussed in a research study, patent, or doctoral dissertation is "correct" or your best option. This sourcebook is no exception. Each patient is unique. Deciding on

appropriate options is always up to the patient in consultation with their physician and healthcare providers.

Organization

This sourcebook is organized into three parts. Part I explores basic techniques to researching restless leg syndrome (e.g. finding guidelines on diagnosis, treatments, and prognosis), followed by a number of topics, including information on how to get in touch with organizations, associations, or other patient networks dedicated to restless leg syndrome. It also gives you sources of information that can help you find a doctor in your local area specializing in treating restless leg syndrome. Collectively, the material presented in Part I is a complete primer on basic research topics for patients with restless leg syndrome.

Part II moves on to advanced research dedicated to restless leg syndrome. Part II is intended for those willing to invest many hours of hard work and study. It is here that we direct you to the latest scientific and applied research on restless leg syndrome. When possible, contact names, links via the Internet, and summaries are provided. It is in Part II where the vocabulary process becomes important as authors publishing advanced research frequently use highly specialized language. In general, every attempt is made to recommend “free-to-use” options.

Part III provides appendices of useful background reading for all patients with restless leg syndrome or related disorders. The appendices are dedicated to more pragmatic issues faced by many patients with restless leg syndrome. Accessing materials via medical libraries may be the only option for some readers, so a guide is provided for finding local medical libraries which are open to the public. Part III, therefore, focuses on advice that goes beyond the biological and scientific issues facing patients with restless leg syndrome.

Scope

While this sourcebook covers restless leg syndrome, your doctor, research publications, and specialists may refer to your condition using a variety of terms. Therefore, you should understand that restless leg syndrome is often considered a synonym or a condition closely related to the following:

- Anxietas Tibialis

- Crazy Legs
- Ekbom Syndrome
- Hereditary Acromelalgia
- Nocturnal Myoclonus
- Wittmaack-ekbom Syndrome

In addition to synonyms and related conditions, physicians may refer to restless leg syndrome using certain coding systems. The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) is the most commonly used system of classification for the world's illnesses. Your physician may use this coding system as an administrative or tracking tool. The following classification is commonly used for restless leg syndrome:⁴

- 333.99 nocturnal myoclonus

For the purposes of this sourcebook, we have attempted to be as inclusive as possible, looking for official information for all of the synonyms relevant to restless leg syndrome. You may find it useful to refer to synonyms when accessing databases or interacting with healthcare professionals and medical librarians.

Moving Forward

Since the 1980s, the world has seen a proliferation of healthcare guides covering most illnesses. Some are written by patients or their family members. These generally take a layperson's approach to understanding and coping with an illness or disorder. They can be uplifting, encouraging, and highly supportive. Other guides are authored by physicians or other healthcare providers who have a more clinical outlook. Each of these two styles of guide has its purpose and can be quite useful.

As editors, we have chosen a third route. We have chosen to expose you to as many sources of official and peer-reviewed information as practical, for the purpose of educating you about basic and advanced knowledge as

⁴ This list is based on the official version of the World Health Organization's 9th Revision, International Classification of Diseases (ICD-9). According to the National Technical Information Service, "ICD-9CM extensions, interpretations, modifications, addenda, or errata other than those approved by the U.S. Public Health Service and the Health Care Financing Administration are not to be considered official and should not be utilized. Continuous maintenance of the ICD-9-CM is the responsibility of the federal government."

recognized by medical science today. You can think of this sourcebook as your personal Internet age reference librarian.

Why “Internet age”? All too often, patients diagnosed with restless leg syndrome will log on to the Internet, type words into a search engine, and receive several Web site listings which are mostly irrelevant or redundant. These patients are left to wonder where the relevant information is, and how to obtain it. Since only the smallest fraction of information dealing with restless leg syndrome is even indexed in search engines, a non-systematic approach often leads to frustration and disappointment. With this sourcebook, we hope to direct you to the information you need that you would not likely find using popular Web directories. Beyond Web listings, in many cases we will reproduce brief summaries or abstracts of available reference materials. These abstracts often contain distilled information on topics of discussion.

Before beginning your search for information, it is important for you to realize that restless leg syndrome is considered a relatively uncommon condition. Because of this, far less research is conducted on restless leg syndrome compared to other health problems afflicting larger populations, like breast cancer or heart disease. Nevertheless, this sourcebook will prove useful for two reasons. First, if more information does become available on restless leg syndrome, the sources given in this book will be the most likely to report or make such information available. Second, some will find it important to know about patient support, symptom management, or diagnostic procedures that may be relevant to both restless leg syndrome and other conditions. By using the sources listed in the following chapters, self-directed research can be conducted on broader topics that are related to restless leg syndrome but not readily uncovered using general Internet search engines (e.g. www.google.com or www.yahoo.com). In this way, we have designed this sourcebook to complement these general search engines that can provide useful information and access to online patient support groups.⁵

While we focus on the more scientific aspects of restless leg syndrome, there is, of course, the emotional side to consider. Later in the sourcebook, we provide a chapter dedicated to helping you find peer groups and associations that can provide additional support beyond research

⁵ For example, one can simply go to www.google.com, or other general search engines (e.g. www.yahoo.com, www.aol.com, www.msn.com) and type in “[restless leg syndrome support group](#)” to find any active online support groups dedicated to [restless leg syndrome](#).

produced by medical science. We hope that the choices we have made give you the most options available in moving forward. In this way, we wish you the best in your efforts to incorporate this educational approach into your treatment plan.

The Editors

PART I: THE ESSENTIALS

ABOUT PART I

Part I has been edited to give you access to what we feel are “the essentials” on restless leg syndrome. The essentials of a disease typically include the definition or description of the disease, a discussion of who it affects, the signs or symptoms associated with the disease, tests or diagnostic procedures that might be specific to the disease, and treatments for the disease. Your doctor or healthcare provider may have already explained the essentials of restless leg syndrome to you or even given you a pamphlet or brochure describing restless leg syndrome. Now you are searching for more in-depth information. As editors, we have decided, nevertheless, to include a discussion on where to find essential information that can complement what your doctor has already told you. In this section we recommend a process, not a particular Web site or reference book. The process ensures that, as you search the Web, you gain background information in such a way as to maximize your understanding.

CHAPTER 1. THE ESSENTIALS ON RESTLESS LEG SYNDROME: GUIDELINES

Overview

Official agencies, as well as federally-funded institutions supported by national grants, frequently publish a variety of guidelines on restless leg syndrome. These are typically called “Fact Sheets” or “Guidelines.” They can take the form of a brochure, information kit, pamphlet, or flyer. Often they are only a few pages in length. The great advantage of guidelines over other sources is that they are often written with the patient in mind. Since new guidelines on restless leg syndrome can appear at any moment and be published by a number of sources, the best approach to finding guidelines is to systematically scan the Internet-based services that post them.

The National Institutes of Health (NIH)⁶

The National Institutes of Health (NIH) is the first place to search for relatively current patient guidelines and fact sheets on restless leg syndrome. Originally founded in 1887, the NIH is one of the world’s foremost medical research centers and the federal focal point for medical research in the United States. At any given time, the NIH supports some 35,000 research grants at universities, medical schools, and other research and training institutions, both nationally and internationally. The rosters of those who have conducted research or who have received NIH support over the years include the world’s most illustrious scientists and physicians. Among them are 97 scientists who have won the Nobel Prize for achievement in medicine.

⁶ Adapted from the NIH: <http://www.nih.gov/about/NIHoverview.html>.

There is no guarantee that any one Institute will have a guideline on a specific disease, though the National Institutes of Health collectively publish over 600 guidelines for both common and rare diseases. The best way to access NIH guidelines is via the Internet. Although the NIH is organized into many different Institutes and Offices, the following is a list of key Web sites where you are most likely to find NIH clinical guidelines and publications dealing with restless leg syndrome and associated conditions:

- Office of the Director (OD); guidelines consolidated across agencies available at <http://www.nih.gov/health/consumer/conkey.htm>
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines available at <http://www.nlm.nih.gov/medlineplus/healthtopics.html>
- National Heart, Lung, and Blood Institute (NHLBI); guidelines at <http://www.nhlbi.nih.gov/guidelines/index.htm>

Among these, the National Heart, Lung, and Blood Institute (NHLBI) is particularly noteworthy. The NHLBI provides leadership for a national program in diseases of the heart, blood vessels, lung, and blood; blood resources; and sleep disorders.⁷ Since October 1997, the NHLBI has also had administrative responsibility for the NIH Woman's Health Initiative. The Institute plans, conducts, fosters, and supports an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects. Research is related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases; and sleep disorders. The NHLBI plans and directs research in development and evaluation of interventions and devices related to prevention, treatment, and rehabilitation of patients suffering from such diseases and disorders. It also supports research on clinical use of blood and all aspects of the management of blood resources. Research is conducted in the Institute's own laboratories and by scientific institutions and individuals supported by research grants and contracts. For health professionals and the public, the NHLBI conducts educational activities, including development and dissemination of materials in the above areas, with an emphasis on prevention.

Within the NHLBI, the National Center on Sleep Disorders Research (NCSDR) was established in 1993 to combat a serious public health concern.⁸

⁷ This paragraph has been adapted from the NHLBI:

<http://www.nhlbi.nih.gov/about/org/mission.htm>. "Adapted" signifies that a passage is reproduced exactly or slightly edited for this book.

⁸ This paragraph has been adapted from the NCSDR:

<http://www.nhlbisupport.com/sleep/about/about.htm>.

About 70 million Americans suffer from sleep problems; among them, nearly 60 percent have a chronic disorder. Each year, sleep disorders, sleep deprivation, and sleepiness add an estimated \$15.9 billion to the national healthcare bill. Additional costs to society for related health problems, lost worker productivity, and accidents have not been calculated. Sleep disorders and disturbances of sleep comprise a broad range of problems, including sleep apnea, narcolepsy, insomnia, parasomnia, jet-lag syndrome, and disturbed biological and circadian rhythms. The Center seeks to fulfill its goal of improving the health of Americans by serving four key functions: research, training, technology transfer, and coordination.

- **Research:** Sleep disorders span many medical fields, requiring multidisciplinary approaches not only to treatment, but also to basic research. The Center works with neuroscientists, cellular and molecular biologists, geneticists, physiologists, neuropsychiatrists, immunologists, pulmonary specialists, cardiologists, epidemiologists, behavioral scientists, and other experts. Ongoing research is supported by the NIH and other Federal agencies.
- **Training:** Training researchers in sleep disorders is rigorous and time-consuming. The Center seeks to support and promote formal training programs on the doctoral and postdoctoral levels. It also plans to expand existing career development paths and create new training programs for scientists in sleep disorders research.
- **Technology Transfer:** The Center seeks to ensure that research results lead to health benefits. It works towards this goal by educating health care professionals about sleep disorders and research findings, encouraging medical schools to add sleep disorders to their curricula, working with leading experts to develop clinical guidelines, and sponsoring continuing medical education programs.
- **Coordination:** The Center coordinates the Federal Government's efforts on sleep disorders and works closely with other public, private, and nonprofit groups. The Center works to share information among these groups and encourage their cooperation, especially in crosscutting areas. It also seeks to improve communication among scientists, policymakers, and health care professionals.

The following patient guideline was recently published by the NHLBI and the NCSDR on restless leg syndrome.

What Is Restless Legs Syndrome?⁹

Restless legs syndrome (RLS) is a sleep disorder in which a person experiences unpleasant sensations in the legs described as creeping, crawling, tingling, pulling, or painful. These sensations usually occur in the calf area but may be felt anywhere from the thigh to the ankle. One or both legs may be affected; for some people, the sensations are also felt in the arms. These sensations occur when the person with RLS lies down or sits for prolonged periods of time, such as at a desk, riding in a car, or watching a movie. People with RLS describe an irresistible urge to move the legs when the sensations occur. Usually, moving the legs, walking, rubbing or massaging the legs, or doing knee bends can bring relief, at least briefly.

RLS symptoms worsen during periods of relaxation and decreased activity. RLS symptoms also tend to follow a set daily cycle, with the evening and night hours being more troublesome for RLS sufferers than the morning hours. People with RLS may find it difficult to relax and fall asleep because of their strong urge to walk or do other activities to relieve the sensations in their legs. Persons with RLS often sleep best toward the end of the night or during the morning hours. Because of less sleep at night, people with RLS may feel sleepy during the day on an occasional or regular basis. The severity of symptoms varies from night to night and over the years as well. For some individuals, there may be periods when RLS does not cause problems, but the symptoms usually return. Other people may experience severe symptoms daily.

Many people with RLS also have a related sleep disorder called periodic limb movements in sleep (PLMS). PLMS is characterized by involuntary jerking or bending leg movements during sleep that typically occur every 10 to 60 seconds. Some people may experience hundreds of such movements per night, which can wake them, disturb their sleep, and awaken bed partners. People who have RLS and PLMS have trouble both falling asleep and staying asleep and may experience extreme sleepiness during the day. As a result of problems both in sleeping and while awake, people with RLS may have difficulties with their job, social life, and recreational activities.

⁹ Adapted from the National Heart, Lung, and Blood Institute:
<http://www.nhlbi.nih.gov/health/public/sleep/rls.htm>.

Common Characteristics of Restless Legs Syndrome

Some common symptoms of RLS include:

- Unpleasant sensations in the legs (sometimes the arms as well), often described as creeping, crawling, tingling, pulling, or painful
- Leg sensations are relieved by walking, stretching, knee bends, massage, or hot or cold baths
- Leg discomfort occurs when lying down or sitting for prolonged periods of time
- The symptoms are worse in the evening and during the night.

Other possible characteristics include:

- Involuntary leg (and occasionally arm) movements while asleep
- Difficulty falling asleep or staying asleep
- Sleepiness or fatigue during the daytime
- Cause of the leg discomfort not detected by medical tests
- Family members with similar symptoms

What Causes RLS?

Although the cause is unknown in most cases, certain factors may be associated with RLS:

- Family history. RLS is known to run in some families--parents may pass the condition on to their children.
- Pregnancy. Some women experience RLS during pregnancy, especially in the last months. The symptoms usually disappear after delivery.
- Low iron levels or anemia. Persons with these conditions may be prone to developing RLS. The symptoms may improve once the iron level or anemia is corrected.
- Chronic diseases. Kidney failure quite often leads to RLS. Other chronic diseases such as diabetes, rheumatoid arthritis, and peripheral neuropathy may also be associated with RLS.
- Caffeine intake. Decreasing caffeine consumption may improve symptoms.

Who Gets RLS?

RLS occurs in both sexes. Symptoms can begin any time, but are usually more common and more severe among older people. Young people who experience symptoms of RLS are sometimes thought to have “growing pains” or may be considered “hyperactive” because they cannot easily sit still in school.

How Is RLS Diagnosed?

There is no laboratory test that can make a diagnosis of RLS and, when someone with RLS goes to see a doctor, there is usually nothing abnormal the doctor can see or detect on examination. Diagnosis therefore depends on what a person describes to the doctor. The history usually includes a description of the typical leg sensations that lead to an urge to move the legs or walk. These sensations are noted to worsen when the legs are at rest, for example, when sitting or lying down and during the evening and night. The person with RLS may complain about trouble sleeping or daytime sleepiness. In some cases, the bed partner will complain about the person’s leg movements and jerking during the night.

To help make a diagnosis, the doctor may ask about all current and past medical problems, family history, and current medications. A complete physical and neurological exam may help identify other conditions that may be associated with RLS, such as nerve damage (neuropathy or a pinched nerve) or abnormalities in the blood vessels. Basic laboratory tests may be done to assess general health and to rule out anemia. Further studies depend on initial findings. In some cases, a doctor may suggest an overnight sleep study to determine whether PLMS or other sleep problems are present. In most people with RLS, no new medical problem will be discovered during the physical exam or on any tests, except the sleep study, which will detect PLMS if present.

How Is RLS Treated?

In mild cases of RLS, some people find that activities such as taking a hot bath, massaging the legs, using a heating pad or ice pack, exercising, and eliminating caffeine help alleviate symptoms. In more severe cases, medications are prescribed to control symptoms. Unfortunately, no one drug is effective for everyone with RLS. Individuals respond differently to

medications based on the severity of symptoms, other medical conditions, and other medications being taken. A medication that is initially found to be effective may lose its effectiveness with nightly use; thus, it may be necessary to alternate between different categories of medication in order to keep symptoms under control.

Although many different drugs may help RLS, those most commonly used are found in the following three categories:

- Benzodiazepines are central nervous system depressants that do not fully suppress RLS sensations or leg movements, but allow patients to obtain more sleep despite these problems. Some drugs in this group may result in daytime drowsiness. Benzodiazepines should not be used by people with sleep apnea.
- Dopaminergic agents are drugs used to treat Parkinson's disease and are also effective for many people with RLS and PLMS. These medications have been shown to reduce RLS symptoms and nighttime leg movements.
- Opioids are pain-killing and relaxing drugs that can suppress RLS and PLMS in some people. These medications can sometimes help people with severe, unrelenting symptoms.

Although there is some potential for benzodiazepines and opioids to become habit forming, this usually does not occur with the dosages given to most RLS patients.

A nondrug approach called transcutaneous electric nerve stimulation may improve symptoms in some RLS sufferers who also have PLMS. The electrical stimulation is applied to an area of the legs or feet, usually before bedtime, for 15 to 30 minutes. This approach has been shown to be helpful in reducing nighttime leg jerking.

Due to recent advances, doctors today have a variety of means for treating RLS. However, no perfect treatment exists and there is much more to be learned about the treatments that currently seem to be successful.

For More Information

For additional information on sleep and sleep disorders, contact the following offices of the National Heart, Lung, and Blood Institute of the National Institutes of Health:

National Center on Sleep Disorders Research

Two Rockledge Centre

Suite 7024

6701 Rockledge Drive, MSC 7920

Bethesda, MD 20892-7920

(301) 435-0199

(301) 480-3451 (fax)

The NCSDR supports research, scientist training, dissemination of health information, and other activities on sleep and sleep disorders. The NCSDR also coordinates sleep research activities with other Federal agencies and with public and nonprofit organizations.

National Heart, Lung, and Blood Institute Information Center

P.O. Box 30105

Bethesda, MD 20824-0105

(301) 592-8573

(301) 592-8563 (fax)

The Information Center acquires, analyzes, promotes, maintains, and disseminates programmatic and educational information related to sleep and sleep disorders. Write for a list of available publications or to order additional copies of this fact sheet.

To learn more about RLS, contact the Restless Legs Syndrome Foundation, Inc., a nonprofit organization dedicated to helping the public, patients, families, and physicians better understand RLS. The Foundation can be reached at:

Restless Legs Syndrome Foundation

819 Second Street SW

Rochester, Minnesota 55902-2985

<http://www.rls.org>

More Guideline Sources

The guideline above on restless leg syndrome is only one example of the kind of material that you can find online and free of charge. The remainder of this chapter will direct you to other sources which either publish or can

help you find additional guidelines on topics related to restless leg syndrome. Many of the guidelines listed below address topics that may be of particular relevance to your specific situation or of special interest to only some patients with restless leg syndrome. Due to space limitations these sources are listed in a concise manner. Do not hesitate to consult the following sources by either using the Internet hyperlink provided, or, in cases where the contact information is provided, contacting the publisher or author directly.

Topic Pages: MEDLINEplus

For patients wishing to go beyond guidelines published by specific Institutes of the NIH, the National Library of Medicine has created a vast and patient-oriented healthcare information portal called MEDLINEplus. Within this Internet-based system are “health topic pages.” You can think of a health topic page as a guide to patient guides. To access this system, log on to <http://www.nlm.nih.gov/medlineplus/healthtopics.html>. From there you can either search using the alphabetical index or browse by broad topic areas.

If you do not find topics of interest when browsing health topic pages, then you can choose to use the advanced search utility of MEDLINEplus at <http://www.nlm.nih.gov/medlineplus/advancedsearch.html>. This utility is similar to the NIH Search Utility, with the exception that it only includes material linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The National Guideline Clearinghouse™

The National Guideline Clearinghouse™ offers hundreds of evidence-based clinical practice guidelines published in the United States and other countries. You can search their site located at <http://www.guideline.gov> by using the keyword “restless leg syndrome” or synonyms. The following was recently posted:

- **Practice parameters for the evaluation of chronic insomnia.**

Source: American Academy of Sleep Medicine.; 1999; 5 pages

http://www.guideline.gov/FRAMESETS/guideline_fs.asp?guideline=001502&sSearch_string=restless+leg+syndrome

- **Practice parameters for the indications for polysomnography and related procedures.**

Source: American Academy of Sleep Medicine.; 1997 (reviewed 2000); 17 pages

http://www.guideline.gov/FRAMESETS/guideline_fs.asp?guideline=000902&sSearch_string=restless+leg+syndrome

- **Practice parameters for the treatment of restless legs syndrome and periodic limb movement disorder.**

Source: American Academy of Sleep Medicine.; 1999; 8 pages

http://www.guideline.gov/FRAMESETS/guideline_fs.asp?guideline=001500&sSearch_string=restless+leg+syndrome

Healthfinder™

Healthfinder™ is an additional source sponsored by the U.S. Department of Health and Human Services which offers links to hundreds of other sites that contain healthcare information. This Web site is located at **<http://www.healthfinder.gov>**. Again, keyword searches can be used to find guidelines. The following was recently found in this database:

- **Back to Sleep Campaign**

Summary: This website offers information for parents and health professionals on sudden infant death syndrome. Some materials are available in Spanish.

Source: National Institute of Child Health and Human Development, National Institutes of Health

<http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=409>

- **Brain Basics: Sleep**

Summary: This brochure presents a general overview of sleep and the effects of sleep on our daily functioning and our physical and mental health.

Source: National Institute of Neurological Disorders and Stroke, National Institutes of Health

<http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=791>

- **Childhood Nephrotic Syndrome**

Summary: Describes childhood nephrotic syndrome, minimal change disease, and other conditions that involve the childhood nephrotic syndrome.

Source: National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health

<http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=6494>

- **Chronic Fatigue Syndrome**

Summary: This fact sheet on chronic fatigue syndrome describes the illness and its causes, symptoms, diagnosis, and management.

Source: National Institute of Allergy and Infectious Diseases, National Institutes of Health

<http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=240>

- **Chronic Fatigue Syndrome (CFS) Home Page - Centers for Disease Control and Prevention (CDC)**

Summary: The cause of Chronic Fatigue Syndrome (CFS) has not been identified, but there are several theories.

Source: National Center for Infectious Diseases, Centers for Disease Control and Prevention

<http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=1385>

The NIH Search Utility

After browsing the references listed at the beginning of this chapter, you may want to explore the NIH Search Utility. This allows you to search for documents on over 100 selected Web sites that comprise the NIH-WEBSPACE. Each of these servers is “crawled” and indexed on an ongoing basis. Your search will produce a list of various documents, all of which will relate in some way to restless leg syndrome. The drawbacks of this approach are that the information is not organized by theme and that the references are often a mix of information for professionals and patients. Nevertheless, a

large number of the listed Web sites provide useful background information. We can only recommend this route, therefore, for relatively rare or specific disorders, or when using highly targeted searches. To use the NIH search utility, visit the following Web page: <http://search.nih.gov/index.html>.

Additional Web Sources

A number of Web sites that often link to government sites are available to the public. These can also point you in the direction of essential information. The following is a representative sample:

- AOL: <http://search.aol.com/cat.adp?id=168&layer=&from=subcats>
- drkoop.com[®]: <http://www.drkoop.com/conditions/ency/index.html>
- Family Village: <http://www.familyvillage.wisc.edu/specific.htm>
- Google:
http://directory.google.com/Top/Health/Conditions_and_Diseases/
- Med Help International: <http://www.medhelp.org/HealthTopics/A.html>
- Open Directory Project:
http://dmoz.org/Health/Conditions_and_Diseases/
- Yahoo.com: http://dir.yahoo.com/Health/Diseases_and_Conditions/
- WebMD[®]Health: http://my.webmd.com/health_topics

Vocabulary Builder

The material in this chapter may have contained a number of unfamiliar words. The following Vocabulary Builder introduces you to terms used in this chapter that have not been covered in the previous chapter:

American Heart Association: A voluntary organization concerned with the prevention and treatment of heart and vascular diseases. [NIH]

Anemia: A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin. [NIH]

Apnea: A transient absence of spontaneous respiration. [NIH]

Benzodiazepines: A two-ring heterocyclic compound consisting of a benzene ring fused to a diazepine ring. Permitted is any degree of hydrogenation, any substituents and any H-isomer. [NIH]

Bloom Syndrome: An autosomal recessive disorder characterized by

telangiectatic erythema of the face, photosensitivity, dwarfism, and other abnormalities. [NIH]

Cardiopulmonary: Pertaining to the heart and lungs. [EU]

Chronic: Of long duration; frequently recurring. [NIH]

Deprivation: Loss or absence of parts, organs, powers, or things that are needed. [EU]

Fatigue: The state of weariness following a period of exertion, mental or physical, characterized by a decreased capacity for work and reduced efficiency to respond to stimuli. [NIH]

Insomnia: Inability to sleep; abnormal wakefulness. [EU]

Lactation: The period of the secretion of milk. [EU]

Mental: Pertaining to the mind; psychic. 2. (L. mentum chin) pertaining to the chin. [EU]

Molecular: Of, pertaining to, or composed of molecules : a very small mass of matter. [EU]

Nephrotic: Pertaining to, resembling, or caused by nephrosis. [EU]

Orthopaedic: Pertaining to the correction of deformities of the musculoskeletal system; pertaining to orthopaedics. [EU]

Pulmonary: Relating to the lungs. [NIH]

Resuscitation: The restoration to life or consciousness of one apparently dead; it includes such measures as artificial respiration and cardiac massage. [EU]

Rheumatoid: Resembling rheumatism. [EU]

Stroke: Sudden loss of function of part of the brain because of loss of blood flow. Stroke may be caused by a clot (thrombosis) or rupture (hemorrhage) of a blood vessel to the brain. [NIH]

CHAPTER 2. SEEKING GUIDANCE

Overview

Some patients are comforted by the knowledge that a number of organizations dedicate their resources to helping people with restless leg syndrome. These associations can become invaluable sources of information and advice. Many associations offer aftercare support, financial assistance, and other important services. Furthermore, healthcare research has shown that support groups often help people to better cope with their conditions.¹⁰ In addition to support groups, your physician can be a valuable source of guidance and support. Therefore, finding a physician that can work with your unique situation is a very important aspect of your care.

In this chapter, we direct you to resources that can help you find patient organizations and medical specialists. We begin by describing how to find associations and peer groups that can help you better understand and cope with restless leg syndrome. The chapter ends with a discussion on how to find a doctor that is right for you.

Associations and Restless Leg Syndrome

As mentioned by the Agency for Healthcare Research and Quality, sometimes the emotional side of an illness can be as taxing as the physical side.¹¹ You may have fears or feel overwhelmed by your situation. Everyone has different ways of dealing with disease or physical injury. Your attitude, your expectations, and how well you cope with your condition can all

¹⁰ Churches, synagogues, and other houses of worship might also have groups that can offer you the social support you need.

¹¹ This section has been adapted from <http://www.ahcpr.gov/consumer/diaginf5.htm>.

influence your well-being. This is true for both minor conditions and serious illnesses. For example, a study on female breast cancer survivors revealed that women who participated in support groups lived longer and experienced better quality of life when compared with women who did not participate. In the support group, women learned coping skills and had the opportunity to share their feelings with other women in the same situation. There are a number of directories that list additional medical associations that you may find useful. While not all of these directories will provide different information, by consulting all of them, you will have nearly exhausted all sources for patient associations.

The National Health Information Center (NHIC)

The National Health Information Center (NHIC) offers a free referral service to help people find organizations that provide information about restless leg syndrome. For more information, see the NHIC's Web site at **<http://www.health.gov/NHIC/>** or contact an information specialist by calling 1-800-336-4797.

DIRLINE

A comprehensive source of information on associations is the DIRLINE database maintained by the National Library of Medicine. The database comprises some 10,000 records of organizations, research centers, and government institutes and associations which primarily focus on health and biomedicine. DIRLINE is available via the Internet at the following Web site: **<http://dirline.nlm.nih.gov/>**. Simply type in "restless leg syndrome" (or a synonym) or the name of a topic, and the site will list information contained in the database on all relevant organizations.

The Combined Health Information Database

Another comprehensive source of information on healthcare associations is the Combined Health Information Database. Using the "Detailed Search" option, you will need to limit your search to "Organizations" and "restless leg syndrome". Type the following hyperlink into your Web browser: **<http://chid.nih.gov/detail/detail.html>**. To find associations, use the drop boxes at the bottom of the search page where "You may refine your search by." For publication date, select "All Years." Then, select your preferred language and the format option "Organization Resource Sheet." By making

these selections and typing in “restless leg syndrome” (or synonyms) into the “For these words:” box, you will only receive results on organizations dealing with restless leg syndrome. You should check back periodically with this database since it is updated every 3 months.

The National Organization for Rare Disorders, Inc.

The National Organization for Rare Disorders, Inc. has prepared a Web site that provides, at no charge, lists of associations organized by specific diseases. You can access this database at the following Web site: **<http://www.rarediseases.org/cgi-bin/nord/searchpage>**. Select the option called “Organizational Database (ODB)” and type “restless leg syndrome” (or a synonym) in the search box.

Online Support Groups

In addition to support groups, commercial Internet service providers offer forums and chat rooms for people with different illnesses and conditions. WebMD®, for example, offers such a service at their Web site: **<http://boards.webmd.com/roundtable>**. These online self-help communities can help you connect with a network of people whose concerns are similar to yours. Online support groups are places where people can talk informally. If you read about a novel approach, consult with your doctor or other healthcare providers, as the treatments or discoveries you hear about may not be scientifically proven to be safe and effective.

- **Restless Legs Syndrome Foundation**
<http://www.rls.org/>
- **Restless Leg Syndrome Message Board**
<http://www.healthboards.com/restless-leg-syndrome>
- **The Southern California RLS Support Group**
<http://surf.to/rls>

Finding Doctors

One of the most important aspects of your treatment will be the relationship between you and your doctor or specialist. All patients with restless leg syndrome must go through the process of selecting a physician. While this

process will vary from person to person, the Agency for Healthcare Research and Quality makes a number of suggestions, including the following:¹²

- If you are in a managed care plan, check the plan's list of doctors first.
- Ask doctors or other health professionals who work with doctors, such as hospital nurses, for referrals.
- Call a hospital's doctor referral service, but keep in mind that these services usually refer you to doctors on staff at that particular hospital. The services do not have information on the quality of care that these doctors provide.
- Some local medical societies offer lists of member doctors. Again, these lists do not have information on the quality of care that these doctors provide.

Additional steps you can take to locate doctors include the following:

- Check with the associations listed earlier in this chapter.
- Information on doctors in some states is available on the Internet at **<http://www.docboard.org>**. This Web site is run by "Administrators in Medicine," a group of state medical board directors.
- The American Board of Medical Specialties can tell you if your doctor is board certified. "Certified" means that the doctor has completed a training program in a specialty and has passed an exam, or "board," to assess his or her knowledge, skills, and experience to provide quality patient care in that specialty. Primary care doctors may also be certified as specialists. The AMBS Web site is located at **<http://www.abms.org/newsearch.asp>**.¹³ You can also contact the ABMS by phone at 1-866-ASK-ABMS.
- You can call the American Medical Association (AMA) at 800-665-2882 for information on training, specialties, and board certification for many licensed doctors in the United States. This information also can be found in "Physician Select" at the AMA's Web site: **<http://www.ama-assn.org/aps/amahg.htm>**.

If the previous sources did not meet your needs, you may want to log on to the Web site of the National Organization for Rare Disorders (NORD) at **<http://www.rarediseases.org/>**. NORD maintains a database of doctors with expertise in various rare diseases. The Metabolic Information Network

¹² This section is adapted from the AHRQ: **www.ahrq.gov/consumer/qntascii/qntdr.htm**.

¹³ While board certification is a good measure of a doctor's knowledge, it is possible to receive quality care from doctors who are not board certified.

(MIN), 800-945-2188, also maintains a database of physicians with expertise in various metabolic diseases.

Selecting Your Doctor¹⁴

When you have compiled a list of prospective doctors, call each of their offices. First, ask if the doctor accepts your health insurance plan and if he or she is taking new patients. If the doctor is not covered by your plan, ask yourself if you are prepared to pay the extra costs. The next step is to schedule a visit with your chosen physician. During the first visit you will have the opportunity to evaluate your doctor and to find out if you feel comfortable with him or her. Ask yourself, did the doctor:

- Give me a chance to ask questions about restless leg syndrome?
- Really listen to my questions?
- Answer in terms I understood?
- Show respect for me?
- Ask me questions?
- Make me feel comfortable?
- Address the health problem(s) I came with?
- Ask me my preferences about different kinds of treatments for restless leg syndrome?
- Spend enough time with me?

Trust your instincts when deciding if the doctor is right for you. But remember, it might take time for the relationship to develop. It takes more than one visit for you and your doctor to get to know each other.

¹⁴ This section has been adapted from the AHRQ:
www.ahrq.gov/consumer/qntascii/qntdr.htm.

Working with Your Doctor¹⁵

Research has shown that patients who have good relationships with their doctors tend to be more satisfied with their care and have better results. Here are some tips to help you and your doctor become partners:

- You know important things about your symptoms and your health history. Tell your doctor what you think he or she needs to know.
- It is important to tell your doctor personal information, even if it makes you feel embarrassed or uncomfortable.
- Bring a “health history” list with you (and keep it up to date).
- Always bring any medications you are currently taking with you to the appointment, or you can bring a list of your medications including dosage and frequency information. Talk about any allergies or reactions you have had to your medications.
- Tell your doctor about any natural or alternative medicines you are taking.
- Bring other medical information, such as x-ray films, test results, and medical records.
- Ask questions. If you don’t, your doctor will assume that you understood everything that was said.
- Write down your questions before your visit. List the most important ones first to make sure that they are addressed.
- Consider bringing a friend with you to the appointment to help you ask questions. This person can also help you understand and/or remember the answers.
- Ask your doctor to draw pictures if you think that this would help you understand.
- Take notes. Some doctors do not mind if you bring a tape recorder to help you remember things, but always ask first.
- Let your doctor know if you need more time. If there is not time that day, perhaps you can speak to a nurse or physician assistant on staff or schedule a telephone appointment.
- Take information home. Ask for written instructions. Your doctor may also have brochures and audio and videotapes that can help you.

¹⁵ This section has been adapted from the AHRQ:
www.ahrq.gov/consumer/qntascii/qntdr.htm.

- After leaving the doctor's office, take responsibility for your care. If you have questions, call. If your symptoms get worse or if you have problems with your medication, call. If you had tests and do not hear from your doctor, call for your test results. If your doctor recommended that you have certain tests, schedule an appointment to get them done. If your doctor said you should see an additional specialist, make an appointment.

By following these steps, you will enhance the relationship you will have with your physician.

Broader Health-Related Resources

In addition to the references above, the NIH has set up guidance Web sites that can help patients find healthcare professionals. These include:¹⁶

- Caregivers:
<http://www.nlm.nih.gov/medlineplus/caregivers.html>
- Choosing a Doctor or Healthcare Service:
<http://www.nlm.nih.gov/medlineplus/choosingadoctororhealthcareservice.html>
- Hospitals and Health Facilities:
<http://www.nlm.nih.gov/medlineplus/healthfacilities.html>

¹⁶ You can access this information at:

<http://www.nlm.nih.gov/medlineplus/healthsystem.html>.

PART II: ADDITIONAL RESOURCES AND ADVANCED MATERIAL

ABOUT PART II

In Part II, we introduce you to additional resources and advanced research on restless leg syndrome. All too often, patients who conduct their own research are overwhelmed by the difficulty in finding and organizing information. The purpose of the following chapters is to provide you an organized and structured format to help you find additional information resources on restless leg syndrome. In Part II, as in Part I, our objective is not to interpret the latest advances on restless leg syndrome or render an opinion. Rather, our goal is to give you access to original research and to increase your awareness of sources you may not have already considered. In this way, you will come across the advanced materials often referred to in pamphlets, books, or other general works. Once again, some of this material is technical in nature, so consultation with a professional familiar with restless leg syndrome is suggested.

CHAPTER 3. STUDIES ON RESTLESS LEG SYNDROME

Overview

Every year, academic studies are published on restless leg syndrome or related conditions. Broadly speaking, there are two types of studies. The first are peer reviewed. Generally, the content of these studies has been reviewed by scientists or physicians. Peer-reviewed studies are typically published in scientific journals and are usually available at medical libraries. The second type of studies is non-peer reviewed. These works include summary articles that do not use or report scientific results. These often appear in the popular press, newsletters, or similar periodicals.

In this chapter, we will show you how to locate peer-reviewed references and studies on restless leg syndrome. We will begin by discussing research that has been summarized and is free to view by the public via the Internet. We then show you how to generate a bibliography on restless leg syndrome and teach you how to keep current on new studies as they are published or undertaken by the scientific community.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and restless leg syndrome, you will need to use the advanced search options. First, go to <http://chid.nih.gov/index.html>. From there, select the “Detailed Search” option (or go directly to that page with the following hyperlink: <http://chid.nih.gov/detail/detail.html>). The trick in extracting studies is found in the drop boxes at the bottom of the search page where “You may refine your search by.” Select the dates and language you prefer, and the

format option “Journal Article.” At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display “whole records.” We recommend that you type in “restless leg syndrome” (or synonyms) into the “For these words:” box. Consider using the option “anywhere in record” to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the “Search in these fields” drop box. The following is a sample of what you can expect from this type of search:

- **Sleep Disorders: A Common Problem Among Kidney Patients?**

Source: For Patients Only. 8(1): 8-10, 24. January-February 1995.

Contact: Available from Contemporary Dialysis, Inc. 6300 Variel Avenue, Suite I, Woodland Hills, CA 91367.

Summary: In this article, the author provides readers with information about an often-encountered, but little-discussed complication of dialysis, insomnia. Topics include the adequacy of dialysis and its impact on the sleep habits of patients; restless leg syndrome (RLS) and the role of peripheral neuropathy in its development; the use of Sinemet to treat RLS; using conventional sleep aids, including Ambien; the use of muscle relaxants, or benzodiazepines, for milder forms of RLS; psychological sleep disturbances; and adjunctive therapies, including Qigong, biofeedback, and meditation. The author encourages readers to become more self-aware and to participate as an active member of their own health care team. The article includes a short list of references and organizations that may provide additional information about sleep disorders and their therapy.

Federally-Funded Research on Restless Leg Syndrome

The U.S. Government supports a variety of research studies relating to restless leg syndrome and associated conditions. These studies are tracked by the Office of Extramural Research at the National Institutes of Health.¹⁷ CRISP (Computerized Retrieval of Information on Scientific Projects) is a searchable database of federally-funded biomedical research projects

¹⁷ Healthcare projects are funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), Agency for Healthcare Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH).

conducted at universities, hospitals, and other institutions. Visit the CRISP Web site at http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket. You can perform targeted searches by various criteria including geography, date, as well as topics related to restless leg syndrome and related conditions.

For most of the studies, the agencies reporting into CRISP provide summaries or abstracts. As opposed to clinical trial research using patients, many federally-funded studies use animals or simulated models to explore restless leg syndrome and related conditions. In some cases, therefore, it may be difficult to understand how some basic or fundamental research could eventually translate into medical practice. The following sample is typical of the type of information found when searching the CRISP database for restless leg syndrome:

- **Project Title: Etiology of Restless Leg Syndrome, A Sleep Disorder**

Principal Investigator & Institution: Rouleau, Guy A.; Associate Professor; Montreal General Hospital 1650 Cedar Ave Montreal,

Timing: Fiscal Year 2000; Project Start 0-SEP-1999; Project End 1-JUL-2002

Summary: Restless leg syndrome (RLS) is a common sleep disorder characterized by unpleasant sensations in the lower limbs that occur at rest and are relieved by movement. Several studies have reported familial aggregation of RLS and have frequently suggested that it segregates as an autosomal dominant trait, with a recurrence risk among first-degree relatives of RLS probands as high as 40 percent. RLS patients with a positive family history have a tendency to an earlier age of onset, which also suggests an important genetic component in the etiology of RLS. Our hypothesis is that at least part of the observed familial aggregation seen in RLS is due to genetic factors. Our goal is to map the gene (or genes) that predispose to familial RLS using subjects from a homogeneous population with a founder effect where RLS prevalence rates have been shown to be increased. In addition, we will replicate positive findings in independent samples from French-Canadian and panmixed populations, and subsequently, identify the gene (or genes). Specifically, we will: (1) Collect unrelated French-Canadian patients and families of probands affected with RLS defined according to stringent criteria; (2) Collect RLS families from panmixed populations; (3) Conduct a systematic scan of the whole human genome in French-Canadian families using traditional lod score and nonparametric linkage analysis in order to identify loci that may be implicated in the etiology of RLS; (4) Replicate the positive findings using two different samples: a) unrelated RLS patients of French-Canadian origin, and b) a collection of large and nuclear families from panmixed populations; (5) Identify the RLS gene. In addition to

better define the disease, the identification of a gene that contributes to the etiology of RLS may lead to new insights into the mechanisms of the sleep processes and episodic movements. Furthermore, finding a predisposing gene may lead to improved treatment of RLS and related conditions. The proposed investigation will be carried out in a three year period.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: Hypocretins and Their Role in the Control Of Sleep**

Principal Investigator & Institution: Maki, Richard A.; Senior Staff Scientist; Neurocrine Biosciences, Inc. 10555 Science Center Dr San Diego, Ca 92121

Timing: Fiscal Year 2001; Project Start 5-SEP-2001; Project End 1-AUG-2002

Summary: DESCRIPTION: (Adapted from the Applicant's Abstract) Insomnia is one of the more prevalent sleep disorders in the US, affecting about 10 percent of the population. Other sleep disorders include obstructive sleep apnea, restless leg syndrome and narcolepsy. Recently, a mutation in the G-protein coupled receptor hypocretin receptor-2 has been linked to the development of narcolepsy in dogs. In addition, the disruption of a gene in mice for the neuropeptide hypocretin led to the development of narcolepsy in those mice. These two results have focused attention on the hypocretin system as an important modulator of sleep in humans. The applicant organization, Neurocrine Biosciences, has developed a series of small molecule antagonists to the hypocretin receptor-2. The focus of this application is to first characterize these small molecule antagonists in vitro. The antagonists will be tested in competitive binding assays and cell-based functional assays. Second, the small molecule antagonists will be tested in vivo. Both rat and dog models will be set up and evaluated for the effect of the small molecule antagonists on sleep and wakefulness. The specificity of the effects of the small molecule antagonists will be further evaluated by comparing normal dogs with hypocretin receptor-2 mutated narcoleptic dogs. The results of this study will be valuable in determining the effectiveness of a hypocretin receptor antagonist in the control of sleep. These studies will also help to prepare the groundwork for the future development of hypocretin receptor-2 agonist as a possible treatment for narcolepsy. Proposed Commercial Application: A potential application for the research proposed is in the field of insomnia (an estimated 10% of the population suffers from chronic insomnia). Based on the available data, it is reasonable to hypothesize that hypocretin receptor antagonists will promote non-REM and REM sleep.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

- **Project Title: K⁺-Channels Regulating Rem-Related Cholinergic Neurons**

Principal Investigator & Institution: Leonard, Christopher S.; Profesor; Physiology; New York Medical College Elmwood Hall Valhalla, Ny 10595

Timing: Fiscal Year 2000; Project Start 0-SEP-1999; Project End 1-AUG-2003

Summary: How and why we sleep are central unsolved questions in medicine. Nearly 40 million people in the United States are estimated to experience chronic or intermittent sleep disorders such as narcolepsy, sleep apnea, restless leg syndrome and insomnia. Traditional approaches have identified several neuronal populations whose interplay is important in generating sleep and wakefulness. How that interplay is established, how it is altered and its cellular and molecular consequences, remain poorly understood. The long-term objective of this proposal is to determine the molecular identity and function of ion channels and receptors expressed by sleep-related neurons in order to understand the molecular mechanisms controlling sleep generation. This application focuses on the identity and function of a family of K⁺ channels subunit genes in controlling activity of mesopontine cholinergic neurons which are believed to play a pivotal role in the generation of wakefulness and REM sleep. Our central hypothesis is that K⁺ channels formed by Kv3 subunits regulate action potential shape, intracellular Ca²⁺ levels, repetitive firing and the release of transmitter from mesopontine cholinergic neurons. To test this hypothesis we will use pharmacological methods with whole-cell patch clamp recordings in brain slices from wild-type and Kv3 knock-out mice. The results of these studies will 1) identify and verify the intrinsic electrophysiological properties of important REM-sleep related neurons in mouse; 2) determine the molecular identity and function of native K⁺ channels formed by Kv3 subunits; 3) elucidate new mechanisms controlling the activity and release of transmitter by REM sleep-related neurons; 4) identify novel functions of Kv3 channels which have previously been associated with the fast-spiking phenotype rather than broad-spiking phenotype of brainstem cholinergic neurons. These results will contribute to our understanding of the molecular basis of sleep regulation as well as advancing the mouse as a platform for future sleep research.

Website: http://commons.cit.nih.gov/crisp3/CRISP.Generate_Ticket

The National Library of Medicine: PubMed

One of the quickest and most comprehensive ways to find academic studies in both English and other languages is to use PubMed, maintained by the National Library of Medicine. The advantage of PubMed over previously mentioned sources is that it covers a greater number of domestic and foreign references. It is also free to the public.¹⁸ If the publisher has a Web site that offers full text of its journals, PubMed will provide links to that site, as well as to sites offering other related data. User registration, a subscription fee, or some other type of fee may be required to access the full text of articles in some journals.

To generate your own bibliography of studies dealing with restless leg syndrome, simply go to the PubMed Web site at **www.ncbi.nlm.nih.gov/pubmed**. Type “restless leg syndrome” (or synonyms) into the search box, and click “Go.” The following is the type of output you can expect from PubMed for “restless leg syndrome” (hyperlinks lead to article summaries):

- **Acupuncture treatment of restless leg syndrome.**
 Author(s): Hu J.
 Source: J Tradit Chin Med. 2001 December; 21(4): 312-6. No Abstract Available.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12014138&dopt=Abstract

Vocabulary Builder

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Cholinergic: Resembling acetylcholine in pharmacological action; stimulated by or releasing acetylcholine or a related compound. [EU]

Electrophysiological: Pertaining to electrophysiology, that is a branch of physiology that is concerned with the electric phenomena associated with

¹⁸ PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) at the National Institutes of Health (NIH). The PubMed database was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journal articles at Web sites of participating publishers. Publishers that participate in PubMed supply NLM with their citations electronically prior to or at the time of publication.

living bodies and involved in their functional activity. [EU]

Homogeneous: Consisting of or composed of similar elements or ingredients; of a uniform quality throughout. [EU]

Modulator: A specific inductor that brings out characteristics peculiar to a definite region. [EU]

Neuronal: Pertaining to a neuron or neurons (= conducting cells of the nervous system). [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Phenotype: The entire physical, biochemical, and physiological makeup of an individual as determined by his or her genes and by the environment in the broad sense. [NIH]

Receptor: 1. a molecular structure within a cell or on the surface characterized by (1) selective binding of a specific substance and (2) a specific physiologic effect that accompanies the binding, e.g., cell-surface receptors for peptide hormones, neurotransmitters, antigens, complement fragments, and immunoglobulins and cytoplasmic receptors for steroid hormones. 2. a sensory nerve terminal that responds to stimuli of various kinds. [EU]

Recurrence: The return of a sign, symptom, or disease after a remission. [NIH]

Wakefulness: A state in which there is an enhanced potential for sensitivity and an efficient responsiveness to external stimuli. [NIH]

CHAPTER 4. PATENTS ON RESTLESS LEG SYNDROME

Overview

You can learn about innovations relating to restless leg syndrome by reading recent patents and patent applications. Patents can be physical innovations (e.g. chemicals, pharmaceuticals, medical equipment) or processes (e.g. treatments or diagnostic procedures). The United States Patent and Trademark Office defines a patent as a grant of a property right to the inventor, issued by the Patent and Trademark Office.¹⁹ Patents, therefore, are intellectual property. For the United States, the term of a new patent is 20 years from the date when the patent application was filed. If the inventor wishes to receive economic benefits, it is likely that the invention will become commercially available to patients with restless leg syndrome within 20 years of the initial filing. It is important to understand, therefore, that an inventor's patent does not indicate that a product or service is or will be commercially available to patients with restless leg syndrome. The patent implies only that the inventor has "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States. While this relates to U.S. patents, similar rules govern foreign patents.

In this chapter, we show you how to locate information on patents and their inventors. If you find a patent that is particularly interesting to you, contact the inventor or the assignee for further information.

¹⁹Adapted from The U. S. Patent and Trademark Office:
<http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm>.

Patents on Restless Leg Syndrome

By performing a patent search focusing on restless leg syndrome, you can obtain information such as the title of the invention, the names of the inventor(s), the assignee(s) or the company that owns or controls the patent, a short abstract that summarizes the patent, and a few excerpts from the description of the patent. The abstract of a patent tends to be more technical in nature, while the description is often written for the public. Full patent descriptions contain much more information than is presented here (e.g. claims, references, figures, diagrams, etc.). We will tell you how to obtain this information later in the chapter. The following is an example of the type of information that you can expect to obtain from a patent search on restless leg syndrome:

Patent Applications on Restless Leg Syndrome

As of December 2000, U.S. patent applications are open to public viewing.²⁰ Applications are patent requests which have yet to be granted (the process to achieve a patent can take several years). The following patent applications have been filed since December 2000 relating to restless leg syndrome:

- **Use of valeriana for the treatment of Restless Leg Syndrome and related disorders**

Inventor(s): Hoffman, Keith ; (Del Mar, CA), Loullis, Costas ; (Carlsbad, CA)

Correspondence: Knobbe Martens Olson & Bear LLP; 620 Newport Center Drive; Sixteenth Floor; Newport Beach; CA; 92660; US

Patent Application Number: 20020064569

Date filed: November 28, 2001

Abstract: A method of inhibiting at least one symptomology of Restless Leg Syndrome (RLS) and its related disorders, including disorders such as periodic limb movements in sleep (PLMS) and periodic limb movement disorder (PLMD), is disclosed. The method optionally comprising identifying a host, afflicted with Restless Leg Syndrome (RLS) and its related disorders; and administering to the host a pharmaceutically effective amount of Valeriana. A novel method of inhibiting at least one symptomology of Restless Leg Syndrome (RLS) and its related disorders is disclosed. The method may also be used to treat a host in order to diminish undesired limb movements, and may

²⁰ This has been a common practice outside the United States prior to December 2000.

involve the administration of a particular compound, found in the above-mentioned extracts, preferably selected from the group consisting of 10(14)-Aromadendren-4-ol, 6,10(14)-Guaiadien-4-ol, Valerenal, Valerenol, Valerenic acid, Acetoxyvalerenic acid, Hydroxyvalerenic acid, mimetics thereof, and may involve the administration of a combinations of these particular compounds and mimetics thereof.

Excerpt(s): This invention relates to novel methods for treating Restless Leg Syndrome (RLS) and related disorders, such as periodic limb movements in sleep (PLMS) and periodic limb movement disorder (PLMD), and for diminishing the occurrence of unwanted limb movements. Particularly, this invention relates to the use of Valeriana, and more particularly to an extract of Valeriana officinalis L., for diminishing the occurrence of unwanted limb movements, either associated with or unassociated with RLS and/or related disorders. ... The set of conditions known as Restless Leg Syndrome (RLS), also known as Ekbom's Syndrome following Ekbom's description of the syndrome in 1944, has been known since at least 1685 (Willis). RLS is a fairly common sensorimotor disorder, yet is not widely recognized by the medical profession or healthcare providers. It is characterized in that it typically gives the individual who suffers from RLS an unpleasant sensation in the legs at rest, causing what is often described as an irresistible desire to move, which generally alleviates the discomfort. (Jones and Deodra, 1997) Also typically, individuals afflicted with RLS experience indescribable crawling sensations in their legs that often occur at night and that are only relieved by moving the legs. (Boucher, 1997) Accordingly, RLS and its related disorders are thought to be a common cause of severe insomnia. (Fox, 1986) RLS is idiopathic in most patients, and has been identified as a presenting feature of iron deficiency, and is also common in uremia, pregnancy, diabetes mellitus, rheumatoid arthritis, and polyneuropathy. (O'Keeffe, 1996) PLMD and PLMS, disorders related to RLS, are characterized by episodes of jerking of the limbs, often during periods in which the individual is asleep, and sometimes during periods in which the individual is awake. ... Therefore, there exists a need for an effective, alternative treatment and related treatment regime options for individuals who are afflicted with RLS and/or its related disorders. More particularly, there exists a need for treatments that do not induce the unwanted effects observed in modern therapeutics for Restless Leg Syndrome (RLS) and related disorders.

Web site: <http://appft1.uspto.gov/netahtml/PTO/search-bool.html>

- **Method for treating restless leg syndrome using pramipexole and clonidine**

Inventor(s): Brecht, Hans Michael ; (Ingelheim, DE)

Correspondence: Boehringer Ingelheim Corporation; 900 Ridgebury Road; P. O. Box 368; Ridgefield; CT; 06877; US

Patent Application Number: 20020010201

Date filed: October 4, 2001

Abstract: The invention relates to an active substance combination consisting of clonidine and pramipexole for treating Restless Leg Syndrome.

Excerpt(s): The invention relates to a method for treating Restless Leg Syndrome comprising the administration of pramipexole and clonidine, and a pharmaceutical composition suitable for the treatment of Restless Leg Syndrome comprising both pramipexole and clonidine. ... The present invention provides, as its first aspect, a novel method for the treatment of Restless Leg Syndrome which comprises administering both clonidine or a pharmaceutically acceptable salt thereof and pramipexole or a pharmaceutically acceptable salt thereof. As a second aspect, the invention provides a novel pharmaceutical composition suitable for the treatment of Restless Leg Syndrome which comprises both clonidine or a pharmaceutically acceptable salt thereof and pramipexole or a pharmaceutically acceptable salt thereof.

Web site: <http://appft1.uspto.gov/netahtml/PTO/search-bool.html>

- **Drug treatment for restless leg syndrome**

Inventor(s): Brecht, Hans Michael ; (Ingelheim, DE)

Correspondence: Boehringer Ingelheim Corporation; 900 Ridgebury Road; P. O. Box 368; Ridgefield; CT; 06877; US

Patent Application Number: 20010053777

Date filed: August 1, 2001

Abstract: A method for the treatment of Restless Leg Syndrome (RLS), which comprises administering an .alpha.2-agonist and a second agent selected from the group consisting of the dopamine agonists, opioids, benzodiazepines and the combination of L-DOPA plus a decarboxylase inhibitor.

Excerpt(s): The invention relates to a new combination of active substances for more effective treatment of Restless Leg Syndrome (RLS)

consisting of an .alpha.2-agonist and another neuropsychic drug which reduces the symptoms of RLS as a monotherapy. ... Restless Leg Syndrome is a neurological disorder which manifests itself chiefly as sensory disorders of the legs such as tingling, dragging, tearing, itching, burning, cramp or pain and in those affected triggers an irresistible compulsion to move. Frequently these disorders occur when the affected person is resting. Particularly at night, during sleep, these sensory disorders and the consequent compulsive movements lead to restlessness and sleep disorders. ... The present invention provides, as its first aspect, a novel method for the treatment of Restless Leg Syndrome which comprises administering both an .alpha.2-agonist and another neuropsychic drug which also leads to a reduction in RLS symptoms in monotherapy. As a second aspect, the invention provides a novel pharmaceutical composition suitable for the treatment of Restless Leg Syndrome which comprises both an .alpha.2-agonist and another neuropsychic drug which also leads to a reduction in RLS symptoms in monotherapy.

Web site: <http://appft1.uspto.gov/netahtml/PTO/search-bool.html>

Keeping Current

In order to stay informed about patents and patent applications dealing with restless leg syndrome, you can access the U.S. Patent Office archive via the Internet at no cost to you. This archive is available at the following Web address: <http://www.uspto.gov/main/patents.htm>. Under "Services," click on "Search Patents." You will see two broad options: (1) Patent Grants, and (2) Patent Applications. To see a list of granted patents, perform the following steps: Under "Patent Grants," click "Quick Search." Then, type "restless leg syndrome" (or synonyms) into the "Term 1" box. After clicking on the search button, scroll down to see the various patents which have been granted to date on restless leg syndrome. You can also use this procedure to view pending patent applications concerning restless leg syndrome. Simply go back to <http://www.uspto.gov/main/patents.htm>. Under "Services," click on "Search Patents." Select "Quick Search" under "Patent Applications." Then proceed with the steps listed above.

CHAPTER 5. BOOKS ON RESTLESS LEG SYNDROME

Overview

This chapter provides bibliographic book references relating to restless leg syndrome. You have many options to locate books on restless leg syndrome. The simplest method is to go to your local bookseller and inquire about titles that they have in stock or can special order for you. Some patients, however, feel uncomfortable approaching their local booksellers and prefer online sources (e.g. **www.amazon.com** and **www.bn.com**). In addition to online booksellers, excellent sources for book titles on restless leg syndrome include the Combined Health Information Database and the National Library of Medicine. Once you have found a title that interests you, visit your local public or medical library to see if it is available for loan.

Book Summaries: Online Booksellers

Commercial Internet-based booksellers, such as Amazon.com and Barnes & Noble.com, offer summaries which have been supplied by each title's publisher. Some summaries also include customer reviews. Your local bookseller may have access to in-house and commercial databases that index all published books (e.g. Books in Print®). The following have been recently listed with online booksellers as relating to restless leg syndrome (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- **Topping Restless Leg Syndrome** by Chet Cunningham, L. E. Mills;
ISBN:

<http://www.amazon.com/exec/obidos/ASIN/b>Publishe/icongroupin terna>

The National Library of Medicine Book Index

The National Library of Medicine at the National Institutes of Health has a massive database of books published on healthcare and biomedicine. Go to the following Internet site, <http://locatorplus.gov/>, and then select "Search LOCATORplus." Once you are in the search area, simply type "restless leg syndrome" (or synonyms) into the search box, and select "books only." From there, results can be sorted by publication date, author, or relevance. The following was recently catalogued by the National Library of Medicine:²¹

- **Adaptive response of slow and fast skeletal muscle in the monkey to spaceflight. Final report.** Author: S. Bodine-Fowler; Year: 1996; Washington, DC: NASA Headquarters, 1996
- **Akathisia and restless legs.** Author: Perminder Sachdev; Year: 1995; Cambridge; New York, NY, USA: Cambridge University Press, 1995; ISBN: 0521444268 (hardback)
<http://www.amazon.com/exec/obidos/ASIN/0521444268/icongroupin terna>
- **Anterior and the lateral compartment syndrome of the leg.** Author: Reneman, Robert S; Year: 1968; The Hague, Paris, Mouton [1968]
- **Atlas of surgical exposures of the upper and lower extremities.** Author: Raoul Tubiana, Alain C. Masquelet, Christopher J. McCullough; with contributions from Ian S. Fyfe, Leslie Klenerman, Emile Letournel; Year: 2000; London: M. Dunitz; Malden, MA: Distributed in the U.S. by Blackwell Science, 2000; ISBN: 1853178756
<http://www.amazon.com/exec/obidos/ASIN/1853178756/icongroupin terna>

²¹ In addition to LOCATORPlus, in collaboration with authors and publishers, the National Center for Biotechnology Information (NCBI) is adapting biomedical books for the Web. The books may be accessed in two ways: (1) by searching directly using any search term or phrase (in the same way as the bibliographic database PubMed), or (2) by following the links to PubMed abstracts. Each PubMed abstract has a "Books" button that displays a facsimile of the abstract in which some phrases are hypertext links. These phrases are also found in the books available at NCBI. Click on hyperlinked results in the list of books in which the phrase is found. Currently, the majority of the links are between the books and PubMed. In the future, more links will be created between the books and other types of information, such as gene and protein sequences and macromolecular structures. See <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books>.

- **Care of patients with chronic leg ulcer. A national clinical guideline. Scottish Intercollegiate Guidelines Network.** Author: Walsh, Mari C., 1951-; Year: 1998; Edinburgh, Scotland: SIGN, 1998; ISBN: 1899893261
- **Clinical assessment and treatment techniques for the lower extremity.** Author: Mari C. Walsh, May Nolan; Year: 1998; [Vancouver, B.C.: Kilkee Pub., 1998?]
- **Exercisers, continuous passive motion, lower limb: upper limb, hand.** Author: ECRI; Year: 2000; Plymouth Meeting, PA: ECRI, c2000
- **Leg muscle volume during 30-day 6-degree head-down bed rest with isotonic and isokinetic exercise training.** Author: J.E. Greenleaf ... [et al.]; Year: 1994; Washington, DC: NASA Headquarters, 1994
- **Metabolic complications of acute arterial occlusions and related conditions: (myonephropathic-metabolic syndrome).** Author: by Henry Haimovici; Year: 1988; Mount Kisco, N.Y.: Futura Pub. Co., 1988; ISBN: 0879933240
<http://www.amazon.com/exec/obidos/ASIN/0879933240/icongroupinterna>
- **Orthology: pathomechanics of lower-limb orthotic design.** Author: by Tom Lunsford; Year: 1998; Alexandria, VA: American Academy of Orthotists and Prosthetists, c1998
- **Phlebology: the guide.** Author: Albert-Adrien Ramelet, Michel Monti; with contributions from Henry Bounameaux, Georges Buchheim, Patrizio Capasso; preface by Georges Jantet; Year: 1999; Amsterdam; New York: Elsevier, 1999; ISBN: 2842991478
<http://www.amazon.com/exec/obidos/ASIN/2842991478/icongroupinterna>
- **Restless legs syndrome [electronic resource]: detection and management in primary care.** Author: National Center on Sleep Disorders Research, National Heart, Lung, and Blood Institute, National Institutes of Health; produced in collaboration with the Restless L; Year: 2000; [Bethesda, Md.]: The Center, [2000]
- **Restless legs, a clinical study of a hitherto overlooked disease in the legs characterized by peculiar paresthesia ("anxietas tibiaram"), pain and weakness and occurring in two main forms, asthenia crurum paraesthetica and asthenia crurum dolorosa. A shor.** Author: Ekbom, Karl-Axel, 1907-; Year: 1945; Stockholm [I. Haeggströms boktryckeri a. b.] 1945
- **Review of orthopaedic trauma.** Author: [edited by] Mark R. Brinker; Year: 2001; Philadelphia: Saunders, c2001; ISBN: 0721681913
<http://www.amazon.com/exec/obidos/ASIN/0721681913/icongroupinterna>

- **Sleep disorders sourcebook: basic consumer health information about sleep and its disorders including insomnia, sleepwalking, sleep apnea, restless leg syndrome, and narcolepsy; along with data about shiftwork and its effects, information on the societal.** Author: Sachdev, Perminder; Year: 1999; Detroit, MI: Omnigraphics, c1999; ISBN: 0780802349 (alk. paper) <http://www.amazon.com/exec/obidos/ASIN/0780802349/icongroupinterna>
- **Stiffness regulation during stretch-shortening cycle exercise.** Author: Tomoki Horita; Year: 2000; Jyväskylä: University of Jyväskylä, 2000; ISBN: 9513906930
- **Summary report of STS 51-D medical investigations by Payload Specialist 2.** Author: W.E. Thornton, T.P. Moore, N.M. Cintrón; Year: 1986; Houston, TX: NASA Johnson Space Center, 1986

Chapters on Restless Leg Syndrome

Frequently, restless leg syndrome will be discussed within a book, perhaps within a specific chapter. In order to find chapters that are specifically dealing with restless leg syndrome, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and restless leg syndrome using the "Detailed Search" option. Go directly to the following hyperlink: <http://chid.nih.gov/detail/detail.html>. To find book chapters, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Book Chapter." By making these selections and typing in "restless leg syndrome" (or synonyms) into the "For these words:" box, you will only receive results on chapters in books.

General Home References

In addition to references for restless leg syndrome, you may want a general home medical guide that spans all aspects of home healthcare. The following list is a recent sample of such guides (sorted alphabetically by title; hyperlinks provide rankings, information, and reviews at Amazon.com):

- **100 Questions About Sleep and Sleep Disorders** by Sudhansu Chokroverty, M.D.; Paperback - 110 pages, 1st edition (February 15, 2001), Blackwell Science Inc; ISBN: 0865425833; <http://www.amazon.com/exec/obidos/ASIN/0865425833/icongroupinterna>

- **The Bible Cure for Sleep Disorders** by Don Colbert; Paperback - 96 pages (March 2001), Siloam Press; ISBN: 0884197484;
<http://www.amazon.com/exec/obidos/ASIN/0884197484/icongroupinterna>
- **Sleep and Its Disorders : What You Should Know** by Robert G. Hooper, M.D., Melissa Mulera (Illustrator); Paperback - 176 pages (January 2001), Just Peachy Press; ISBN: 0970002645;
<http://www.amazon.com/exec/obidos/ASIN/0970002645/icongroupinterna>
- **Sleep Disorders Sourcebook: Basic Consumer Health Information About Sleep and Its Disorders, Including Insomnia, Sleepwalking, Sleep Apnea, Restless** by Jenifer Swanson (Editor); Library Binding - 600 pages (January 1999), Omnigraphics, Inc.; ISBN: 0780802349;
<http://www.amazon.com/exec/obidos/ASIN/0780802349/icongroupinterna>
- **Sleeping Well: The Sourcebook for Sleep and Sleep Disorders (The Facts for Life)** by Michael J. Thorpy, M.D., Jan Yager; Paperback - 342 pages (October 2001), Checkmark Books; ISBN: 0816040907;
<http://www.amazon.com/exec/obidos/ASIN/0816040907/icongroupinterna>

Vocabulary Builder

Arterial: Pertaining to an artery or to the arteries. [EU]

Asthenia: Lack or loss of strength and energy, weakness. [EU]

Biomechanics: The study of the application of mechanical laws and the action of forces to living structures. [NIH]

Ischemia: Deficiency of blood in a part, due to functional constriction or actual obstruction of a blood vessel. [EU]

Isotonic: A biological term denoting a solution in which body cells can be bathed without a net flow of water across the semipermeable cell membrane. Also, denoting a solution having the same tonicity as some other solution with which it is compared, such as physiologic salt solution and the blood serum. [EU]

Skeletal: Pertaining to the skeleton. [EU]

Ulcer: A local defect, or excavation, of the surface of an organ or tissue; which is produced by the sloughing of inflammatory necrotic tissue. [EU]

CHAPTER 7. PHYSICIAN GUIDELINES AND DATABASES

Overview

Doctors and medical researchers rely on a number of information sources to help patients with their conditions. Many will subscribe to journals or newsletters published by their professional associations or refer to specialized textbooks or clinical guides published for the medical profession. In this chapter, we focus on databases and Internet-based guidelines created or written for this professional audience.

NIH Guidelines

For the more common diseases, The National Institutes of Health publish guidelines that are frequently consulted by physicians. Publications are typically written by one or more of the various NIH Institutes. For physician guidelines, commonly referred to as “clinical” or “professional” guidelines, you can visit the following Institutes:

- Office of the Director (OD); guidelines consolidated across agencies available at **<http://www.nih.gov/health/consumer/conkey.htm>**
- National Institute of General Medical Sciences (NIGMS); fact sheets available at **<http://www.nigms.nih.gov/news/facts/>**
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines:
<http://www.nlm.nih.gov/medlineplus/healthtopics.html>
- National Heart, Lung, and Blood Institute (NHLBI); guidelines available at **<http://www.nhlbi.nih.gov/guidelines/index.htm>**

The NHLBI, in particular, suggests the following publications to physicians:

Sleep Disorders

- Restless Legs Syndrome: Detection and Management in Primary Care:
http://www.nhlbi.nih.gov/health/prof/sleep/rls_gde.htm
- Sleep Apnea: Is Your Patient at Risk?:
<http://www.nhlbi.nih.gov/health/prof/sleep/slpaprsk.htm>
- Insomnia: Assessment and Management in Primary Care:
http://www.nhlbi.nih.gov/health/prof/sleep/insom_pc.htm
- Problem Sleepiness in Your Patient:
http://www.nhlbi.nih.gov/health/prof/sleep/pslp_pat.htm
- Working Group Report on Problem Sleepiness:
http://www.nhlbi.nih.gov/health/prof/sleep/pslp_wg.htm
- National Center on Sleep Disorders Pamphlet:
<http://www.nhlbi.nih.gov/health/prof/sleep/sleep.txt>

Sleep in Youth

- Awake At the Wheel Materials:
<http://www.nhlbi.nih.gov/health/public/sleep/aaw/awake.htm>
- Educating Youth About Sleep and Drowsy Driving:
http://www.nhlbi.nih.gov/health/prof/sleep/dwydrv_y.htm
- Drowsy Driving and Automobile Crashes:
http://www.nhlbi.nih.gov/health/prof/sleep/drsy_drv.htm

Additional Resources

- National Center on Sleep Disorders Research Web Site:
<http://www.nhlbi.nih.gov/about/ncsdr/index.htm>
- Trans-NIH Sleep Research Coordinating Committee Annual Report:
<http://www.nhlbi.nih.gov/health/prof/sleep/sleep00.htm>
- Sleep Disorders Research Advisory Board (SDRAB):
<http://www.nhlbi.nih.gov/meetings/sdrab/index.htm>
- National Sleep Disorders Research Plan:
<http://www.nhlbi.nih.gov/health/prof/sleep/reschpln.htm>
- List of Publications: <http://www.nhlbi.nih.gov/health/pubs/index.htm>

- Information Center: <http://www.nhlbi.nih.gov/health/infoctr/index.htm>
- Sleep Information for Patients/Public:
<http://www.nhlbi.nih.gov/health/public/sleep/index.htm>

NIH Databases

In addition to the various Institutes of Health that publish professional guidelines, the NIH has designed a number of databases for professionals.²² Physician-oriented resources provide a wide variety of information related to the biomedical and health sciences, both past and present. The format of these resources varies. Searchable databases, bibliographic citations, full text articles (when available), archival collections, and images are all available. The following are referenced by the National Library of Medicine:²³

- **Bioethics:** Access to published literature on the ethical, legal and public policy issues surrounding healthcare and biomedical research. This information is provided in conjunction with the Kennedy Institute of Ethics located at Georgetown University, Washington, D.C.:
http://www.nlm.nih.gov/databases/databases_bioethics.html
- **HIV/AIDS Resources:** Describes various links and databases dedicated to HIV/ AIDS research:
<http://www.nlm.nih.gov/pubs/factsheets/aidsinfs.html>
- **NLM Online Exhibitions:** Describes “Exhibitions in the History of Medicine”: <http://www.nlm.nih.gov/exhibition/exhibition.html>. Additional resources for historical scholarship in medicine:
<http://www.nlm.nih.gov/hmd/hmd.html>
- **Biotechnology Information:** Access to public databases. The National Center for Biotechnology Information conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information for the better understanding of molecular processes affecting human health and disease: <http://www.ncbi.nlm.nih.gov/>
- **Population Information:** The National Library of Medicine provides access to worldwide coverage of population, family planning, and related health issues, including family planning technology and programs,

²² Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINEplus (<http://medlineplus.gov/> or <http://www.nlm.nih.gov/medlineplus/databases.html>).

²³ See <http://www.nlm.nih.gov/databases/databases.html>.

fertility, and population law and policy:

http://www.nlm.nih.gov/databases/databases_population.html

- **Cancer Information:** Access to cancer-oriented databases:
http://www.nlm.nih.gov/databases/databases_cancer.html
- **Profiles in Science:** Offering the archival collections of prominent twentieth-century biomedical scientists to the public through modern digital technology: <http://www.profiles.nlm.nih.gov/>
- **Chemical Information:** Provides links to various chemical databases and references: <http://sis.nlm.nih.gov/Chem/ChemMain.html>
- **Clinical Alerts:** Reports the release of findings from the NIH-funded clinical trials where such release could significantly affect morbidity and mortality: http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html
- **Space Life Sciences:** Provides links and information to space-based research (including NASA):
http://www.nlm.nih.gov/databases/databases_space.html
- **MEDLINE:** Bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the healthcare system, and the pre-clinical sciences:
http://www.nlm.nih.gov/databases/databases_medline.html
- **Toxicology and Environmental Health Information (TOXNET):** Databases covering toxicology and environmental health:
<http://sis.nlm.nih.gov/Tox/ToxMain.html>
- **Visible Human Interface:** Anatomically detailed, three-dimensional representations of normal male and female human bodies:
http://www.nlm.nih.gov/research/visible/visible_human.html

While all of the above references may be of interest to physicians who study and treat restless leg syndrome, the following are particularly noteworthy.

The NLM Gateway²⁴

The NLM (National Library of Medicine) Gateway is a Web-based system that lets users search simultaneously in multiple retrieval systems at the U.S. National Library of Medicine (NLM). It allows users of NLM services to initiate searches from one Web interface, providing “one-stop searching” for

²⁴ Adapted from NLM: <http://gateway.nlm.nih.gov/gw/Cmd?Overview.x>.

many of NLM's information resources or databases.²⁵ One target audience for the Gateway is the Internet user who is new to NLM's online resources and does not know what information is available or how best to search for it. This audience may include physicians and other healthcare providers, researchers, librarians, students, and, increasingly, patients, their families, and the public.²⁶ To use the NLM Gateway, simply go to the search site at <http://gateway.nlm.nih.gov/gw/Cmd>. Type "restless leg syndrome" (or synonyms) into the search box and click "Search." The results will be presented in a tabular form, indicating the number of references in each database category.

Results Summary

Category	Items Found
Journal Articles	257
Books / Periodicals / Audio Visual	1
Consumer Health	11
Meeting Abstracts	0
Other Collections	0
Total	269

HSTAT²⁷

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.²⁸ HSTAT's audience includes healthcare providers, health service researchers, policy makers, insurance companies, consumers, and the information professionals who serve these groups. HSTAT provides access to a wide variety of publications,

²⁵ The NLM Gateway is currently being developed by the Lister Hill National Center for Biomedical Communications (LHNCBC) at the National Library of Medicine (NLM) of the National Institutes of Health (NIH).

²⁶ Other users may find the Gateway useful for an overall search of NLM's information resources. Some searchers may locate what they need immediately, while others will utilize the Gateway as an adjunct tool to other NLM search services such as PubMed® and MEDLINEplus®. The Gateway connects users with multiple NLM retrieval systems while also providing a search interface for its own collections. These collections include various types of information that do not logically belong in PubMed, LOCATORplus, or other established NLM retrieval systems (e.g., meeting announcements and pre-1966 journal citations). The Gateway will provide access to the information found in an increasing number of NLM retrieval systems in several phases.

²⁷ Adapted from HSTAT: <http://www.nlm.nih.gov/pubs/factsheets/hstat.html>.

²⁸ The HSTAT URL is <http://hstat.nlm.nih.gov/>.

including clinical practice guidelines, quick-reference guides for clinicians, consumer health brochures, evidence reports and technology assessments from the Agency for Healthcare Research and Quality (AHRQ), as well as AHRQ's Put Prevention Into Practice.²⁹ Simply search by "restless leg syndrome" (or synonyms) at the following Web site: <http://text.nlm.nih.gov>.

Coffee Break: Tutorials for Biologists³⁰

Some patients may wish to have access to a general healthcare site that takes a scientific view of the news and covers recent breakthroughs in biology that may one day assist physicians in developing treatments. To this end, we recommend "Coffee Break," a collection of short reports on recent biological discoveries. Each report incorporates interactive tutorials that demonstrate how bioinformatics tools are used as a part of the research process. Currently, all Coffee Breaks are written by NCBI staff.³¹ Each report is about 400 words and is usually based on a discovery reported in one or more articles from recently published, peer-reviewed literature.³² This site has new articles every few weeks, so it can be considered an online magazine of sorts, and intended for general background information. You can access the Coffee Break Web site at <http://www.ncbi.nlm.nih.gov/Coffeebreak/>.

²⁹ Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's *Guide to Clinical Preventive Services*; the independent, nonfederal Task Force on Community Services *Guide to Community Preventive Services*; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.

³⁰ Adapted from <http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html>.

³¹ The figure that accompanies each article is frequently supplied by an expert external to NCBI, in which case the source of the figure is cited. The result is an interactive tutorial that tells a biological story.

³² After a brief introduction that sets the work described into a broader context, the report focuses on how a molecular understanding can provide explanations of observed biology and lead to therapies for diseases. Each vignette is accompanied by a figure and hypertext links that lead to a series of pages that interactively show how NCBI tools and resources are used in the research process.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are a few examples that may interest you:

- **CliniWeb International:** Index and table of contents to selected clinical information on the Internet; see <http://www.ohsu.edu/clinweb/>.
- **Image Engine:** Multimedia electronic medical record system that integrates a wide range of digitized clinical images with textual data stored in the University of Pittsburgh Medical Center's MARS electronic medical record system; see the following Web site: <http://www.cml.upmc.edu/cml/imageengine/imageEngine.html>.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see <http://www.mwsearch.com/>.
- **MedWeaver:** Prototype system that allows users to search differential diagnoses for any list of signs and symptoms, to search medical literature, and to explore relevant Web sites; see <http://www.med.virginia.edu/~wmd4n/medweaver.html>.
- **Metaphrase:** Middleware component intended for use by both caregivers and medical records personnel. It converts the informal language generally used by caregivers into terms from formal, controlled vocabularies; see the following Web site: <http://www.lexical.com/Metaphrase.html>.

Specialized References

The following books are specialized references written for professionals interested in restless leg syndrome (sorted alphabetically by title, hyperlinks provide rankings, information, and reviews at Amazon.com):

- **Clinical Companion to Sleep Disorders Medicine Second Edition** by Sudhansu Chokroverty; Paperback - 232 pages, 2nd edition (April 2000), Butterworth-Heinemann Medical; ISBN: 0750696877; <http://www.amazon.com/exec/obidos/ASIN/0750696877/icongroupinterna>
- **Concise Guide to Evaluation and Management of Sleep Disorders (Concise Guides)** by Martin Reite, et al; Paperback 3rd edition (April 2002), American Psychiatric Press; ISBN: 1585620459; <http://www.amazon.com/exec/obidos/ASIN/1585620459/icongroupinterna>

- **The Encyclopedia of Sleep and Sleep Disorders, Second Edition** by Michael J. Thorpy, M.D, Jan Yager; Library Binding - 352 pages, 2nd Updated edition (May 2001), Facts on File, Inc.; ISBN: 0816040893;
<http://www.amazon.com/exec/obidos/ASIN/0816040893/icongroupinterna>
- **Sleep Disorders (Encyclopedia of Psychological Disorders)** by Linda N. Bayer, et al; Library Binding (October 2000), Chelsea House Pub (Library); ISBN: 0791053148;
<http://www.amazon.com/exec/obidos/ASIN/0791053148/icongroupinterna>
- **Sleep Disorders: Diagnosis and Treatment** by J. Steven Poceta (Editor), Merrill Morris Mitler (Editor); Hardcover - 232 pages, 1st edition (June 15, 1998), Humana Press; ISBN: 0896035271;
<http://www.amazon.com/exec/obidos/ASIN/0896035271/icongroupinterna>
- **Sleep Disorders and Neurological Disease** by Antonio Culebras (Editor); Hardcover - 422 pages, 1st edition (October 15, 1999), Marcel Dekker; ISBN: 0824776054;
<http://www.amazon.com/exec/obidos/ASIN/0824776054/icongroupinterna>
- **Sleep Disorders Handbook** by Peretz Lavie, M.D., et al; Paperback (March 2002), Boston Medical Pub Inc; ISBN: 1841840556;
<http://www.amazon.com/exec/obidos/ASIN/1841840556/icongroupinterna>
- **Sleep Disorders Medicine: Basic Science, Technical Considerations, and Clinical Aspects** by Sudhansu Chokroverty (Editor), Robert B. Daroff (Introduction); Hardcover - 781 pages, 2nd edition (January 15, 1999), Butterworth-Heinemann Medical; ISBN: 075069954X;
<http://www.amazon.com/exec/obidos/ASIN/075069954X/icongroupinterna>

PART III. APPENDICES

ABOUT PART III

Part III is a collection of appendices on general medical topics which may be of interest to patients with restless leg syndrome and related conditions.

APPENDIX A. RESEARCHING YOUR MEDICATIONS

Overview

There are a number of sources available on new or existing medications which could be prescribed to patients with restless leg syndrome. While a number of hard copy or CD-Rom resources are available to patients and physicians for research purposes, a more flexible method is to use Internet-based databases. In this chapter, we will begin with a general overview of medications. We will then proceed to outline official recommendations on how you should view your medications. You may also want to research medications that you are currently taking for other conditions as they may interact with medications for restless leg syndrome. Research can give you information on the side effects, interactions, and limitations of prescription drugs used in the treatment of restless leg syndrome. Broadly speaking, there are two sources of information on approved medications: public sources and private sources. We will emphasize free-to-use public sources.

Your Medications: The Basics³³

The Agency for Health Care Research and Quality has published extremely useful guidelines on how you can best participate in the medication aspects of restless leg syndrome. Taking medicines is not always as simple as swallowing a pill. It can involve many steps and decisions each day. The AHCQRQ recommends that patients with restless leg syndrome take part in treatment decisions. Do not be afraid to ask questions and talk about your concerns. By taking a moment to ask questions early, you may avoid problems later. Here are some points to cover each time a new medicine is prescribed:

- Ask about all parts of your treatment, including diet changes, exercise, and medicines.
- Ask about the risks and benefits of each medicine or other treatment you might receive.
- Ask how often you or your doctor will check for side effects from a given medication.

Do not hesitate to ask what is important to you about your medicines. You may want a medicine with the fewest side effects, or the fewest doses to take each day. You may care most about cost, or how the medicine might affect how you live or work. Or, you may want the medicine your doctor believes will work the best. Telling your doctor will help him or her select the best treatment for you.

Do not be afraid to “bother” your doctor with your concerns and questions about medications for restless leg syndrome. You can also talk to a nurse or a pharmacist. They can help you better understand your treatment plan. Feel free to bring a friend or family member with you when you visit your doctor. Talking over your options with someone you trust can help you make better choices, especially if you are not feeling well. Specifically, ask your doctor the following:

- The name of the medicine and what it is supposed to do.
- How and when to take the medicine, how much to take, and for how long.
- What food, drinks, other medicines, or activities you should avoid while taking the medicine.
- What side effects the medicine may have, and what to do if they occur.

³³ This section is adapted from AHCQRQ: <http://www.ahcpr.gov/consumer/ncpiebro.htm>.

- If you can get a refill, and how often.
- About any terms or directions you do not understand.
- What to do if you miss a dose.
- If there is written information you can take home (most pharmacies have information sheets on your prescription medicines; some even offer large-print or Spanish versions).

Do not forget to tell your doctor about all the medicines you are currently taking (not just those for restless leg syndrome). This includes prescription medicines and the medicines that you buy over the counter. Then your doctor can avoid giving you a new medicine that may not work well with the medications you take now. When talking to your doctor, you may wish to prepare a list of medicines you currently take, the reason you take them, and how you take them. Be sure to include the following information for each:

- Name of medicine
- Reason taken
- Dosage
- Time(s) of day

Also include any over-the-counter medicines, such as:

- Laxatives
- Diet pills
- Vitamins
- Cold medicine
- Aspirin or other pain, headache, or fever medicine
- Cough medicine
- Allergy relief medicine
- Antacids
- Sleeping pills
- Others (include names)

Learning More about Your Medications

Because of historical investments by various organizations and the emergence of the Internet, it has become rather simple to learn about the medications your doctor has recommended for restless leg syndrome. One such source is the United States Pharmacopeia. In 1820, eleven physicians met in Washington, D.C. to establish the first compendium of standard drugs for the United States. They called this compendium the “U.S. Pharmacopeia (USP).” Today, the USP is a non-profit organization consisting of 800 volunteer scientists, eleven elected officials, and 400 representatives of state associations and colleges of medicine and pharmacy. The USP is located in Rockville, Maryland, and its home page is located at **www.usp.org**. The USP currently provides standards for over 3,700 medications. The resulting USP DI® Advice for the Patient® can be accessed through the National Library of Medicine of the National Institutes of Health. The database is partially derived from lists of federally approved medications in the Food and Drug Administration’s (FDA) Drug Approvals database.³⁴

While the FDA database is rather large and difficult to navigate, the Pharmacopeia is both user-friendly and free to use. It covers more than 9,000 prescription and over-the-counter medications. To access this database, simply type the following hyperlink into your Web browser: **<http://www.nlm.nih.gov/medlineplus/druginformation.html>**. To view examples of a given medication (brand names, category, description, preparation, proper use, precautions, side effects, etc.), simply follow the hyperlinks indicated within the United States Pharmacopoeia. It is important to read the disclaimer by the United States Pharmacopoeia (**<http://www.nlm.nih.gov/medlineplus/drugdisclaimer.html>**) before using the information provided.

Commercial Databases

In addition to the medications listed in the USP above, a number of commercial sites are available by subscription to physicians and their institutions. You may be able to access these sources from your local medical library or your doctor’s office.

³⁴ Though cumbersome, the FDA database can be freely browsed at the following site: **www.fda.gov/cder/da/da.htm**.

Reuters Health Drug Database

The Reuters Health Drug Database can be searched by keyword at the hyperlink: <http://www.reutershealth.com/frame2/drug.html>. The following medications are listed in the Reuters' database as associated with restless leg syndrome (including those with contraindications):³⁵

- **Levodopa**

<http://www.reutershealth.com/atoz/html/Levodopa.htm>

Mosby's GenRx

Mosby's GenRx database (also available on CD-Rom and book format) covers 45,000 drug products including generics and international brands. It provides prescribing information, drug interactions, and patient information. Information in Mosby's GenRx database can be obtained at the following hyperlink: <http://www.genrx.com/Mosby/PhyGenRx/group.html>.

Physicians Desk Reference

The Physicians Desk Reference database (also available in CD-Rom and book format) is a full-text drug database. The database is searchable by brand name, generic name or by indication. It features multiple drug interactions reports. Information can be obtained at the following hyperlink: http://physician.pdr.net/physician/templates/en/acl/psuser_t.htm.

Other Web Sites

A number of additional Web sites discuss drug information. As an example, you may like to look at **www.drugs.com** which reproduces the information in the Pharmacopeia as well as commercial information. You may also want to consider the Web site of the Medical Letter, Inc. which allows users to download articles on various drugs and therapeutics for a nominal fee: <http://www.medletter.com/>.

³⁵ Adapted from *A to Z Drug Facts* by Facts and Comparisons.

Contraindications and Interactions (Hidden Dangers)

Some of the medications mentioned in the previous discussions can be problematic for patients with restless leg syndrome--not because they are used in the treatment process, but because of contraindications, or side effects. Medications with contraindications are those that could react with drugs used to treat restless leg syndrome or potentially create deleterious side effects in patients with restless leg syndrome. You should ask your physician about any contraindications, especially as these might apply to other medications that you may be taking for common ailments.

Drug-drug interactions occur when two or more drugs react with each other. This drug-drug interaction may cause you to experience an unexpected side effect. Drug interactions may make your medications less effective, cause unexpected side effects, or increase the action of a particular drug. Some drug interactions can even be harmful to you.

Be sure to read the label every time you use a nonprescription or prescription drug, and take the time to learn about drug interactions. These precautions may be critical to your health. You can reduce the risk of potentially harmful drug interactions and side effects with a little bit of knowledge and common sense.

Drug labels contain important information about ingredients, uses, warnings, and directions which you should take the time to read and understand. Labels also include warnings about possible drug interactions. Further, drug labels may change as new information becomes available. This is why it's especially important to read the label every time you use a medication. When your doctor prescribes a new drug, discuss all over-the-counter and prescription medications, dietary supplements, vitamins, botanicals, minerals and herbals you take as well as the foods you eat. Ask your pharmacist for the package insert for each prescription drug you take. The package insert provides more information about potential drug interactions.

A Final Warning

At some point, you may hear of alternative medications from friends, relatives, or in the news media. Advertisements may suggest that certain alternative drugs can produce positive results for patients with restless leg syndrome. Exercise caution--some of these drugs may have fraudulent

claims, and others may actually hurt you. The Food and Drug Administration (FDA) is the official U.S. agency charged with discovering which medications are likely to improve the health of patients with restless leg syndrome. The FDA warns patients to watch out for³⁶:

- Secret formulas (real scientists share what they know)
- Amazing breakthroughs or miracle cures (real breakthroughs don't happen very often; when they do, real scientists do not call them amazing or miracles)
- Quick, painless, or guaranteed cures
- If it sounds too good to be true, it probably isn't true.

If you have any questions about any kind of medical treatment, the FDA may have an office near you. Look for their number in the blue pages of the phone book. You can also contact the FDA through its toll-free number, 1-888-INFO-FDA (1-888-463-6332), or on the World Wide Web at www.fda.gov.

General References

In addition to the resources provided earlier in this chapter, the following general references describe medications (sorted alphabetically by title; hyperlinks provide rankings, information and reviews at Amazon.com):

- **Complete Guide to Prescription and Nonprescription Drugs 2001** (**Complete Guide to Prescription and Nonprescription Drugs, 2001**) by H. Winter Griffith, Paperback 16th edition (2001), Medical Surveillance; ISBN: 0942447417;
<http://www.amazon.com/exec/obidos/ASIN/039952634X/icongroupinterna>
- **The Essential Guide to Prescription Drugs, 2001** by James J. Rybacki, James W. Long; Paperback - 1274 pages (2001), Harper Resource; ISBN: 0060958162;
<http://www.amazon.com/exec/obidos/ASIN/0060958162/icongroupinterna>
- **Handbook of Commonly Prescribed Drugs** by G. John Digregorio, Edward J. Barbieri; Paperback 16th edition (2001), Medical Surveillance; ISBN: 0942447417;
<http://www.amazon.com/exec/obidos/ASIN/0942447417/icongroupinterna>
- **Johns Hopkins Complete Home Encyclopedia of Drugs 2nd ed.** by Simeon Margolis (Ed.), Johns Hopkins; Hardcover - 835 pages (2000),

³⁶ This section has been adapted from <http://www.fda.gov/opacom/lowlit/medfraud.html>.

Rebus; ISBN: 0929661583;

<http://www.amazon.com/exec/obidos/ASIN/0929661583/icongroupinterna>

- **Medical Pocket Reference: Drugs 2002** by Springhouse Paperback 1st edition (2001), Lippincott Williams & Wilkins Publishers; ISBN: 1582550964;
<http://www.amazon.com/exec/obidos/ASIN/1582550964/icongroupinterna>
- **PDR** by Medical Economics Staff, Medical Economics Staff Hardcover - 3506 pages 55th edition (2000), Medical Economics Company; ISBN: 1563633752;
<http://www.amazon.com/exec/obidos/ASIN/1563633752/icongroupinterna>
- **Pharmacy Simplified: A Glossary of Terms** by James Grogan; Paperback - 432 pages, 1st edition (2001), Delmar Publishers; ISBN: 0766828581;
<http://www.amazon.com/exec/obidos/ASIN/0766828581/icongroupinterna>
- **Physician Federal Desk Reference** by Christine B. Fraizer; Paperback 2nd edition (2001), Medicode Inc; ISBN: 1563373971;
<http://www.amazon.com/exec/obidos/ASIN/1563373971/icongroupinterna>
- **Physician's Desk Reference Supplements** Paperback - 300 pages, 53 edition (1999), ISBN: 1563632950;
<http://www.amazon.com/exec/obidos/ASIN/1563632950/icongroupinterna>

Vocabulary Builder

The following vocabulary builder gives definitions of words used in this chapter that have not been defined in previous chapters:

Levodopa: The naturally occurring form of dopa and the immediate precursor of dopamine. Unlike dopamine itself, it can be taken orally and crosses the blood-brain barrier. It is rapidly taken up by dopaminergic neurons and converted to dopamine. It is used for the treatment of parkinsonism and is usually given with agents that inhibit its conversion to dopamine outside of the central nervous system. [NIH]

APPENDIX B. RESEARCHING ALTERNATIVE MEDICINE

Overview

Complementary and alternative medicine (CAM) is one of the most contentious aspects of modern medical practice. You may have heard of these treatments on the radio or on television. Maybe you have seen articles written about these treatments in magazines, newspapers, or books. Perhaps your friends or doctor have mentioned alternatives.

In this chapter, we will begin by giving you a broad perspective on complementary and alternative therapies. Next, we will introduce you to official information sources on CAM relating to restless leg syndrome. Finally, at the conclusion of this chapter, we will provide a list of readings on restless leg syndrome from various authors. We will begin, however, with the National Center for Complementary and Alternative Medicine's (NCCAM) overview of complementary and alternative medicine.

What Is CAM?³⁷

Complementary and alternative medicine (CAM) covers a broad range of healing philosophies, approaches, and therapies. Generally, it is defined as those treatments and healthcare practices which are not taught in medical schools, used in hospitals, or reimbursed by medical insurance companies. Many CAM therapies are termed "holistic," which generally means that the healthcare practitioner considers the whole person, including physical, mental, emotional, and spiritual health. Some of these therapies are also known as "preventive," which means that the practitioner educates and

³⁷ Adapted from the NCCAM: <http://nccam.nih.gov/nccam/fcp/faq/index.html#what-is>.

treats the person to prevent health problems from arising, rather than treating symptoms after problems have occurred.

People use CAM treatments and therapies in a variety of ways. Therapies are used alone (often referred to as alternative), in combination with other alternative therapies, or in addition to conventional treatment (sometimes referred to as complementary). Complementary and alternative medicine, or “integrative medicine,” includes a broad range of healing philosophies, approaches, and therapies. Some approaches are consistent with physiological principles of Western medicine, while others constitute healing systems with non-Western origins. While some therapies are far outside the realm of accepted Western medical theory and practice, others are becoming established in mainstream medicine.

Complementary and alternative therapies are used in an effort to prevent illness, reduce stress, prevent or reduce side effects and symptoms, or control or cure disease. Some commonly used methods of complementary or alternative therapy include mind/body control interventions such as visualization and relaxation, manual healing including acupressure and massage, homeopathy, vitamins or herbal products, and acupuncture.

What Are the Domains of Alternative Medicine?³⁸

The list of CAM practices changes continually. The reason being is that these new practices and therapies are often proved to be safe and effective, and therefore become generally accepted as “mainstream” healthcare practices. Today, CAM practices may be grouped within five major domains: (1) alternative medical systems, (2) mind-body interventions, (3) biologically-based treatments, (4) manipulative and body-based methods, and (5) energy therapies. The individual systems and treatments comprising these categories are too numerous to list in this sourcebook. Thus, only limited examples are provided within each.

Alternative Medical Systems

Alternative medical systems involve complete systems of theory and practice that have evolved independent of, and often prior to, conventional biomedical approaches. Many are traditional systems of medicine that are

³⁸ Adapted from the NCCAM: <http://nccam.nih.gov/nccam/fcp/classify/index.html>.

practiced by individual cultures throughout the world, including a number of venerable Asian approaches.

Traditional oriental medicine emphasizes the balance or disturbances of qi (pronounced chi) or vital energy in health and disease, respectively. Traditional oriental medicine consists of a group of techniques and methods including acupuncture, herbal medicine, oriental massage, and qi gong (a form of energy therapy). Acupuncture involves stimulating specific anatomic points in the body for therapeutic purposes, usually by puncturing the skin with a thin needle.

Ayurveda is India's traditional system of medicine. Ayurvedic medicine (meaning "science of life") is a comprehensive system of medicine that places equal emphasis on body, mind, and spirit. Ayurveda strives to restore the innate harmony of the individual. Some of the primary Ayurvedic treatments include diet, exercise, meditation, herbs, massage, exposure to sunlight, and controlled breathing.

Other traditional healing systems have been developed by the world's indigenous populations. These populations include Native American, Aboriginal, African, Middle Eastern, Tibetan, and Central and South American cultures. Homeopathy and naturopathy are also examples of complete alternative medicine systems.

Homeopathic medicine is an unconventional Western system that is based on the principle that "like cures like," i.e., that the same substance that in large doses produces the symptoms of an illness, in very minute doses cures it. Homeopathic health practitioners believe that the more dilute the remedy, the greater its potency. Therefore, they use small doses of specially prepared plant extracts and minerals to stimulate the body's defense mechanisms and healing processes in order to treat illness.

Naturopathic medicine is based on the theory that disease is a manifestation of alterations in the processes by which the body naturally heals itself and emphasizes health restoration rather than disease treatment. Naturopathic physicians employ an array of healing practices, including the following: diet and clinical nutrition, homeopathy, acupuncture, herbal medicine, hydrotherapy (the use of water in a range of temperatures and methods of applications), spinal and soft-tissue manipulation, physical therapies (such as those involving electrical currents, ultrasound, and light), therapeutic counseling, and pharmacology.

Mind-Body Interventions

Mind-body interventions employ a variety of techniques designed to facilitate the mind's capacity to affect bodily function and symptoms. Only a select group of mind-body interventions having well-documented theoretical foundations are considered CAM. For example, patient education and cognitive-behavioral approaches are now considered "mainstream." On the other hand, complementary and alternative medicine includes meditation, certain uses of hypnosis, dance, music, and art therapy, as well as prayer and mental healing.

Biological-Based Therapies

This category of CAM includes natural and biological-based practices, interventions, and products, many of which overlap with conventional medicine's use of dietary supplements. This category includes herbal, special dietary, orthomolecular, and individual biological therapies.

Herbal therapy employs an individual herb or a mixture of herbs for healing purposes. An herb is a plant or plant part that produces and contains chemical substances that act upon the body. Special diet therapies, such as those proposed by Drs. Atkins, Ornish, Pritikin, and Weil, are believed to prevent and/or control illness as well as promote health. Orthomolecular therapies aim to treat disease with varying concentrations of chemicals such as magnesium, melatonin, and mega-doses of vitamins. Biological therapies include, for example, the use of laetrile and shark cartilage to treat cancer and the use of bee pollen to treat autoimmune and inflammatory diseases.

Manipulative and Body-Based Methods

This category includes methods that are based on manipulation and/or movement of the body. For example, chiropractors focus on the relationship between structure and function, primarily pertaining to the spine, and how that relationship affects the preservation and restoration of health. Chiropractors use manipulative therapy as an integral treatment tool.

In contrast, osteopaths place particular emphasis on the musculoskeletal system and practice osteopathic manipulation. Osteopaths believe that all of the body's systems work together and that disturbances in one system may have an impact upon function elsewhere in the body. Massage therapists manipulate the soft tissues of the body to normalize those tissues.

Energy Therapies

Energy therapies focus on energy fields originating within the body (biofields) or those from other sources (electromagnetic fields). Biofield therapies are intended to affect energy fields (the existence of which is not yet experimentally proven) that surround and penetrate the human body. Some forms of energy therapy manipulate biofields by applying pressure and/or manipulating the body by placing the hands in or through these fields. Examples include Qi gong, Reiki and Therapeutic Touch.

Qi gong is a component of traditional oriental medicine that combines movement, meditation, and regulation of breathing to enhance the flow of vital energy (qi) in the body, improve blood circulation, and enhance immune function. Reiki, the Japanese word representing Universal Life Energy, is based on the belief that, by channeling spiritual energy through the practitioner, the spirit is healed and, in turn, heals the physical body. Therapeutic Touch is derived from the ancient technique of “laying-on of hands.” It is based on the premises that the therapist’s healing force affects the patient’s recovery and that healing is promoted when the body’s energies are in balance. By passing their hands over the patient, these healers identify energy imbalances.

Bioelectromagnetic-based therapies involve the unconventional use of electromagnetic fields to treat illnesses or manage pain. These therapies are often used to treat asthma, cancer, and migraine headaches. Types of electromagnetic fields which are manipulated in these therapies include pulsed fields, magnetic fields, and alternating current or direct current fields.

Can Alternatives Affect My Treatment?

A critical issue in pursuing complementary alternatives mentioned thus far is the risk that these might have undesirable interactions with your medical treatment. It becomes all the more important to speak with your doctor who can offer advice on the use of alternatives. Official sources confirm this view. Though written for women, we find that the National Women’s Health Information Center’s advice on pursuing alternative medicine is appropriate for patients of both genders and all ages.³⁹

³⁹ Adapted from <http://www.4woman.gov/faq/alternative.htm>.

Is It Okay to Want Both Traditional and Alternative Medicine?

Should you wish to explore non-traditional types of treatment, be sure to discuss all issues concerning treatments and therapies with your healthcare provider, whether a physician or practitioner of complementary and alternative medicine. Competent healthcare management requires knowledge of both conventional and alternative therapies you are taking for the practitioner to have a complete picture of your treatment plan.

The decision to use complementary and alternative treatments is an important one. Consider before selecting an alternative therapy, the safety and effectiveness of the therapy or treatment, the expertise and qualifications of the healthcare practitioner, and the quality of delivery. These topics should be considered when selecting any practitioner or therapy.

Finding CAM References on Restless Leg Syndrome

Having read the previous discussion, you may be wondering which complementary or alternative treatments might be appropriate for restless leg syndrome. For the remainder of this chapter, we will direct you to a number of official sources which can assist you in researching studies and publications. Some of these articles are rather technical, so some patience may be required.

National Center for Complementary and Alternative Medicine

The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (<http://nccam.nih.gov>) has created a link to the National Library of Medicine's databases to allow patients to search for articles that specifically relate to restless leg syndrome and complementary medicine. To search the database, go to the following Web site: www.nlm.nih.gov/nccam/camonpubmed.html. Select "CAM on PubMed." Enter "restless leg syndrome" (or synonyms) into the search box. Click "Go." The following references provide information on particular aspects of complementary and alternative medicine (CAM) that are related to restless leg syndrome:

- **Acupuncture treatment of restless leg syndrome.**
Author(s): Hu J.

Source: J Tradit Chin Med. 2001 December; 21(4): 312-6. No Abstract Available.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12014138&dopt=Abstract

- **Restless legs syndrome and periodic movements of sleep.**

Author(s): Krueger BR.

Source: Mayo Clin Proc. 1990 July; 65(7): 999-1006. Review.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2198400&dopt=Abstract

- **Sleep disorders.**

Author(s): Silber MH.

Source: Neurologic Clinics. 2001 February; 19(1): 173-86. Review.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11471763&dopt=Abstract

- **What every nurse needs to know about nocturnal sleep-related eating disorder.**

Author(s): Montgomery L, Haynes LC.

Source: J Psychosoc Nurs Ment Health Serv. 2001 August; 39(8): 14-20.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11503427&dopt=Abstract

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering CAM and related topics. The following is a representative sample:

- Alternative Medicine Foundation, Inc.: <http://www.herbmed.org/>
- AOL: <http://search.aol.com/cat.adp?id=169&layer=&from=subcats>
- Chinese Medicine: <http://www.newcenturynutrition.com/>
- drkoop.com[®]:
<http://www.drkoop.com/InteractiveMedicine/IndexC.html>
- Family Village: http://www.familyvillage.wisc.edu/med_altn.htm
- Google: <http://directory.google.com/Top/Health/Alternative/>
- Healthnotes: <http://www.thedacare.org/healthnotes/>
- Open Directory Project: <http://dmoz.org/Health/Alternative/>

- TPN.com: <http://www.tnp.com/>
- Yahoo.com: http://dir.yahoo.com/Health/Alternative_Medicine/
- WebMD® Health: http://my.webmd.com/drugs_and_herbs
- WellNet: <http://www.wellnet.ca/herbsa-c.htm>
- WholeHealthMD.com:
<http://www.wholehealthmd.com/reflib/0,1529,,00.html>

The following is a specific Web list relating to restless leg syndrome; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **Herbs and Supplements**

- 5-Hydroxytryptophan**

- Source: Integrative Medicine Communications; www.onemedicine.com

- Hyperlink:

- <http://www.drkoop.com/interactivemedicine/ConsConditions/Insomniacc.html>

- Barbiturates**

- Source: Integrative Medicine Communications; www.onemedicine.com

- Hyperlink:

- <http://www.drkoop.com/interactivemedicine/ConsConditions/Insomniacc.html>

- Benzodiazepines**

- Source: Integrative Medicine Communications; www.onemedicine.com

- Hyperlink:

- <http://www.drkoop.com/interactivemedicine/ConsConditions/Insomniacc.html>

- Beta-Blockers**

- Source: Integrative Medicine Communications; www.onemedicine.com

- Hyperlink:

- <http://www.drkoop.com/interactivemedicine/ConsConditions/Insomniacc.html>

- Caffeine**

- Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Chamomile

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Clonazepam

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Diazepam

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Diazepam

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Hops

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Kava

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Kava Kava

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Kola

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Lavender

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Lemon Balm

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Melatonin

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Mentha

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Pramipexole

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Selective Serotonin Reuptake Inhibitors

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Triazolam

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Valerian

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

- **Related Conditions**

Fibromyalgia

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Fibromyalgia.html>

Insomnia

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Restless Legs Syndrome

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Sleeplessness

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

General References

A good place to find general background information on CAM is the National Library of Medicine. It has prepared within the MEDLINEplus system an information topic page dedicated to complementary and alternative medicine. To access this page, go to the MEDLINEplus site at: www.nlm.nih.gov/medlineplus/alternativemedicine.html. This Web site provides a general overview of various topics and can lead to a number of general sources. The following additional references describe, in broad terms, alternative and complementary medicine (sorted alphabetically by title; hyperlinks provide rankings, information, and reviews at Amazon.com):

- **Alternative Medicine for Dummies** by James Dillard (Author); Audio Cassette, Abridged edition (1998), Harper Audio; ISBN: 0694520659;
<http://www.amazon.com/exec/obidos/ASIN/0694520659/icongroupinterna>
- **Complementary and Alternative Medicine Secrets** by W. Kohatsu (Editor); Hardcover (2001), Hanley & Belfus; ISBN: 1560534400;
<http://www.amazon.com/exec/obidos/ASIN/1560534400/icongroupinterna>
- **Dictionary of Alternative Medicine** by J. C. Segen; Paperback-2nd edition (2001), Appleton & Lange; ISBN: 0838516211;
<http://www.amazon.com/exec/obidos/ASIN/0838516211/icongroupinterna>
- **Eat, Drink, and Be Healthy: The Harvard Medical School Guide to Healthy Eating** by Walter C. Willett, MD, et al; Hardcover - 352 pages (2001), Simon & Schuster; ISBN: 0684863375;
<http://www.amazon.com/exec/obidos/ASIN/0684863375/icongroupinterna>
- **Encyclopedia of Natural Medicine, Revised 2nd Edition** by Michael T. Murray, Joseph E. Pizzorno; Paperback - 960 pages, 2nd Rev edition (1997), Prima Publishing; ISBN: 0761511571;
<http://www.amazon.com/exec/obidos/ASIN/0761511571/icongroupinterna>
- **Integrative Medicine: An Introduction to the Art & Science of Healing** by Andrew Weil (Author); Audio Cassette, Unabridged edition (2001), Sounds True; ISBN: 1564558541;
<http://www.amazon.com/exec/obidos/ASIN/1564558541/icongroupinterna>
- **New Encyclopedia of Herbs & Their Uses** by Deni Bown; Hardcover - 448 pages, Revised edition (2001), DK Publishing; ISBN: 078948031X;
<http://www.amazon.com/exec/obidos/ASIN/078948031X/icongroupinterna>
- **Textbook of Complementary and Alternative Medicine** by Wayne B. Jonas; Hardcover (2003), Lippincott, Williams & Wilkins; ISBN: 0683044370;
<http://www.amazon.com/exec/obidos/ASIN/0683044370/icongroupinterna>

For additional information on complementary and alternative medicine, ask your doctor or write to:

National Institutes of Health
National Center for Complementary and Alternative Medicine
Clearinghouse
P. O. Box 8218
Silver Spring, MD 20907-8218

APPENDIX C. RESEARCHING NUTRITION

Overview

Since the time of Hippocrates, doctors have understood the importance of diet and nutrition to patients' health and well-being. Since then, they have accumulated an impressive archive of studies and knowledge dedicated to this subject. Based on their experience, doctors and healthcare providers may recommend particular dietary supplements to patients with restless leg syndrome. Any dietary recommendation is based on a patient's age, body mass, gender, lifestyle, eating habits, food preferences, and health condition. It is therefore likely that different patients with restless leg syndrome may be given different recommendations. Some recommendations may be directly related to restless leg syndrome, while others may be more related to the patient's general health. These recommendations, themselves, may differ from what official sources recommend for the average person.

In this chapter we will begin by briefly reviewing the essentials of diet and nutrition that will broadly frame more detailed discussions of restless leg syndrome. We will then show you how to find studies dedicated specifically to nutrition and restless leg syndrome.

Food and Nutrition: General Principles

What Are Essential Foods?

Food is generally viewed by official sources as consisting of six basic elements: (1) fluids, (2) carbohydrates, (3) protein, (4) fats, (5) vitamins, and (6) minerals. Consuming a combination of these elements is considered to be a healthy diet:

- **Fluids** are essential to human life as 80-percent of the body is composed of water. Water is lost via urination, sweating, diarrhea, vomiting, diuretics (drugs that increase urination), caffeine, and physical exertion.
- **Carbohydrates** are the main source for human energy (thermoregulation) and the bulk of typical diets. They are mostly classified as being either simple or complex. Simple carbohydrates include sugars which are often consumed in the form of cookies, candies, or cakes. Complex carbohydrates consist of starches and dietary fibers. Starches are consumed in the form of pastas, breads, potatoes, rice, and other foods. Soluble fibers can be eaten in the form of certain vegetables, fruits, oats, and legumes. Insoluble fibers include brown rice, whole grains, certain fruits, wheat bran and legumes.
- **Proteins** are eaten to build and repair human tissues. Some foods that are high in protein are also high in fat and calories. Food sources for protein include nuts, meat, fish, cheese, and other dairy products.
- **Fats** are consumed for both energy and the absorption of certain vitamins. There are many types of fats, with many general publications recommending the intake of unsaturated fats or those low in cholesterol.

Vitamins and minerals are fundamental to human health, growth, and, in some cases, disease prevention. Most are consumed in your diet (exceptions being vitamins K and D which are produced by intestinal bacteria and sunlight on the skin, respectively). Each vitamin and mineral plays a different role in health. The following outlines essential vitamins:

- **Vitamin A** is important to the health of your eyes, hair, bones, and skin; sources of vitamin A include foods such as eggs, carrots, and cantaloupe.
- **Vitamin B¹**, also known as thiamine, is important for your nervous system and energy production; food sources for thiamine include meat, peas, fortified cereals, bread, and whole grains.
- **Vitamin B²**, also known as riboflavin, is important for your nervous system and muscles, but is also involved in the release of proteins from

nutrients; food sources for riboflavin include dairy products, leafy vegetables, meat, and eggs.

- **Vitamin B³**, also known as niacin, is important for healthy skin and helps the body use energy; food sources for niacin include peas, peanuts, fish, and whole grains
- **Vitamin B⁶**, also known as pyridoxine, is important for the regulation of cells in the nervous system and is vital for blood formation; food sources for pyridoxine include bananas, whole grains, meat, and fish.
- **Vitamin B¹²** is vital for a healthy nervous system and for the growth of red blood cells in bone marrow; food sources for vitamin B¹² include yeast, milk, fish, eggs, and meat.
- **Vitamin C** allows the body's immune system to fight various diseases, strengthens body tissue, and improves the body's use of iron; food sources for vitamin C include a wide variety of fruits and vegetables.
- **Vitamin D** helps the body absorb calcium which strengthens bones and teeth; food sources for vitamin D include oily fish and dairy products.
- **Vitamin E** can help protect certain organs and tissues from various degenerative diseases; food sources for vitamin E include margarine, vegetables, eggs, and fish.
- **Vitamin K** is essential for bone formation and blood clotting; common food sources for vitamin K include leafy green vegetables.
- **Folic Acid** maintains healthy cells and blood and, when taken by a pregnant woman, can prevent her fetus from developing neural tube defects; food sources for folic acid include nuts, fortified breads, leafy green vegetables, and whole grains.

It should be noted that one can overdose on certain vitamins which become toxic if consumed in excess (e.g. vitamin A, D, E and K).

Like vitamins, minerals are chemicals that are required by the body to remain in good health. Because the human body does not manufacture these chemicals internally, we obtain them from food and other dietary sources. The more important minerals include:

- **Calcium** is needed for healthy bones, teeth, and muscles, but also helps the nervous system function; food sources for calcium include dry beans, peas, eggs, and dairy products.
- **Chromium** is helpful in regulating sugar levels in blood; food sources for chromium include egg yolks, raw sugar, cheese, nuts, beets, whole grains, and meat.

- **Fluoride** is used by the body to help prevent tooth decay and to reinforce bone strength; sources of fluoride include drinking water and certain brands of toothpaste.
- **Iodine** helps regulate the body's use of energy by synthesizing into the hormone thyroxine; food sources include leafy green vegetables, nuts, egg yolks, and red meat.
- **Iron** helps maintain muscles and the formation of red blood cells and certain proteins; food sources for iron include meat, dairy products, eggs, and leafy green vegetables.
- **Magnesium** is important for the production of DNA, as well as for healthy teeth, bones, muscles, and nerves; food sources for magnesium include dried fruit, dark green vegetables, nuts, and seafood.
- **Phosphorous** is used by the body to work with calcium to form bones and teeth; food sources for phosphorous include eggs, meat, cereals, and dairy products.
- **Selenium** primarily helps maintain normal heart and liver functions; food sources for selenium include wholegrain cereals, fish, meat, and dairy products.
- **Zinc** helps wounds heal, the formation of sperm, and encourage rapid growth and energy; food sources include dried beans, shellfish, eggs, and nuts.

The United States government periodically publishes recommended diets and consumption levels of the various elements of food. Again, your doctor may encourage deviations from the average official recommendation based on your specific condition. To learn more about basic dietary guidelines, visit the Web site: <http://www.health.gov/dietaryguidelines/>. Based on these guidelines, many foods are required to list the nutrition levels on the food's packaging. Labeling Requirements are listed at the following site maintained by the Food and Drug Administration: <http://www.cfsan.fda.gov/~dms/lab-cons.html>. When interpreting these requirements, the government recommends that consumers become familiar with the following abbreviations before reading FDA literature:⁴⁰

- **DVs (Daily Values):** A new dietary reference term that will appear on the food label. It is made up of two sets of references, DRVs and RDIs.
- **DRVs (Daily Reference Values):** A set of dietary references that applies to fat, saturated fat, cholesterol, carbohydrate, protein, fiber, sodium, and potassium.

⁴⁰ Adapted from the FDA: <http://www.fda.gov/fdac/special/foodlabel/dvs.html>.

- **RDIs (Reference Daily Intakes):** A set of dietary references based on the Recommended Dietary Allowances for essential vitamins and minerals and, in selected groups, protein. The name “RDI” replaces the term “U.S. RDA.”
- **RDAs (Recommended Dietary Allowances):** A set of estimated nutrient allowances established by the National Academy of Sciences. It is updated periodically to reflect current scientific knowledge.

What Are Dietary Supplements?⁴¹

Dietary supplements are widely available through many commercial sources, including health food stores, grocery stores, pharmacies, and by mail. Dietary supplements are provided in many forms including tablets, capsules, powders, gel-tabs, extracts, and liquids. Historically in the United States, the most prevalent type of dietary supplement was a multivitamin/mineral tablet or capsule that was available in pharmacies, either by prescription or “over the counter.” Supplements containing strictly herbal preparations were less widely available. Currently in the United States, a wide array of supplement products are available, including vitamin, mineral, other nutrients, and botanical supplements as well as ingredients and extracts of animal and plant origin.

The Office of Dietary Supplements (ODS) of the National Institutes of Health is the official agency of the United States which has the expressed goal of acquiring “new knowledge to help prevent, detect, diagnose, and treat disease and disability, from the rarest genetic disorder to the common cold.”⁴² According to the ODS, dietary supplements can have an important impact on the prevention and management of disease and on the maintenance of health.⁴³ The ODS notes that considerable research on the effects of dietary supplements has been conducted in Asia and Europe where the use of plant products, in particular, has a long tradition. However, the

⁴¹ This discussion has been adapted from the NIH:

<http://ods.od.nih.gov/whatare/whatare.html>.

⁴² Contact: The Office of Dietary Supplements, National Institutes of Health, Building 31, Room 1B29, 31 Center Drive, MSC 2086, Bethesda, Maryland 20892-2086, Tel: (301) 435-2920, Fax: (301) 480-1845, E-mail: ods@nih.gov.

⁴³ Adapted from <http://ods.od.nih.gov/about/about.html>. The Dietary Supplement Health and Education Act defines dietary supplements as “a product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, mineral, amino acid, herb or other botanical; or a dietary substance for use to supplement the diet by increasing the total dietary intake; or a concentrate, metabolite, constituent, extract, or combination of any ingredient described above; and intended for ingestion in the form of a capsule, powder, softgel, or gelcap, and not represented as a conventional food or as a sole item of a meal or the diet.”

overwhelming majority of supplements have not been studied scientifically. To explore the role of dietary supplements in the improvement of health care, the ODS plans, organizes, and supports conferences, workshops, and symposia on scientific topics related to dietary supplements. The ODS often works in conjunction with other NIH Institutes and Centers, other government agencies, professional organizations, and public advocacy groups.

To learn more about official information on dietary supplements, visit the ODS site at <http://ods.od.nih.gov/whatare/whatare.html>. Or contact:

The Office of Dietary Supplements
National Institutes of Health
Building 31, Room 1B29
31 Center Drive, MSC 2086
Bethesda, Maryland 20892-2086
Tel: (301) 435-2920
Fax: (301) 480-1845
E-mail: ods@nih.gov

Finding Studies on Restless Leg Syndrome

The NIH maintains an office dedicated to patient nutrition and diet. The National Institutes of Health's Office of Dietary Supplements (ODS) offers a searchable bibliographic database called the IBIDS (International Bibliographic Information on Dietary Supplements). The IBIDS contains over 460,000 scientific citations and summaries about dietary supplements and nutrition as well as references to published international, scientific literature on dietary supplements such as vitamins, minerals, and botanicals.⁴⁴ IBIDS is available to the public free of charge through the ODS Internet page: <http://ods.od.nih.gov/databases/ibids.html>.

After entering the search area, you have three choices: (1) IBIDS Consumer Database, (2) Full IBIDS Database, or (3) Peer Reviewed Citations Only. We recommend that you start with the Consumer Database. While you may not find references for the topics that are of most interest to you, check back periodically as this database is frequently updated. More studies can be

⁴⁴ Adapted from <http://ods.od.nih.gov>. IBIDS is produced by the Office of Dietary Supplements (ODS) at the National Institutes of Health to assist the public, healthcare providers, educators, and researchers in locating credible, scientific information on dietary supplements. IBIDS was developed and will be maintained through an interagency partnership with the Food and Nutrition Information Center of the National Agricultural Library, U.S. Department of Agriculture.

found by searching the Full IBIDS Database. Healthcare professionals and researchers generally use the third option, which lists peer-reviewed citations. In all cases, we suggest that you take advantage of the “Advanced Search” option that allows you to retrieve up to 100 fully explained references in a comprehensive format. Type “restless leg syndrome” (or synonyms) into the search box. To narrow the search, you can also select the “Title” field.

The following information is typical of that found when using the “Full IBIDS Database” when searching using “restless leg syndrome” (or a synonym):

- **Pergolide: treatment of choice in restless legs syndrome (RLS) and nocturnal myoclonus syndrome (NMS). A double-blind randomized crossover trial of pergolide versus L-Dopa.**
 Author(s): Department of Psychiatry, Georg August University, Gottingen, Federal Republic of Germany.
 Source: Staedt, J Wassmuth, F Ziemann, U Hajak, G Ruther, E Stoppe, G J-Neural-Transm. 1997; 104(4-5): 461-8
- **The treatment of the restless leg syndrome with or without periodic leg movements in sleep.**
 Author(s): Centre d'Etude du Sommeil, Hopital du Sacre-Coeur, Montreal, Quebec.
 Source: Montplaisir, J Lapierre, O Warnes, H Pelletier, G Sleepage 1992 October; 15(5): 391-5 0161-8105
- **Treatment of nocturnal leg cramps and restless leg syndrome.**
 Author(s): Medical College of Virginia/Virginia Commonwealth University (MCV/VCU).
 Source: Walton, T Kolb, K W Clin-Pharm. 1991 June; 10(6): 427-8 0278-2677
- **Treatment of restless leg syndrome with pergolide.**
 Author(s): University of Utah, Salt Lake City, USA. kgunning@pharm.utah.edu
 Source: Gunning, K Gay, C J-Fam-Pract. 1999 April; 48(4): 250 0094-3509

Federal Resources on Nutrition

In addition to the IBIDS, the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) provide many sources of information on general nutrition and health. Recommended resources include:

- healthfinder®, HHS's gateway to health information, including diet and nutrition:
<http://www.healthfinder.gov/scripts/SearchContext.asp?topic=238&page=0>
- The United States Department of Agriculture's Web site dedicated to nutrition information: **www.nutrition.gov**
- The Food and Drug Administration's Web site for federal food safety information: **www.foodsafety.gov**
- The National Action Plan on Overweight and Obesity sponsored by the United States Surgeon General:
<http://www.surgeongeneral.gov/topics/obesity/>
- The Center for Food Safety and Applied Nutrition has an Internet site sponsored by the Food and Drug Administration and the Department of Health and Human Services: **<http://vm.cfsan.fda.gov/>**
- Center for Nutrition Policy and Promotion sponsored by the United States Department of Agriculture: **<http://www.usda.gov/cnpp/>**
- Food and Nutrition Information Center, National Agricultural Library sponsored by the United States Department of Agriculture: **<http://www.nal.usda.gov/fnic/>**
- Food and Nutrition Service sponsored by the United States Department of Agriculture: **<http://www.fns.usda.gov/fns/>**

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering food and nutrition. The following is a representative sample:

- AOL: **<http://search.aol.com/cat.adp?id=174&layer=&from=subcats>**
- Family Village: **http://www.familyvillage.wisc.edu/med_nutrition.html**
- Google: **<http://directory.google.com/Top/Health/Nutrition/>**
- Healthnotes: **<http://www.thedacare.org/healthnotes/>**
- Open Directory Project: **<http://dmoz.org/Health/Nutrition/>**

- Yahoo.com: <http://dir.yahoo.com/Health/Nutrition/>
- WebMD® Health: <http://my.webmd.com/nutrition>
- WholeHealthMD.com:
<http://www.wholehealthmd.com/reflib/0,1529,,00.html>

The following is a specific Web list relating to restless leg syndrome; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **Minerals**

Bromocriptine

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Folate

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Iron

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

- **Food and Diet**

Coffee

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Crackers

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Hypoglycemia

Source: Healthnotes, Inc.; www.healthnotes.com

Hyperlink:

http://www.thedacare.org/healthnotes/Concern/Restless_Legs_Syndrome.htm

Milk

Source: Integrative Medicine Communications; www.onemedicine.com

Hyperlink:

<http://www.drkoop.com/interactivemedicine/ConsConditions/Insomnia.html>

Vocabulary Builder

The following vocabulary builder defines words used in the references in this chapter that have not been defined in previous chapters:

Bacteria: Unicellular prokaryotic microorganisms which generally possess rigid cell walls, multiply by cell division, and exhibit three principal forms: round or coccoid, rodlike or bacillary, and spiral or spirochetal. [NIH]

Cholesterol: A soft, waxy substance manufactured by the body and used in the production of hormones, bile acid, and vitamin D and present in all parts of the body, including the nervous system, muscle, skin, liver, intestines, and heart. Blood cholesterol circulates in the bloodstream. Dietary cholesterol is found in foods of animal origin. [NIH]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

Iodine: A nonmetallic element of the halogen group that is represented by the atomic symbol I, atomic number 53, and atomic weight of 126.90. It is a nutritionally essential element, especially important in thyroid hormone synthesis. In solution, it has anti-infective properties and is used topically. [NIH]

Neural: 1. pertaining to a nerve or to the nerves. 2. situated in the region of the spinal axis, as the neural arch. [EU]

Pergolide: A long-acting dopamine agonist which is effective in the treatment of Parkinson's disease and hyperprolactinemia. It has also been observed to have antihypertensive effects. [NIH]

Potassium: An element that is in the alkali group of metals. It has an atomic symbol K, atomic number 19, and atomic weight 39.10. It is the chief cation in the intracellular fluid of muscle and other cells. Potassium ion is a strong electrolyte and it plays a significant role in the regulation of fluid volume and maintenance of the water-electrolyte balance. [NIH]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [NIH]

Psychiatry: The medical science that deals with the origin, diagnosis, prevention, and treatment of mental disorders. [NIH]

Riboflavin: Nutritional factor found in milk, eggs, malted barley, liver, kidney, heart, and leafy vegetables. The richest natural source is yeast. It occurs in the free form only in the retina of the eye, in whey, and in urine; its principal forms in tissues and cells are as FMN and FAD. [NIH]

Selenium: An element with the atomic symbol Se, atomic number 34, and atomic weight 78.96. It is an essential micronutrient for mammals and other animals but is toxic in large amounts. Selenium protects intracellular structures against oxidative damage. It is an essential component of glutathione peroxidase. [NIH]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

APPENDIX D. FINDING MEDICAL LIBRARIES

Overview

At a medical library you can find medical texts and reference books, consumer health publications, specialty newspapers and magazines, as well as medical journals. In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Before going to the library, highlight the references mentioned in this sourcebook that you find interesting. Focus on those items that are not available via the Internet, and ask the reference librarian for help with your search. He or she may know of additional resources that could be helpful to you. Most importantly, your local public library and medical libraries have Interlibrary Loan programs with the National Library of Medicine (NLM), one of the largest medical collections in the world. According to the NLM, most of the literature in the general and historical collections of the National Library of Medicine is available on interlibrary loan to any library. NLM's interlibrary loan services are only available to libraries. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.⁴⁵

⁴⁵ Adapted from the NLM: <http://www.nlm.nih.gov/psd/cas/interlibrary.html>.

Finding a Local Medical Library

The quickest method to locate medical libraries is to use the Internet-based directory published by the National Network of Libraries of Medicine (NN/LM). This network includes 4626 members and affiliates that provide many services to librarians, health professionals, and the public. To find a library in your area, simply visit <http://nnlm.gov/members/adv.html> or call 1-800-338-7657.

Medical Libraries Open to the Public

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries that are generally open to the public and have reference facilities. The following is the NLM's list plus hyperlinks to each library Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of libraries recommended by the National Library of Medicine (sorted alphabetically by name of the U.S. state or Canadian province where the library is located):⁴⁶

- **Alabama:** Health InfoNet of Jefferson County (Jefferson County Library Cooperative, Lister Hill Library of the Health Sciences), <http://www.uab.edu/infonet/>
- **Alabama:** Richard M. Scrushy Library (American Sports Medicine Institute), <http://www.asmi.org/LIBRARY.HTM>
- **Arizona:** Samaritan Regional Medical Center: The Learning Center (Samaritan Health System, Phoenix, Arizona), <http://www.samaritan.edu/library/bannerlibs.htm>
- **California:** Kris Kelly Health Information Center (St. Joseph Health System), <http://www.humboldt1.com/~kkhic/index.html>
- **California:** Community Health Library of Los Gatos (Community Health Library of Los Gatos), <http://www.healthlib.org/orgresources.html>
- **California:** Consumer Health Program and Services (CHIPS) (County of Los Angeles Public Library, Los Angeles County Harbor-UCLA Medical Center Library) - Carson, CA, <http://www.colapublib.org/services/chips.html>
- **California:** Gateway Health Library (Sutter Gould Medical Foundation)
- **California:** Health Library (Stanford University Medical Center), <http://www-med.stanford.edu/healthlibrary/>

⁴⁶ Abstracted from <http://www.nlm.nih.gov/medlineplus/libraries.html>.

- **California:** Patient Education Resource Center - Health Information and Resources (University of California, San Francisco), <http://sfghdean.ucsf.edu/barnett/PERC/default.asp>
- **California:** Redwood Health Library (Petaluma Health Care District), <http://www.phcd.org/rdwdlib.html>
- **California:** San José PlaneTree Health Library, <http://planetreesanjose.org/>
- **California:** Sutter Resource Library (Sutter Hospitals Foundation), <http://go.sutterhealth.org/comm/resc-library/sac-resources.html>
- **California:** University of California, Davis. Health Sciences Libraries
- **California:** ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System), <http://www.valleycare.com/library.html>
- **California:** Washington Community Health Resource Library (Washington Community Health Resource Library), <http://www.healthlibrary.org/>
- **Colorado:** William V. Gervasini Memorial Library (Exempla Healthcare), <http://www.exempla.org/conslib.htm>
- **Connecticut:** Hartford Hospital Health Science Libraries (Hartford Hospital), <http://www.harthosp.org/library/>
- **Connecticut:** Healthnet: Connecticut Consumer Health Information Center (University of Connecticut Health Center, Lyman Maynard Stowe Library), <http://library.uchc.edu/departm/hnet/>
- **Connecticut:** Waterbury Hospital Health Center Library (Waterbury Hospital), <http://www.waterburyhospital.com/library/consumer.shtml>
- **Delaware:** Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute), http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm
- **Delaware:** Lewis B. Flinn Library (Delaware Academy of Medicine), <http://www.delamed.org/chls.html>
- **Georgia:** Family Resource Library (Medical College of Georgia), http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/frl.htm
- **Georgia:** Health Resource Center (Medical Center of Central Georgia), <http://www.mccg.org/hrc/hrchome.asp>
- **Hawaii:** Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library), <http://hml.org/CHIS/>

- **Idaho:** DeArmond Consumer Health Library (Kootenai Medical Center), <http://www.nicon.org/DeArmond/index.htm>
- **Illinois:** Health Learning Center of Northwestern Memorial Hospital (Northwestern Memorial Hospital, Health Learning Center), http://www.nmh.org/health_info/hlc.html
- **Illinois:** Medical Library (OSF Saint Francis Medical Center), <http://www.osfsaintfrancis.org/general/library/>
- **Kentucky:** Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital), <http://www.centralbap.com/education/community/library.htm>
- **Kentucky:** University of Kentucky - Health Information Library (University of Kentucky, Chandler Medical Center, Health Information Library), <http://www.mc.uky.edu/PatientEd/>
- **Louisiana:** Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation), <http://www.ochsner.org/library/>
- **Louisiana:** Louisiana State University Health Sciences Center Medical Library-Shreveport, <http://lib-sh.lsuhscc.edu/>
- **Maine:** Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital), <http://www.fchn.org/fmh/lib.htm>
- **Maine:** Gerrish-True Health Sciences Library (Central Maine Medical Center), <http://www.cmmc.org/library/library.html>
- **Maine:** Hadley Parrot Health Science Library (Eastern Maine Healthcare), <http://www.emh.org/hll/hpl/guide.htm>
- **Maine:** Maine Medical Center Library (Maine Medical Center), <http://www.mmc.org/library/>
- **Maine:** Parkview Hospital, <http://www.parkviewhospital.org/communit.htm#Library>
- **Maine:** Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center), <http://www.smmc.org/services/service.php3?choice=10>
- **Maine:** Stephens Memorial Hospital Health Information Library (Western Maine Health), http://www.wmhcc.com/hil_frame.html
- **Manitoba, Canada:** Consumer & Patient Health Information Service (University of Manitoba Libraries), <http://www.umanitoba.ca/libraries/units/health/reference/chis.html>
- **Manitoba, Canada:** J.W. Crane Memorial Library (Deer Lodge Centre), <http://www.deerlodge.mb.ca/library/libraryservices.shtml>

- **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Md., Dept. of Public Libraries, Wheaton Regional Library), <http://www.mont.lib.md.us/healthinfo/hic.asp>
- **Massachusetts:** Baystate Medical Center Library (Baystate Health System), <http://www.baystatehealth.com/1024/>
- **Massachusetts:** Boston University Medical Center Alumni Medical Library (Boston University Medical Center), <http://med-libwww.bu.edu/library/lib.html>
- **Massachusetts:** Lowell General Hospital Health Sciences Library (Lowell General Hospital), <http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm>
- **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital), http://www.nebh.org/health_lib.asp
- **Massachusetts:** St. Luke's Hospital Health Sciences Library (St. Luke's Hospital), <http://www.southcoast.org/library/>
- **Massachusetts:** Treadwell Library Consumer Health Reference Center (Massachusetts General Hospital), <http://www.mgh.harvard.edu/library/chrcindex.html>
- **Massachusetts:** UMass HealthNet (University of Massachusetts Medical School), <http://healthnet.umassmed.edu/>
- **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services), <http://www.botsfordlibrary.org/consumer.htm>
- **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers), <http://www.providence-hospital.org/library/>
- **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center), <http://www.mgh.org/center.html>
- **Michigan:** Patient Education Resource Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center), <http://www.cancer.med.umich.edu/learn/leares.htm>
- **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information, <http://www.sladen.hfhs.org/library/consumer/index.html>
- **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center), <http://www.saintpatrick.org/chi/librarydetail.php3?ID=41>

- **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section), <http://caphis.mlanet.org/directory/index.html>
- **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, <http://nnlm.gov/>
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), <http://nnlm.gov/members/>
- **Nevada:** Health Science Library, West Charleston Library (Las Vegas Clark County Library District), http://www.lvccld.org/special_collections/medical/index.htm
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library), http://www.dartmouth.edu/~biomed/resources.html#conshealth.html#
- **New Jersey:** Consumer Health Library (Rahway Hospital), <http://www.rahwayhospital.com/library.htm>
- **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center), <http://www.englewoodhospital.com/links/index.htm>
- **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center), <http://www.geocities.com/ResearchTriangle/9360/>
- **New York:** Choices in Health Information (New York Public Library) - NLM Consumer Pilot Project participant, <http://www.nypl.org/branch/health/links.html>
- **New York:** Health Information Center (Upstate Medical University, State University of New York), <http://www.upstate.edu/library/hic/>
- **New York:** Health Sciences Library (Long Island Jewish Medical Center), <http://www.lij.edu/library/library.html>
- **New York:** ViaHealth Medical Library (Rochester General Hospital), <http://www.nyam.org/library/>
- **Ohio:** Consumer Health Library (Akron General Medical Center, Medical & Consumer Health Library), <http://www.akrongeneral.org/hwlibrary.htm>
- **Oklahoma:** Saint Francis Health System Patient/Family Resource Center (Saint Francis Health System), <http://www.sfh-tulsa.com/patientfamilycenter/default.asp>

- **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center), <http://www.mcmc.net/phrc/>
- **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center), <http://www.hmc.psu.edu/commhealth/>
- **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center), <http://www.geisinger.edu/education/commlib.shtml>
- **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital), <http://www.mth.org/healthwellness.html>
- **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System), <http://www.hsls.pitt.edu/chi/hhrcinfo.html>
- **Pennsylvania:** Koop Community Health Information Center (College of Physicians of Philadelphia), <http://www.collphyphil.org/kooppg1.shtml>
- **Pennsylvania:** Learning Resources Center - Medical Library (Susquehanna Health System), <http://www.shscare.org/services/lrc/index.asp>
- **Pennsylvania:** Medical Library (UPMC Health System), <http://www.upmc.edu/passavant/library.htm>
- **Quebec, Canada:** Medical Library (Montreal General Hospital), <http://ww2.mcgill.ca/mghlib/>
- **South Dakota:** Rapid City Regional Hospital - Health Information Center (Rapid City Regional Hospital, Health Information Center), <http://www.rcrh.org/education/LibraryResourcesConsumers.htm>
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), <http://hhw.library.tmc.edu/>
- **Texas:** Matustik Family Resource Center (Cook Children's Health Care System), http://www.cookchildrens.com/Matustik_Library.html
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), <http://www.kvch.com/>
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center), <http://www.swmedctr.com/Home/>

APPENDIX E. MORE ON PROBLEM SLEEPINESS

Overview⁴⁷

Everyone feels sleepy at times. However, when sleepiness interferes with daily routines and activities, or reduces the ability to function, it is called “problem sleepiness.” A person can be sleepy without realizing it. For example, a person may not feel sleepy during activities such as talking and listening to music at a party, but the same person can fall asleep while driving home afterward.

The following appendix is reproduced and adapted from the National Heart, Lung, and Blood Institute publication dedicated to problem sleepiness.

What Causes Problem Sleepiness?

You may have problem sleepiness if you:

- Consistently do not get enough sleep
- Get poor quality sleep
- Fall asleep while driving
- Struggle to stay awake when inactive such as when watching television or reading
- Have difficulty paying attention or concentrating at work, school, or home
- Have performance problems at work or school

⁴⁷ Adapted from the National Heart, Lung, and Blood Institute:
http://www.nhlbi.nih.gov/health/public/sleep/pslp_fs.pdf.

- Are often told by others that you are sleepy
- Have difficulty remembering
- Have slowed responses
- Have difficulty controlling your emotions
- Must take naps on most days

Sleepiness can be due to the body's natural daily sleep-wake cycles, inadequate sleep, sleep disorders, or certain drugs.

Sleep-Wake Cycle

Each day there are two periods when the body experiences a natural tendency toward sleepiness: during the late night hours (generally between midnight and 7 a.m.) and again during the midafternoon (generally between 1 p.m. and 4 p.m.). If people are awake during these times, they have a higher risk of falling asleep unintentionally, especially if they haven't been getting enough sleep.

Inadequate Sleep

The amount of sleep needed each night varies among people. Each person needs a particular amount of sleep in order to be fully alert throughout the day. Research has shown that when healthy adults are allowed to sleep unrestricted, the average time slept is 8 to 8.5 hours. Some people need more than that to avoid problem sleepiness; others need less.

If a person does not get enough sleep, even on one night, a "sleep debt" begins to build and increases until enough sleep is obtained. Problem sleepiness occurs as the debt accumulates. Many people do not get enough sleep during the work week and then sleep longer on the weekends or days off to reduce their sleep debt. If too much sleep has been lost, sleeping in on the weekend may not completely reverse the effects of not getting enough sleep during the week.

Sleep Disorders

Sleep disorders such as sleep apnea, narcolepsy, restless legs syndrome, and insomnia can cause problem sleepiness. *Sleep apnea* is a serious disorder in

which a person's breathing is interrupted during sleep, causing the individual to awaken many times during the night and experience problem sleepiness during the day. People with *narcolepsy* have excessive sleepiness during the day, even after sleeping enough at night. They may fall asleep at inappropriate times and places. *Restless legs syndrome (RLS)* causes a person to experience unpleasant sensations in the legs, often described as creeping, crawling, pulling, or painful. These sensations frequently occur in the evening, making it difficult for people with RLS to fall asleep, leading to problem sleepiness during the day. *Insomnia* is the perception of poor-quality sleep due to difficulty falling asleep, waking up during the night with difficulty returning to sleep, waking up too early in the morning, or unrefreshing sleep. Any of these sleep disorders can cause problem sleepiness.

Medical Conditions/Drugs

Certain medical conditions and drugs, including prescription medications, can also disrupt sleep and cause problem sleepiness. Examples include:

- Chronic illnesses such as asthma, congestive heart failure, rheumatoid arthritis, or any other chronically painful disorder.
- Some medications to treat high blood pressure, some heart medications, and asthma medications such as theophylline.
- Alcohol—Although some people use alcohol to help themselves fall asleep, it causes sleep disruption during the night, which can lead to problem sleepiness during the day. Alcohol is also a sedating drug that can, even in small amounts, make a sleepy person much more sleepy and at greater risk for car crashes and performance problems.
- Caffeine—Whether consumed in coffee, tea, soft drinks, or medications, caffeine makes it harder for many people to fall asleep and stay asleep. Caffeine stays in the body for about 3 to 7 hours, so even when taken earlier in the day it can cause problems with sleep at night.
- Nicotine from cigarettes or a skin patch is a stimulant and makes it harder to fall asleep and stay asleep.

Problem Sleepiness and Adolescents

Many U.S. high school and college students have signs of problem sleepiness, such as:

- Difficulty getting up for school
- Falling asleep at school
- Struggling to stay awake while doing homework

The need for sleep may be 9 hours or more per night as a person goes through adolescence. At the same time, many teens begin to show a preference for a later bed time, which may be due to a biological change. Teens tend to stay up later but have to get up early for school, resulting in their getting much less sleep than they need.

Many factors contribute to problem sleepiness in teens and young adults, but the main causes are not getting enough sleep and irregular sleep schedules. Some of the factors that influence adolescent sleep include:

- Social activities with peers that lead to later bedtimes
- Homework to be done in the evenings
- Early wake-up times due to early school start times
- Parents being less involved in setting and enforcing bedtimes
- Employment, sports, or other extracurricular activities that decrease the time available for sleep

Teens and young adults who do not get enough sleep are at risk for problems such as:

- Automobile crashes
- Poor performance in school and poor grades
- Depressed moods
- Problems with peer and adult relationships

Many adolescents have part-time jobs in addition to their classes and other activities. High school students who work more than 20 hours per week have more problem sleepiness and may use more caffeine, nicotine, and alcohol than those who work less than 20 hours per week or not at all.

Shift Work And Problem Sleepiness

About 20 million Americans (20 to 25 percent of workers) perform shift work. Most shift workers get less sleep over 24 hours than day workers. Sleep loss is greatest for night shift workers, those who work early morning shifts, and female shift workers with children at home. About 60 to 70 percent of shift workers have difficulty sleeping and/or problem sleepiness.

The human sleep-wake system is designed to prepare the body and mind for sleep at night and wakefulness during the day. These natural rhythms make it difficult to sleep during daylight hours and to stay awake during the night hours, even in people who are well rested. It is possible that the human body never completely adjusts to nighttime activity and daytime sleep, even in those who work permanent night shifts.

In addition to the sleep-wake system, environmental factors can influence sleepiness in shift workers. Because our society is strongly day-oriented, shift workers who try to sleep during the day are often interrupted by noise, light, telephones, family members, and other distractions. In contrast, the nighttime sleep of day workers is largely protected by social customs that keep noises and interruptions to a minimum.

Problem sleepiness in shift workers may result in:

- Increased risk for automobile crashes, especially while driving home after the night shift
- Decreased quality of life
- Decreased productivity (night work performance may be slower and less accurate than day performance)
- Increased risk of accidents and injuries at work

What Can Help?

Sleep – There Is No Substitute!

Many people simply do not allow enough time for sleep on a regular basis. A first step may be to evaluate daily activities and sleep-wake patterns to determine how much sleep is obtained. If you are consistently getting less than 8 hours of sleep per night, more sleep may be needed. A good approach is to gradually move to an earlier bedtime. For example, if an extra hour of sleep is needed, try going to bed 15 minutes earlier each night for four nights

and then keep the last bedtime. This method will increase the amount of time in bed without causing a sudden change in schedule. However, if work or family schedules do not permit the earlier bedtime, a 30- to 60-minute daily nap may help.

Medications/Drugs

In general, medications do not help problem sleepiness, and some make it worse. *Caffeine* can reduce sleepiness and increase alertness, but only temporarily. It can also cause problem sleepiness to become worse by interrupting sleep.

While *alcohol* may shorten the time it takes to fall asleep, it can disrupt sleep later in the night, and therefore add to the problem sleepiness.

Medications may be prescribed for patients in certain situations. For example, the short-term use of sleeping pills has been shown to be helpful in patients diagnosed with acute insomnia. Long-term use of sleep medication is recommended only for the treatment of specific sleep disorders.

If You're Sleepy – Don't Drive!

A person who is sleepy and drives is at high risk for an automobile crash. Planning ahead may help reduce that risk. For example, the following tips may help when planning a long distance car trip:

- Get a good night's sleep before leaving
- Avoid driving between midnight and 7 a.m.
- Change drivers often to allow for rest periods
- Schedule frequent breaks

If you are a shift worker, the following may help:

- Decreasing the amount of night work
- Increasing the total amount of sleep by adding naps and lengthening the amount of time allotted for sleep
- Increasing the intensity of light at work
- Having a predictable schedule of night shifts
- Eliminating sound and light in the bedroom during daytime sleep

- Using caffeine (only during the first part of the shift) to promote alertness at night
- Possibly using prescription sleeping pills to help daytime sleep on an occasional basis (check with your doctor)

If you think you are getting enough sleep, but still feel sleepy during the day, check with your doctor to be sure your sleepiness is not due to a sleep disorder.

Vocabulary Builder

Adolescence: The period of life beginning with the appearance of secondary sex characteristics and terminating with the cessation of somatic growth. The years usually referred to as adolescence lie between 13 and 18 years of age. [NIH]

Anxiety: The unpleasant emotional state consisting of psychophysiological responses to anticipation of unreal or imagined danger, ostensibly resulting from unrecognized intrapsychic conflict. Physiological concomitants include increased heart rate, altered respiration rate, sweating, trembling, weakness, and fatigue; psychological concomitants include feelings of impending danger, powerlessness, apprehension, and tension. [EU]

Nicotine: Nicotine is highly toxic alkaloid. It is the prototypical agonist at nicotinic cholinergic receptors where it dramatically stimulates neurons and ultimately blocks synaptic transmission. Nicotine is also important medically because of its presence in tobacco smoke. [NIH]

Stimulant: 1. producing stimulation; especially producing stimulation by causing tension on muscle fibre through the nervous tissue. 2. an agent or remedy that produces stimulation. [EU]

ONLINE GLOSSARIES

The Internet provides access to a number of free-to-use medical dictionaries and glossaries. The National Library of Medicine has compiled the following list of online dictionaries:

- ADAM Medical Encyclopedia (A.D.A.M., Inc.), comprehensive medical reference: <http://www.nlm.nih.gov/medlineplus/encyclopedia.html>
- MedicineNet.com Medical Dictionary (MedicineNet, Inc.):
<http://www.medterms.com/Script/Main/hp.asp>
- Merriam-Webster Medical Dictionary (Inteli-Health, Inc.):
<http://www.intelihealth.com/IH/>
- Multilingual Glossary of Technical and Popular Medical Terms in Eight European Languages (European Commission) - Danish, Dutch, English, French, German, Italian, Portuguese, and Spanish:
<http://allserv.rug.ac.be/~rvdstich/eugloss/welcome.html>
- On-line Medical Dictionary (CancerWEB):
<http://www.graylab.ac.uk/omd/>
- Technology Glossary (National Library of Medicine) - Health Care Technology: <http://www.nlm.nih.gov/nichsr/ta101/ta10108.htm>
- Terms and Definitions (Office of Rare Diseases):
http://rarediseases.info.nih.gov/ord/glossary_a-e.html

Beyond these, MEDLINEplus contains a very user-friendly encyclopedia covering every aspect of medicine (licensed from A.D.A.M., Inc.). The ADAM Medical Encyclopedia Web site address is <http://www.nlm.nih.gov/medlineplus/encyclopedia.html>. ADAM is also available on commercial Web sites such as Web MD (http://my.webmd.com/adam/asset/adam_disease_articles/a_to_z/a) and drkoop.com (<http://www.drkoop.com/>). Topics of interest can be researched by using keywords before continuing elsewhere, as these basic definitions and concepts will be useful in more advanced areas of research. You may choose to print various pages specifically relating to restless leg syndrome and keep them on file. The NIH, in particular, suggests that patients with restless leg syndrome visit the following Web sites in the ADAM Medical Encyclopedia:

- **Basic Guidelines for Restless Leg Syndrome**

Restless leg syndrome

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/000807.htm>

RLS

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/000807.htm>

- **Signs & Symptoms for Restless Leg Syndrome**

Abnormal sensations

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003206.htm>

Anxiety

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003211.htm>

Claudication

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003184.htm>

Confusion

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003205.htm>

Depression

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003213.htm>

Insomnia

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003210.htm>

Muscle

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003193.htm>

Sleepiness

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003208.htm>

Sleeping difficulty

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003210.htm>

Stress

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/003211.htm>

- **Background Topics for Restless Leg Syndrome**

Incidence

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/002387.htm>

Peripheral

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/002273.htm>

Relieved by

Web site:

<http://www.nlm.nih.gov/medlineplus/ency/article/002288.htm>

Online Dictionary Directories

The following are additional online directories compiled by the National Library of Medicine, including a number of specialized medical dictionaries and glossaries:

- Medical Dictionaries: Medical & Biological (World Health Organization):
<http://www.who.int/hlt/virtuallibrary/English/diction.htm#Medical>
- MEL-Michigan Electronic Library List of Online Health and Medical Dictionaries (Michigan Electronic Library):
<http://mel.lib.mi.us/health/health-dictionaries.html>
- Patient Education: Glossaries (DMOZ Open Directory Project):
http://dmoz.org/Health/Education/Patient_Education/Glossaries/
- Web of Online Dictionaries (Bucknell University):
<http://www.yourdictionary.com/diction5.html#medicine>

RESTLESS LEG SYNDROME GLOSSARY

The following is a complete glossary of terms used in this sourcebook. The definitions are derived from official public sources including the National Institutes of Health [NIH] and the European Union [EU]. After this glossary, we list a number of additional hardbound and electronic glossaries and dictionaries that you may wish to consult.

Adolescence: The period of life beginning with the appearance of secondary sex characteristics and terminating with the cessation of somatic growth. The years usually referred to as adolescence lie between 13 and 18 years of age. [NIH]

American Heart Association: A voluntary organization concerned with the prevention and treatment of heart and vascular diseases. [NIH]

Anemia: A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin. [NIH]

Angioscopy: Endoscopic examination, therapy or surgery performed on the interior of blood vessels. [NIH]

Anxiety: The unpleasant emotional state consisting of psychophysiological responses to anticipation of unreal or imagined danger, ostensibly resulting from unrecognized intrapsychic conflict. Physiological concomitants include increased heart rate, altered respiration rate, sweating, trembling, weakness, and fatigue; psychological concomitants include feelings of impending danger, powerlessness, apprehension, and tension. [EU]

Aorta: Blood vessel that delivers oxygen-rich blood from the left ventricle to the body; it is the largest blood vessel in the body. [NIH]

Apnea: A transient absence of spontaneous respiration. [NIH]

Arterial: Pertaining to an artery or to the arteries. [EU]

Artery: Vessel-carrying blood from the heart to various parts of the body. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Asthenia: Lack or loss of strength and energy, weakness. [EU]

Bacteria: Unicellular prokaryotic microorganisms which generally possess rigid cell walls, multiply by cell division, and exhibit three principal forms: round or coccid, rodlike or bacillary, and spiral or spirochetal. [NIH]

Baths: The immersion or washing of the body or any of its parts in water or other medium for cleansing or medical treatment. It includes bathing for personal hygiene as well as for medical purposes with the addition of

therapeutic agents, such as alkalines, antiseptics, oil, etc. [NIH]

Benzodiazepines: A two-ring heterocyclic compound consisting of a benzene ring fused to a diazepine ring. Permitted is any degree of hydrogenation, any substituents and any H-isomer. [NIH]

Biomechanics: The study of the application of mechanical laws and the action of forces to living structures. [NIH]

Bloom Syndrome: An autosomal recessive disorder characterized by telangiectatic erythema of the face, photosensitivity, dwarfism, and other abnormalities. [NIH]

Capsules: Hard or soft soluble containers used for the oral administration of medicine. [NIH]

Carbohydrates: A nutrient that supplies 4 calories/gram. They may be simple or complex. Simple carbohydrates are called sugars, and complex carbohydrates are called starch and fiber (cellulose). An organic compound—containing carbon, hydrogen, and oxygen—that is formed by photosynthesis in plants. Carbohydrates are heat producing and are classified as monosaccharides, disaccharides, or polysaccharides. [NIH]

Cardiology: The study of the heart, its physiology, and its functions. [NIH]

Cardiopulmonary: Pertaining to the heart and lungs. [EU]

Cholesterol: A soft, waxy substance manufactured by the body and used in the production of hormones, bile acid, and vitamin D and present in all parts of the body, including the nervous system, muscle, skin, liver, intestines, and heart. Blood cholesterol circulates in the bloodstream. Dietary cholesterol is found in foods of animal origin. [NIH]

Cholinergic: Resembling acetylcholine in pharmacological action; stimulated by or releasing acetylcholine or a related compound. [EU]

Chronic: Of long duration; frequently recurring. [NIH]

Claudication: Limping or lameness. [EU]

Confusion: Disturbed orientation in regard to time, place, or person, sometimes accompanied by disordered consciousness. [EU]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

Deprivation: Loss or absence of parts, organs, powers, or things that are needed. [EU]

Diarrhea: Passage of excessively liquid or excessively frequent stools. [NIH]

Distal: Remote; farther from any point of reference; opposed to proximal. In dentistry, used to designate a position on the dental arch farther from the median line of the jaw. [EU]

Edema: Abnormal fluid accumulation in body tissues. [NIH]

Electrophysiological: Pertaining to electrophysiology, that is a branch of physiology that is concerned with the electric phenomena associated with living bodies and involved in their functional activity. [EU]

Extremity: A limb; an arm or leg (membrum); sometimes applied specifically to a hand or foot. [EU]

Fatigue: The state of weariness following a period of exertion, mental or physical, characterized by a decreased capacity for work and reduced efficiency to respond to stimuli. [NIH]

Fetus: Unborn offspring from 7 or 8 weeks after conception until birth. [NIH]

Fibula: The bone of the lower leg lateral to and smaller than the tibia. In proportion to its length, it is the most slender of the long bones. [NIH]

Fistula: An abnormal passage or communication, usually between two internal organs, or leading from an internal organ to the surface of the body; frequently designated according to the organs or parts with which it communicates, as anovaginal, brochocutaneous, hepatopleural, pulmonoperitoneal, rectovaginal, urethrovaginal, and the like. Such passages are frequently created experimentally for the purpose of obtaining body secretions for physiologic study. [EU]

Gait: Manner or style of walking. [NIH]

Homogeneous: Consisting of or composed of similar elements or ingredients; of a uniform quality throughout. [EU]

Idiopathic: Results from an unknown cause. [NIH]

Insomnia: Inability to sleep; abnormal wakefulness. [EU]

Intermittent: Occurring at separated intervals; having periods of cessation of activity. [EU]

Intestinal: Pertaining to the intestine. [EU]

Intrinsic: Situated entirely within or pertaining exclusively to a part. [EU]

Iodine: A nonmetallic element of the halogen group that is represented by the atomic symbol I, atomic number 53, and atomic weight of 126.90. It is a nutritionally essential element, especially important in thyroid hormone synthesis. In solution, it has anti-infective properties and is used topically. [NIH]

Ischemia: Deficiency of blood in a part, due to functional constriction or actual obstruction of a blood vessel. [EU]

Isotonic: A biological term denoting a solution in which body cells can be bathed without a net flow of water across the semipermeable cell membrane. Also, denoting a solution having the same tonicity as some other solution with which it is compared, such as physiologic salt solution and the blood

serum. [EU]

Lactation: The period of the secretion of milk. [EU]

Levodopa: The naturally occurring form of dopa and the immediate precursor of dopamine. Unlike dopamine itself, it can be taken orally and crosses the blood-brain barrier. It is rapidly taken up by dopaminergic neurons and converted to dopamine. It is used for the treatment of parkinsonism and is usually given with agents that inhibit its conversion to dopamine outside of the central nervous system. [NIH]

Ligation: Application of a ligature to tie a vessel or strangulate a part. [NIH]

Lumbar: Pertaining to the loins, the part of the back between the thorax and the pelvis. [EU]

Manifest: Being the part or aspect of a phenomenon that is directly observable : concretely expressed in behaviour. [EU]

Mental: Pertaining to the mind; psychic. 2. (L. mentum chin) pertaining to the chin. [EU]

Modulator: A specific inductor that brings out characteristics peculiar to a definite region. [EU]

Molecular: Of, pertaining to, or composed of molecules : a very small mass of matter. [EU]

Monotherapy: A therapy which uses only one drug. [EU]

Nephrotic: Pertaining to, resembling, or caused by nephrosis. [EU]

Neural: 1. pertaining to a nerve or to the nerves. 2. situated in the region of the spinal axis, as the neutral arch. [EU]

Neuronal: Pertaining to a neuron or neurons (= conducting cells of the nervous system). [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neuropathy: A general term denoting functional disturbances and/or pathological changes in the peripheral nervous system. The etiology may be known e.g. arsenical n., diabetic n., ischemic n., traumatic n.) or unknown. Encephalopathy and myelopathy are corresponding terms relating to involvement of the brain and spinal cord, respectively. The term is also used to designate noninflammatory lesions in the peripheral nervous system, in contrast to inflammatory lesions (neuritis). [EU]

Niacin: Water-soluble vitamin of the B complex occurring in various animal and plant tissues. Required by the body for the formation of coenzymes NAD and NADP. Has pellagra-curative, vasodilating, and antilipemic properties. [NIH]

Nicotine: Nicotine is highly toxic alkaloid. It is the prototypical agonist at nicotinic cholinergic receptors where it dramatically stimulates neurons and ultimately blocks synaptic transmission. Nicotine is also important medically because of its presence in tobacco smoke. [NIH]

Orthopaedic: Pertaining to the correction of deformities of the musculoskeletal system; pertaining to orthopaedics. [EU]

Overdose: 1. to administer an excessive dose. 2. an excessive dose. [EU]

Overweight: An excess of body weight but not necessarily body fat; a body mass index of 25 to 29.9 kg/m². [NIH]

Pelvic: Pertaining to the pelvis. [EU]

Pergolide: A long-acting dopamine agonist which is effective in the treatment of Parkinson's disease and hyperprolactinemia. It has also been observed to have antihypertensive effects. [NIH]

Phenotype: The entire physical, biochemical, and physiological makeup of an individual as determined by his or her genes and by the environment in the broad sense. [NIH]

Posterior: Situated in back of, or in the back part of, or affecting the back or dorsal surface of the body. In lower animals, it refers to the caudal end of the body. [EU]

Potassium: An element that is in the alkali group of metals. It has an atomic symbol K, atomic number 19, and atomic weight 39.10. It is the chief cation in the intracellular fluid of muscle and other cells. Potassium ion is a strong electrolyte and it plays a significant role in the regulation of fluid volume and maintenance of the water-electrolyte balance. [NIH]

Prevalence: The number of events, e.g., instances of a given disease or other condition, in a given population at a designated time. When used without qualification, the term usually refers to the situation at specific point in time (point prevalence). Prevalence is a number, not a rate. [NIH]

Prosthesis: An artificial substitute for a missing body part, such as an arm or leg, eye or tooth, used for functional or cosmetic reasons, or both. [EU]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [NIH]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Psychiatry: The medical science that deals with the origin, diagnosis, prevention, and treatment of mental disorders. [NIH]

Pulmonary: Relating to the lungs. [NIH]

Receptor: 1. a molecular structure within a cell or on the surface characterized by (1) selective binding of a specific substance and (2) a

specific physiologic effect that accompanies the binding, e.g., cell-surface receptors for peptide hormones, neurotransmitters, antigens, complement fragments, and immunoglobulins and cytoplasmic receptors for steroid hormones. 2. a sensory nerve terminal that responds to stimuli of various kinds. [EU]

Relaxant: 1. lessening or reducing tension. 2. an agent that lessens tension. [EU]

Resuscitation: The restoration to life or consciousness of one apparently dead; it includes such measures as artificial respiration and cardiac massage. [EU]

Rheumatoid: Resembling rheumatism. [EU]

Riboflavin: Nutritional factor found in milk, eggs, malted barley, liver, kidney, heart, and leafy vegetables. The richest natural source is yeast. It occurs in the free form only in the retina of the eye, in whey, and in urine; its principal forms in tissues and cells are as FMN and FAD. [NIH]

Sarcoma: A tumour made up of a substance like the embryonic connective tissue; tissue composed of closely packed cells embedded in a fibrillar or homogeneous substance. Sarcomas are often highly malignant. [EU]

Selenium: An element with the atomic symbol Se, atomic number 34, and atomic weight 78.96. It is an essential micronutrient for mammals and other animals but is toxic in large amounts. Selenium protects intracellular structures against oxidative damage. It is an essential component of glutathione peroxidase. [NIH]

Skeletal: Pertaining to the skeleton. [EU]

Stimulant: 1. producing stimulation; especially producing stimulation by causing tension on muscle fibre through the nervous tissue. 2. an agent or remedy that produces stimulation. [EU]

Stroke: Sudden loss of function of part of the brain because of loss of blood flow. Stroke may be caused by a clot (thrombosis) or rupture (hemorrhage) of a blood vessel to the brain. [NIH]

Surgical: Of, pertaining to, or correctable by surgery. [EU]

Thermoregulation: Heat regulation. [EU]

Thoracic: Pertaining to or affecting the chest. [EU]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

Transcutaneous: Transdermal. [EU]

Ulcer: A local defect, or excavation, of the surface of an organ or tissue; which is produced by the sloughing of inflammatory necrotic tissue. [EU]

Vein: Vessel-carrying blood from various parts of the body to the heart. [NIH]

Venous: Of or pertaining to the veins. [EU]

Wakefulness: A state in which there is an enhanced potential for sensitivity and an efficient responsiveness to external stimuli. [NIH]

General Dictionaries and Glossaries

While the above glossary is essentially complete, the dictionaries listed here cover virtually all aspects of medicine, from basic words and phrases to more advanced terms (sorted alphabetically by title; hyperlinks provide rankings, information and reviews at Amazon.com):

- **Dictionary of Medical Acronyms & Abbreviations** by Stanley Jablonski (Editor), Paperback, 4th edition (2001), Lippincott Williams & Wilkins Publishers, ISBN: 1560534605,
<http://www.amazon.com/exec/obidos/ASIN/1560534605/icongroupinterna>
- **Dictionary of Medical Terms : For the Nonmedical Person (Dictionary of Medical Terms for the Nonmedical Person, Ed 4)** by Mikel A. Rothenberg, M.D, et al, Paperback - 544 pages, 4th edition (2000), Barrons Educational Series, ISBN: 0764112015,
<http://www.amazon.com/exec/obidos/ASIN/0764112015/icongroupinterna>
- **A Dictionary of the History of Medicine** by A. Sebastian, CD-Rom edition (2001), CRC Press-Parthenon Publishers, ISBN: 185070368X,
<http://www.amazon.com/exec/obidos/ASIN/185070368X/icongroupinterna>
- **Dorland's Illustrated Medical Dictionary (Standard Version)** by Dorland, et al, Hardcover - 2088 pages, 29th edition (2000), W B Saunders Co, ISBN: 0721662544,
<http://www.amazon.com/exec/obidos/ASIN/0721662544/icongroupinterna>
- **Dorland's Electronic Medical Dictionary** by Dorland, et al, Software, 29th Book & CD-Rom edition (2000), Harcourt Health Sciences, ISBN: 0721694934,
<http://www.amazon.com/exec/obidos/ASIN/0721694934/icongroupinterna>
- **Dorland's Pocket Medical Dictionary (Dorland's Pocket Medical Dictionary, 26th Ed)** Hardcover - 912 pages, 26th edition (2001), W B Saunders Co, ISBN: 0721682812,
<http://www.amazon.com/exec/obidos/ASIN/0721682812/icongroupinterna/103-4193558-7304618>
- **Melloni's Illustrated Medical Dictionary (Melloni's Illustrated Medical Dictionary, 4th Ed)** by Melloni, Hardcover, 4th edition (2001), CRC Press-Parthenon Publishers, ISBN: 85070094X,
<http://www.amazon.com/exec/obidos/ASIN/85070094X/icongroupinterna>

- **Stedman's Electronic Medical Dictionary Version 5.0 (CD-ROM for Windows and Macintosh, Individual)** by Stedmans, CD-ROM edition (2000), Lippincott Williams & Wilkins Publishers, ISBN: 0781726328, <http://www.amazon.com/exec/obidos/ASIN/0781726328/icongroupinterna>
- **Stedman's Medical Dictionary** by Thomas Lathrop Stedman, Hardcover - 2098 pages, 27th edition (2000), Lippincott, Williams & Wilkins, ISBN: 068340007X, <http://www.amazon.com/exec/obidos/ASIN/068340007X/icongroupinterna>
- **Tabers Cyclopedic Medical Dictionary (Thumb Index)** by Donald Venes (Editor), et al, Hardcover - 2439 pages, 19th edition (2001), F A Davis Co, ISBN: 0803606540, <http://www.amazon.com/exec/obidos/ASIN/0803606540/icongroupinterna>

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