

First Aid

Establish Calm and Control

When an emergency happens, having a step-by-step approach to the problems facing you can help you think clearly and care for the most important problems first.

1. Take a deep breath. Emergencies can be scary. But the calmer you are, the more useful you will be. Being calm will also comfort and help the injured person or people around you.
2. Ask yourself: is this place safe? Move the person and yourself away from fires, busy streets, or other dangers. (If the person might have a neck or back injury, move him carefully so you do not move his neck. See pages 22 to 23.)
3. Treat the most dangerous problems first. No matter what caused the injury, **check breathing immediately**. It is the most important function needed for life. Check if the airway is blocked (page 5) and if the person needs rescue breathing (page 7)..
4. After breathing, **check for bleeding**. Heavy bleeding can kill. See page 9.

Protect yourself

Try to keep blood and body fluids off yourself when caring for people who are bleeding. Avoid touching with bare hands anything soiled by blood.

- **Wash your hands often.** Also flush out any blood that gets in your eyes or into a cut in your skin to help prevent you from getting an infection.
- **Cover your skin and eyes.** Wear glasses and clean gloves if you can. Plastic bags worn on your hands work too.



5. When the person is breathing and heavy bleeding is controlled, check the whole body for other injuries and broken bones. Start at the head and check every part of the body, front and back, down to the toes. Gently ask questions, look the person over, and carefully touch the body to see if there are hidden injuries that may be hard to see at first. It is common to have more than one injury.
6. Try to be as gentle and comforting as you can. Injured people are often scared and in pain. When a person calms down, this helps their fast-beating heart and fast breathing return to normal.

Check breathing often and make sure bleeding is under control. Also check blood pressure, if you can. An injured person may seem fine at first and then suddenly get worse. Regularly re check these important signs until you are sure the person is OK. Keep talking to an injured person. This will help you see if they are confused or if their confusion gets worse.



The people who gather after an accident should be encouraged to help. Ask loud, assertive people to clear a space around you and the injured person. Tell someone to go for medical help and someone else to get supplies like cloth (for bandages), or blankets. Giving out tasks will keep people calm and help the urgent tasks get done.

The injured person can also help herself. People can put pressure on their own wounds to stop bleeding (see page 9). This can focus the person and allows you to check for other injuries or to care for other injured people.

When someone needs help:

? Ask if the person has pain, numbness, or difficulty moving.

→ These are signs of sprains, broken ribs (page 26), or broken bones (page 29). If there is numbness or difficulty moving the lower body or the whole body, there may be a spine injury (page 22).

Ask or notice if they are having trouble breathing.

→ Stabbing pain with breathing may be a broken rib (see page 26).

Notice if they seem confused or have trouble speaking clearly. This can help you to assess how badly injured they are. See what to do if the person is unconscious (page 4).

→ The person may be choking if he cannot cough or talk (page 5).

→ Shortness of breath and wheezing are signs of asthma. Trouble breathing can also be caused by chemical poisoning or drug overdose (pages 46 to 48).

→ Many people become confused after an accident. But unclear speech, losing consciousness, and lasting confusion can be signs of head injury (pages 23 to 25) or intoxication from drugs or alcohol (page 48).

→ Slurred speech can also be a sign of stroke. Is one side of their face or body drooping or weak? Hospital treatment within a few hours is needed.

→ Confusion or changes in consciousness can be a sign of a diabetic emergency (page 49).

? Look carefully: Is there bleeding, swelling, bruises, redness, or disfigured body parts? Compare one side of the body to the other. For example, if one leg looks shorter, it may be broken.

→ See what to do for bleeding (pages 9 to 11).

→ See information on broken ribs (page 26) and broken bones (page 29).

→ Bruising, swelling, and redness can be signs of bleeding inside the body. Watch for shock (page 12).

? Feel gently along the head, face, neck, back, front, arms, and legs. Is there pain, numbness, or bones out of place? If there may be a back or neck injury, feel every vertebra (the knobs of the backbone) from the head to the space between the buttocks.

→ See what to do for signs of head injury (pages 23 to 25).

→ See what to do if you suspect there may be an injury to the head, neck, or back before you move the person (pages 22 to 23).

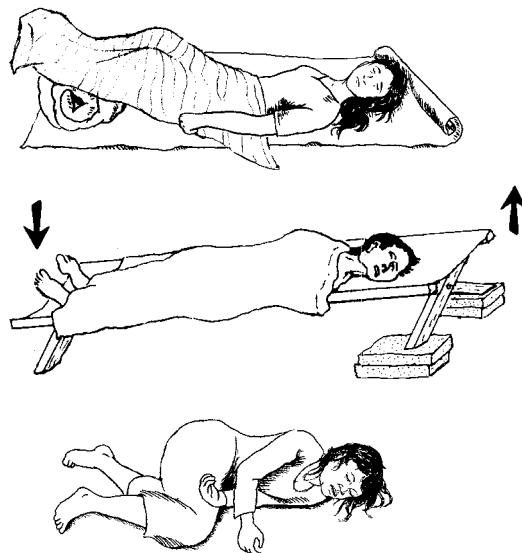
Loss of Consciousness

Common causes of loss of consciousness are:

- shock (page 12)
- hit on the head (page 23)
- heart attack (page 28)
- stroke
- poisoning (page 45)
- blood sugar too low (page 49)
- seizures (page 51)
- heat stroke (page 57)
- too much alcohol, drugs or medicine (page 48)

If a person is unconscious and you do not know why, immediately check each of the following:

1. Is he breathing well? If not, tilt his head way back and pull the jaw and tongue forward. If something is stuck in his throat, pull it out. If he is not breathing, use rescue breathing at once (see page 7).
2. If he might have a neck or back injury, do not move him because any change of position may cause greater injury. If you have to move him, do so with great care without bending his back or neck (see page 22)
3. Is he losing a lot of blood? If so, try to stop the bleeding (see page 9).
4. Is he in shock (moist, pale skin; weak, rapid pulse)? If so, lay him with his head lower than his feet and loosen his clothing (see page 12).
5. Could it be heat stroke (no sweat, high fever, hot, red skin)? If so, shade him from the sun, keep his head higher than his feet, and soak him with cold water (ice water if possible) and fan him (see page 57).
6. If he is breathing and you are sure there are no back or neck injuries, the person can be rolled to the side to prevent choking if he vomits.



*Never give anything by mouth to a person
who is unconscious.*

Breathing

Choking

When food or something else gets stuck in the throat or airway and a person cannot breathe, this is choking.

If the person is coughing, let them continue coughing but if they cannot talk or cannot cough, you can save a life by helping quickly.

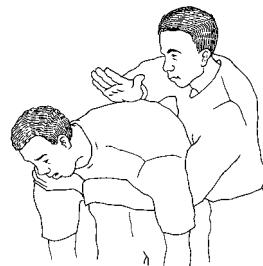


Learn how to help a baby that is choking, see page 6.

Give back blows

Bend him over at the waist, and give 5 firm blows on the middle of the back, between the shoulder blades. Use the palm of your hand.

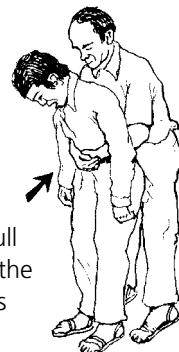
If this does not work:



Give abdominal thrusts

Stand behind the person and wrap your arms around his waist.

Put your fist against his belly, just above the navel and below the ribs.



Cover your fist with your other hand and use both hands to pull up and in with a sudden, strong jerk. Use enough force to lift the person off his feet. (Use less force on a small child.) Repeat this 5 times in a row.

If there is something blocking air from getting to the lungs or throat, the force of air being pushed so hard should drive it out.

For a pregnant woman or someone who is very fat, put your arms around the middle chest (put your fist between the breasts). Then thrust straight in.

If the person is choking and becomes unconscious

Carefully lay him on his back and look in the mouth. If you can see food or something else blocking the throat, sweep it out with a hooked finger. But do not dig into the throat as this may drive the object in further. Then give rescue breathing (see page 7).

For a baby younger than one year

If a baby is choking and cannot cry or cough, try to clear her throat with back blows and chest thrusts.

Position the baby

Hold the baby face down with her head lower than her body.



Give back blows

Use the heel of your hand to give 5 firm blows between the shoulder blades.

If the baby does not start breathing, turn her over.



Give chest thrusts

Put 2 or 3 fingers in the center of the chest – just below the nipples.

Use a firm, quick movement to push the chest down about 2 centimeters. Do this 5 times or until the baby breathes.

If you cannot clear the airway for a baby, child, or adult, give rescue breathing (page 7).

Drowning

Get the person out of the water as fast as you can and immediately start rescue breathing (page 7) and chest compressions (page 8). Give the rescue breaths first to get some air into the person's body.

If the person vomits, turn him on his side and gently use your finger or a cloth to wipe the vomit away so he does not choke on it.

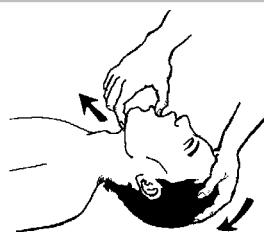
Rescue breathing

People can only live about 4 minutes without breathing. You may be able to save someone's life with rescue breaths if he stopped breathing because he choked, was hit on the head, almost drowned, was electrocuted, overdosed on drugs, or has hypothermia (extreme cold).

If a person stops breathing, you can save his life by giving rescue breathing immediately.

Position his head

Lay the person face up. Lift the chin and push on the forehead to tilt the head back so his nose is pointing straight up.



Give rescue breaths

Pinch his nose closed so air does not escape that way.

Cover his mouth completely with yours.

Give 2 strong, slow breaths.

The chest should rise with each breath. If it does not, the air is not getting into the lungs. Reposition the head slightly and try again. Let the person breathe out after each breath.



Check for a pulse

After 2 breaths, check if he is breathing.

Feel for a pulse on either side of the neck, or listen to the chest, right over the heart.

If there is no pulse, see "No Heartbeat" (page 8).

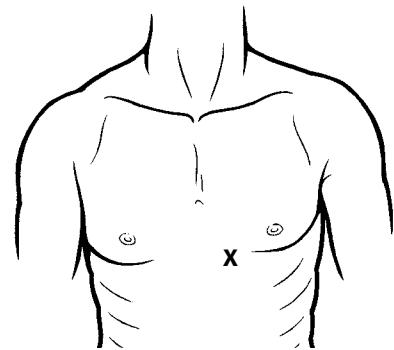
If you do feel or hear a pulse, keep giving breaths until he breathes on his own. It may take 30 minutes or more.



No Heartbeat

Check for a pulse (heartbeat) on the neck (see page 7). Or listen by putting your ear on the left side of the chest (where the drawing shows an X).

If there is no heartbeat, try to restart it with chest compressions. It is important to start chest compressions quickly, so if you are not sure if you have found a heartbeat, or if the heartbeat is very faint, it is safest to do chest compressions.



Give chest compressions

Push hard and fast on the center of the chest 30 times. Push straight down, about 5 cm (2 in). Try for a fast rate, at least 100 times a minute, but the exact rate is not important. Push hard and fast!



Give rescue breaths

After 30 chest compressions, give 2 rescue breaths that make the chest rise (page 7).

Continue with compressions and breaths

Keep alternating between 30 chest compressions and 2 rescue breaths. You may have to do this for a long time. Continue until the person is breathing and alert, or until there is no doubt he is dead.

Get help

If you can get the person to a hospital quickly, do so. Keep giving chest compressions and rescue breathing on the way. This will help to keep the body functions going until you can get help.

This may bring life back to someone after electrocution, drowning, if he suffered a very hard blow to the chest, hypothermia (too cold), or drug overdose. Chest compressions are less likely to help someone after a heart attack, but are worth trying, especially if you can get more medical help. (See more about heart attacks, page 28.)

A medical device called a defibrillator gives an electric shock to re-start the heart after a heart attack. Find out before emergencies happen if there are defibrillators in your community and where they are kept. They are sometimes found in ambulances, or in public places like a police station or a large hotel.

Bleeding

Direct pressure

Direct, firm pressure will stop almost all bleeding, even large, heavily bleeding wounds. If the person is bleeding from the head, apply pressure and see page 25.

1. Raise the injured part so it is above the level of the person's heart.
2. Grab the cleanest piece of cloth you can find nearby, fold it to about the size of the wound, and press it directly and firmly on the wound. Show the injured person how to put pressure on himself, if he is able. If the wound is large, put the gauze or cloth into the wound. Keep pressing until the bleeding stops. Do not remove the cloth if it becomes soaked with blood. Instead, add another cloth on top. For a large wound, do not lift your hand off until at least 15 minutes has passed, even to check if it has stopped bleeding.



When bleeding has slowed or stopped, you may be able to wrap a dressing firmly around the bleeding part. Put a folded gauze or cloth in or on top of the wound and then firmly wrap a bandage around it. Be sure the bandage is firm enough to create pressure on the wound, but not so tight that it cuts off the blood flow to the rest of the arm or leg.

Applying pressure to stop bleeding is hard work. Do not give up!

Never use dirt, kerosene, lime, or used coffee grounds to stop bleeding.

Blood can make a big mess and look like the person lost more than he did. But watch the person closely for these signs of losing too much blood:

DANGER SIGNS

- Confusion or losing consciousness
- Very fast heart rate
- Cold, moist, pale skin

If you see these signs, raise both the person's feet onto something so they are above the heart, and get help for shock (page 12).

Even if you do not see these signs, stay with the person or check in on him every 10 to 15 minutes to make sure he is OK and reassure him. Keep checking until he is acting and feeling normal.

Tourniquets

Use a tourniquet **only as a last resort**, when you are willing to risk the loss of an arm or leg in order to save a person's life.

Use tourniquets only when:

- **A limb is cut off** or is so mangled that it clearly cannot be saved.
- **Heavy bleeding that does not slow down from an arm or leg** with direct pressure. (Have you tried pressing harder first?)
- **There is a large, deep wound in the thigh**, like when a bullet, shrapnel, or something else has penetrated deep into the muscle, and the person is showing signs of blood loss like weakness, confusion, or pale skin. (It can be impossible to use enough pressure on a large thigh to stop heavy bleeding.)

Use a wide belt, a piece of cloth folded into a flat strip, or a blood pressure cuff inflated all the way to tie off the bleeding part. Do not use thin string or wire. It will cut right through the skin.

Get to a hospital as fast as you can. You have 2 or 3 hours before the limb is likely to be lost.

Step 1:

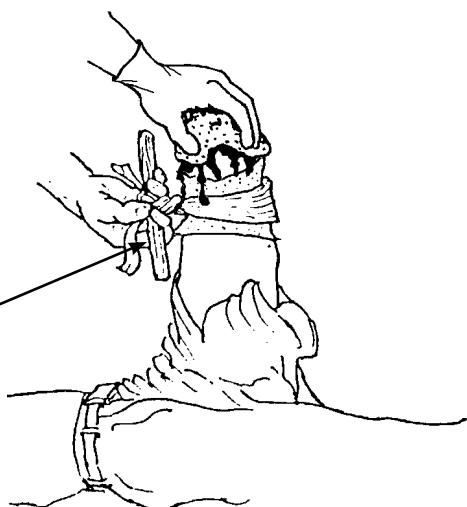
Place the tourniquet **above but close** to the wound, between the wound and the body. (A common mistake is putting the tourniquet too far from the wound.)

Step 2:

Wrap the tourniquet tightly around the limb twice.
Then tie a knot.

Step 3:

Put a short, strong stick on top of the knot.
Tie two more knots on top of the stick.



Step 4:

Twist the stick to tighten the tourniquet until bleeding stops.

Step 5:

Tie the stick in place with another cloth.

Shock

Shock is a life-threatening condition that can result from severe bleeding, dehydration, major wounds and burns, allergic reaction, or infection in the blood (sepsis). This kind of shock is different from “shock” from a surprise or scare. The body starts to shut down, losing the ability to perform its most basic functions. Once signs of shock begin, it tends to get worse very fast. Treat shock quickly to save the person’s life.



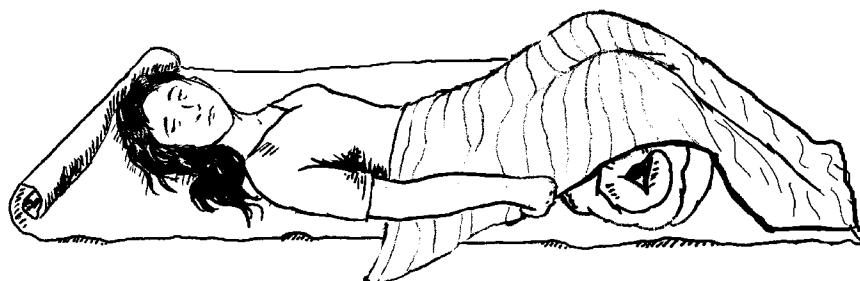
SIGNS

- Fear or restlessness, then confusion, weakness, and loss of consciousness
- Cold sweat: pale, cool, damp skin
- Weak, fast pulse
- Dropping blood pressure

TREATMENT

Get help. On the way:

- Treat the cause of the shock as quickly as you can:
 - » For bleeding, use pressure (page 9).
 - » For dehydration, the person will need fluids by IV if she cannot sit up and swallow liquids.
 - » If the cause of shock is sepsis (an infection that has spread to the bloodstream), antibiotics are needed immediately (see page 20).
- Keep the person warm (or remove some clothes if the person is hot).
- Raise the legs, supporting the knees.
- Keep calm and reassure the person.



Wounds

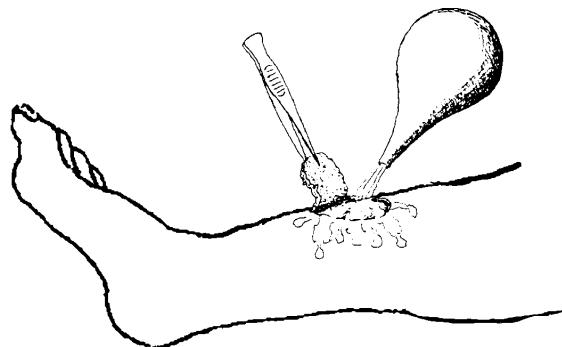
1. Stop the bleeding with pressure (page 9).
2. Clean the wound thoroughly as soon as you can. The better you clean it, the less likely it is to become infected. For larger wounds, give some kind of pain medicine before you clean and care for the wound. Inject lidocaine (see page 86) around the wound and just below the skin inside it. Or give another pain medicine and allow time for it to work.
3. Dress or close the wound, or for a small wound, leave it open to heal.

Clean all wounds

Any wound, big or small, can become infected. Clean every wound well.

Wash your hands well with soap. Then wash the wound with 1 to 4 liters of flowing water. You do not need antiseptics, some of which can slow healing down. If the wound looks dirty, use soapy water and then rinse that off with plain water.

Lift up any flaps of skin to clean underneath. For deep wounds, squirt the inside of the wound with a bulb syringe, letting the water run out.



Or take the needle off a syringe and squirt water into the wound.

Or just run lots of clean water over and into the wound.

Wash out anything left inside the wound, especially dirt, wood, or other rough material. You may need to use a piece of sterile gauze or clean fabric to clean out the wound, then rinse thoroughly.

Caring for wounds

As the wound heals, make sure it stays clean to prevent infection. If it gets dirty, clean the wound with lots of water. Covering the wound with a bandage, sterile gauze, washed banana leaf, or very clean piece of cloth will help keep it clean. Putting honey on the wound also helps prevent infection. Change the bandage daily, and if it becomes wet or dirty. It is better to have no bandage than one that is dirty or wet.

Watch for signs of infection such as increasing redness, pain, heat, swelling, bad smell or pus at the site of the wound. For any of these signs, clean the wound well. You may need to gently pull open the wound to clean it. Watch that the infection does not spread to other parts of the body (see page 19).

Closing wounds

A small wound is best left alone to heal. It should not need stitches. The most important thing is to keep wounds clean.

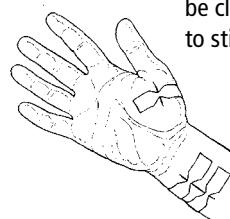
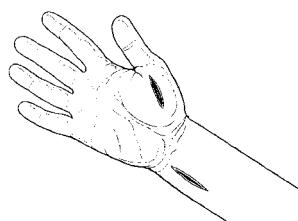
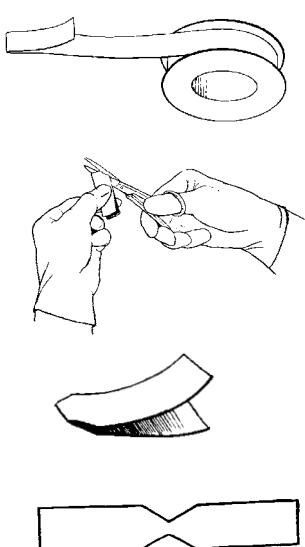
A wound that is more than 12 hours old should be cleaned and left open to heal.

A larger wound that comes together well will heal better if it is closed.

To close a shallow, clean wound, use butterfly bandages, glue, or stitches.

Butterfly bandage

Use a butterfly bandage for a small cut.



The skin around the wound must be clean and dry for the bandage to stick.

Glue

Super Glue or *Krazy Glue* (cyanoacrylate, a powerful adhesive) is easier to use than suture and works just as well for most wounds. Use it when you can clearly see how the two sides of the wound should go together. It may not work as well on hands or joints because they move so much. Do not use glue near the eyes or mouth. *Super Glue* may irritate the skin.

Step 1:

Make sure the wound is clean and the skin around it is dry.



Step 2:

Push the sides of the wound together. Keep fingers well away from the wound so they do not stick to the glue. A helper can use a couple of clean sticks to hold the sides together.

Step 3:

Squeeze a line of glue along the closed edges of the wound.

Step 4:

Hold the wound closed for 30 seconds. Then add another layer of glue. Wait another 30 seconds or so, and then add a third layer. Each layer should cover a little more of the surrounding skin than the last.

The glue will wear away on its own. By then the wound should be healed.

Stitches (sutures)

A cut will benefit from stitches if it is shallow and long, or if the edges of the skin around the cut do not come together by themselves.

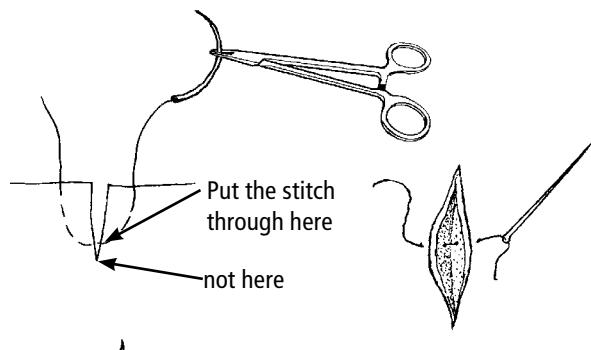
Line up the edges. The edges of the wound should come up slightly above the skin instead of tucking into the wound.

Make the depth and the length of the stitch the same on each side of the wound.

Step 1:

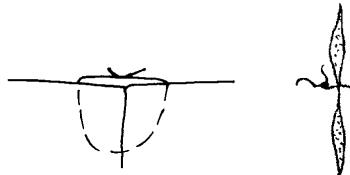
Put the stitch through the cut, not under the cut.

If you do not have suture or a curved suturing needle, sharpen a sewing needle. Boil the needle, some silk or nylon thread, and a small pair of pliers for pulling the needle through tough skin.



Step 2:

Tie a secure knot.



Step 3:

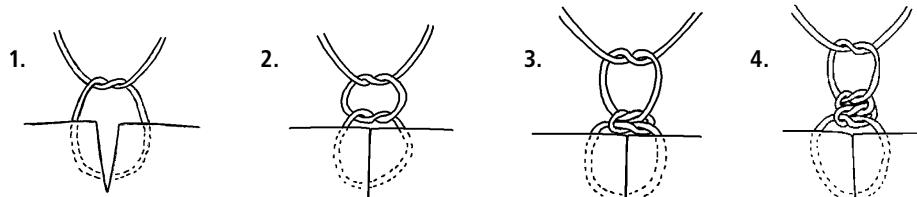
Make enough stitches to close the whole cut.

A deep wound should get a couple of stitches inside the muscle with dissolvable suture before sewing the skin together. If you cannot do this then do not close the wound.



Leave stitches in place for about one week (10 days for a leg or joint wound). Then cut each stitch and pull it out. If you spend some time sewing clothes, you will find that your skill to suture wounds improves as well.

How to tie a strong knot:



Deep Wounds

Deep wounds should generally be left open to heal. Wounds that are not closed properly can easily become infected. Rough, messy wounds and puncture wounds in particular should be cleaned twice a day with boiled water and kept open, or re-opened, so they will heal from the inside.

Deep wounds can develop a tetanus infection, see page 21. Unless the person had a tetanus vaccination within the last 5 years, they will need one now and also an injection of antitetanus immunoglobulin (see pages 74 to 75).

If you are not sure whether closing a wound is a good idea, it probably is not.

Never close animal bites, puncture wounds, or rough, messy wounds.

Animal bites

Clean animal bites very well with soap and water for 15 minutes or more. Animal bites are likely to get infected, so give amoxicillin with clavulanic acid (page 64) or another combination of antibiotics for animal bites (page 76).

For monkey, bat and raccoon bites, get a rabies vaccination and immunoglobulin immediately, see page 76. Do the same for dog bites if the dog could have rabies.



Rabies is deadly. It affects the brain causing signs like confusion or paralysis. Then, in just a few days, the person becomes unconscious leading to death. Following a bite from an animal with rabies, it can take a month or a few months for signs to appear but by then it is too late to treat. If you think rabies is a possibility and do not have rabies vaccine or rabies immunoglobulin, contact your local health authority as soon as possible after the bite.

Even if there is no rabies immunoglobulin available, washing the skin thoroughly right away with soap and repeated rinsing, and giving the series of rabies vaccine as soon as possible can prevent rabies.

Knife wounds



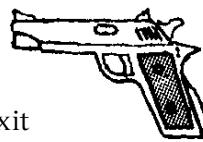
Deep knife wounds should usually be kept open and cleaned often. Give cloxacillin (page 65), clindamycin (page 69), or cephalexin (page 72) at any sign of infection.

Knife wounds to the chest or belly can be very dangerous. Get medical help. Know what to do on the way for a knife wound to the chest (page 26), or a knife wound to the belly (page 27).

Gunshot Wounds

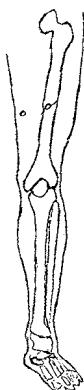
Get medical help as soon as possible for gunshot wounds.

Stop bleeding with direct pressure (page 9). Check both where the bullet entered and where it exited. If there is no exit wound, the bullet may have to be removed.

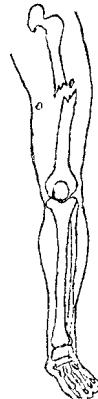


Gunshot wounds are likely to become infected. In all cases, wash the wound well and give one of these: cloxacillin, clindamycin, or cephalexin.

For a bullet in the head, on the way to get help, raise the head a little with folded blankets or pillows. Cover the wound with a clean bandage.



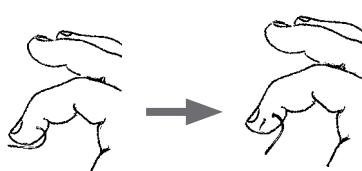
If there is any chance that the bullet hit a bone, the bone may be cracked or broken through. Splint the limb and do not use it for several weeks. See broken bones, pages 29 to 33.



Fish hooks

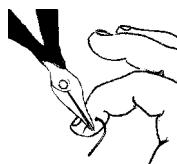
Step 1:

Push the hook through the skin so it pokes out the other side like this:



Step 2:

Cut off the barb or the shank.



Step 3:

Pull the rest of the hook out.



Infection

Any wound can become infected.

SIGNS OF INFECTION

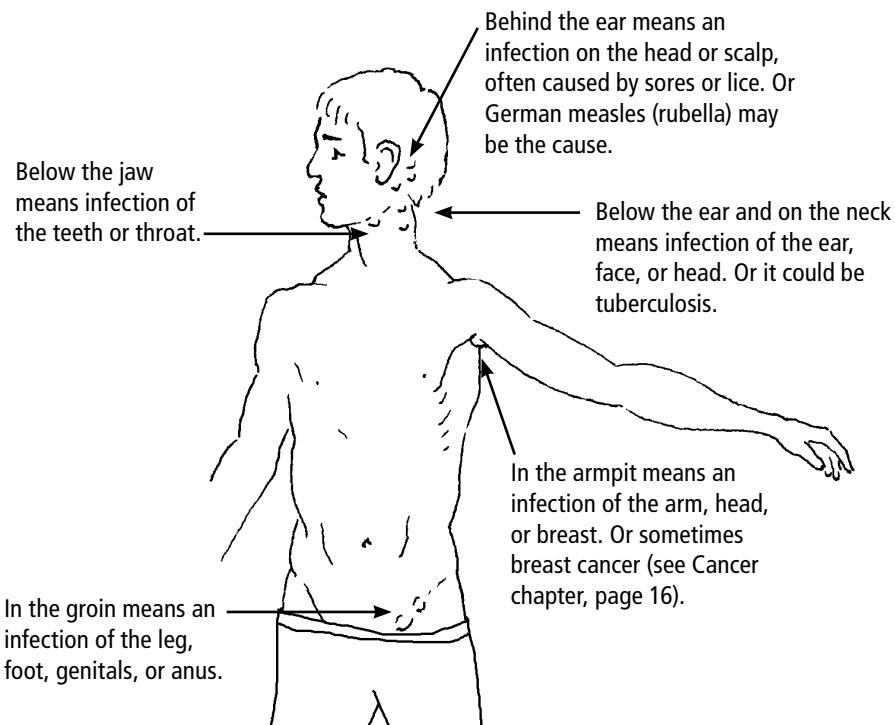
The wound is infected if it:

- becomes swollen, red, and hot
- has pus
- begins to smell bad

The infection is spreading to other parts of the body if:

- it causes fever
- the lymph nodes become swollen and tender

Lymph nodes—often called ‘glands’—are little traps for germs that form small lumps under the skin when they get infected. Swollen lymph nodes mean infection.



TREATMENT FOR INFECTION

Clean the wound well. You may need to open up an abscess or remove stitches. Unless the infected area is small, shows no signs of infection and is healing quickly, it is usually wise to give antibiotics. Give dicloxacillin (see page 66), cephalexin (see page 72), or clindamycin (see page 69). A person who is not up-to-date with tetanus vaccinations needs a vaccination and, if the wound is deep, also an injection of antitetanus immunoglobulin (see pages 74 to 75).

If the infection does not get better, it can spread through the blood. This is called sepsis.

Sepsis

Sepsis is when an infection spreads to the bloodstream. It is dangerous because it can lead to shock. If you suspect sepsis, get medical help quickly and treat the person on the way.

SIGNS OF SEPSIS

- Fever or too low temperature
- Fast heart rate—pulse is more than 90 beats per minute
- Fast breathing—more than 20 breaths per minute
- Difficulty breathing
- Splotchy or pale skin
- Less urine
- Confusion or losing consciousness
- Low blood pressure



The most important signs are fever or too low temperature, fast heart rate, and fast breathing. If the person has 2 or more of these signs, treat for sepsis.

TREATMENT

Get medical help. On the way:

- Watch for and treat any signs of shock (page 12)
- Give ceftriaxone (page 72), OR ciprofloxacin (page 71) plus clindamycin (page 69).
- Clean any infected wounds, remove dead skin, and if you know how, drain abscesses of pus.
- If the person is breathing well, give fluids to drink. Give small sips frequently.

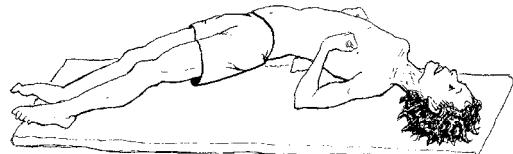
Tetanus (lockjaw)

Tetanus is a deadly infection that gets into a wound or the umbilical cord, and then spreads throughout the body.

SIGNS

- Tense and painful contractions of all the muscles.
- During contractions, breathing may stop.
- Extreme muscle spasms that come and go.
- Lockjaw (cannot open the mouth easily).
- Stiff neck and a stiff, board-hard belly.

Get medical help fast for these signs!



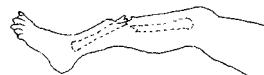
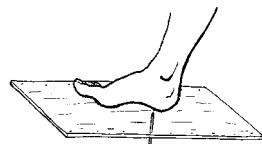
Signs of tetanus most often appear 7 to 10 days after an injury. But signs can also start as soon as 3 days after being infected or not appear until 2 or 3 weeks later.

PREVENTION

Tetanus is much easier to prevent than to treat. Prevent by vaccinating all children against tetanus and carefully cleaning wounds so they do not get infected. Children need 3 doses of the tetanus vaccine as infants and then 3 booster vaccines later (page 75). Pregnant women need a tetanus vaccination unless they have had one recently.

Wounds most likely to develop tetanus

- Puncture wounds.
- Gunshot wounds.
- Broken bones, when the bone pokes through the skin (open fractures).
- Severe burns or frostbite.
- Unsafe abortions and injections or piercings with used needles can also lead to tetanus.



Serious, deep or dirty wounds need special cleaning, care, and antibiotics (see pages 17 to 18). Unless the person had a tetanus vaccine within the past 5 years, they need one now and also an injection of antitetanus immunoglobulin (pages 74 and 75).

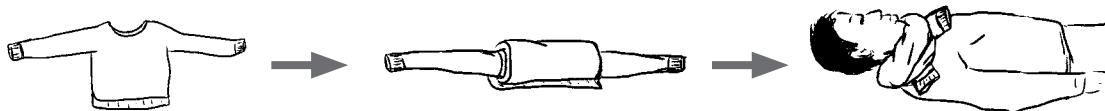
Newborn tetanus

Newborns can get infected with tetanus through the umbilical cord if the mother does not have up-to-date tetanus vaccinations (page 75). Cutting the cord with a sterile blade and keeping the cord clean protect babies from tetanus at birth.

Spine and Neck Injuries

Inside the bones of the spine is the spinal cord, an extension of the brain. An injury to the spinal cord can cause life-long disability or death. If there is any chance the person hurt his spine, you can protect him from further injury by **keeping his neck and back still!**

Assume that the spine may be injured after any car, motorcycle, or bicycle crash, any big fall, or blow to the back or head. Keep the neck and back still so they cannot turn side to side or up and down, which could further damage the spine. Tape a roll of clothes, fabric, foam, or something else around the neck to keep it from moving.



Do not give pain medicine until you are sure there is no injury to the spine. Pain reminds the person to keep still.

SIGNS OF SPINE INJURY

- Pain or tenderness along the neck or spine
- Weakness or loss of movement in the arms or legs
- Numbness in the arms or legs

Other signs of spine injury include loss of control of urine or stool, difficulty breathing, or shock (page 12). If there is any doubt, it is safest to treat the person as if he has a spine injury.

To check for spine injury, ask the person to stay flat on his back and to raise his knees. Then ask him to raise his arms. Can he move them? Does he feel pain? Touch the fingers and toes. Can he feel your touch? Can he feel your pinch?

If there is a place on the body below which the person cannot move or feel, the bones in the spine are broken. But with help from others, you can prevent his problems from getting worse.



If he still has feeling and movement, feel the spine itself. Carefully “log roll” him to his side like this to check his whole back.

Keep the head, neck, and back in one straight line as you roll. Then keep the body still, and gently feel each bump along the back bone, from the back of the head to between the buttocks. Feel for bones out of place, breaks, or pain.

Use the same group effort to carefully roll him back.

(If the person is vomiting, place something under his head so he can stay on his side.)

If there is pain or tenderness, the person needs x-rays to see if there are smaller breaks in the bones. He will need to rest in one position, being turned every few hours but keeping the neck and back still, until pain subsides in a week or so.

To move the person, log roll him onto his side and put a long flat board, like a wooden door, under him. Then roll him back onto the board. Use a few long strips of strong tape or cloth to secure his head, chest, and thighs to the board. If you must keep the person on this board for a long time, you should roll him to his side every couple of hours.

A person who has had an injury to the spine needs long-term physical therapy. Seek help from those with experience, or use a book like *Disabled Village Children* or *A Health Handbook for Women with Disabilities*, both available from Hesperian.



Head Injuries

If someone falls, gets hit in the head, or is in a vehicle accident, watch for signs of brain injury. It can be difficult to tell if there is brain injury if the person has been drinking or using drugs because many of these signs can be the same. Also check anyone with a head injury for neck or spine injuries (see page 22), as these two can go together.

SIGNS OF A MILD BRAIN INJURY OR CONCUSSION

- Confusion or loss of consciousness that gets better on its own in a short time
- Not remembering what happened
- Temporary blurry vision or “seeing stars”
- Nausea or vomiting that does not last long
- Headache, dizziness, or tiredness

Ask her to rest for about 24 hours and give paracetamol (acetaminophen) for the pain, but do not give ibuprofen or aspirin because they can worsen any bleeding inside the head. Watch the person for the first 24 hours. If she goes to sleep, wake her every few hours to see if she can still answer questions and think clearly. In the hours after the injury, if the person becomes more confused, gets a headache that gets worse and worse, or loses consciousness or has a seizure, there is likely bleeding inside the skull and immediate medical help is needed.

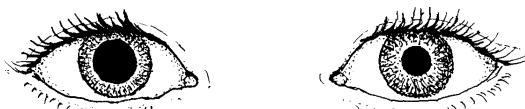
SIGNS OF SEVERE BRAIN INJURY

Get help for any of these signs:

- Unconsciousness
- Severe or worsening headache, changes in vision, loss of balance
- Nausea and vomiting
- Confusion, personality changes, aggression
- Very slow, very fast, or changing (irregular) heartbeat
- Fast, shallow breathing or breathing that is irregular (sometimes fast, sometimes slow)
- Warm, flushed skin
- Seizures
- Blood or clear fluid leaking from the ears or nose

These signs may happen hours after the injury:

- One pupil bigger than the other

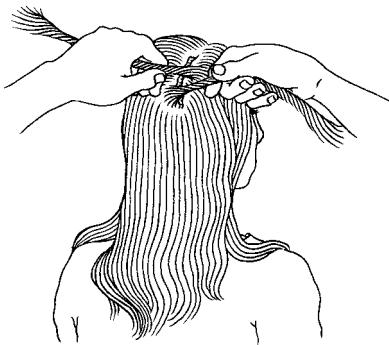


- Bruises around both eyes or behind the ear



Bleeding from the head

Head wounds bleed a lot. If you are sure the spine is not injured, ask the person to sit up, or prop her up, to decrease bleeding. Use pressure to stop the bleeding, then wash the wound well before closing it with sutures or glue. If you have no supplies you can tie the hair together across the wound, to help keep it closed, like this:



If the head is cut open, look for injury to the skull underneath. If you believe there may be an opening into the skull, apply pressure on each side of the wound and avoid pressing hard on the injured part of the head.

Nosebleeds

Pinch the nose firmly, just below the hard bony part.

Hold tight for 10 minutes—do not stop to check if the bleeding has stopped or the blood can start flowing again. If the nose still bleeds after 10 minutes, try pinching for another 10 minutes.

While most nosebleeds get better, any uncontrolled bleeding is dangerous. Beware especially of nose bleeds in old people.



PREVENTION

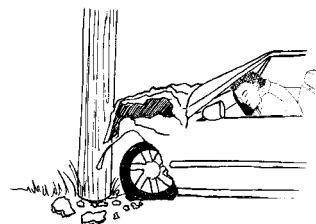
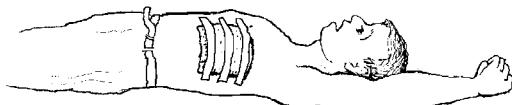
Rubbing a little petroleum jelly inside the nose might keep dryness from causing bleeding. Nose picking is a common cause of nosebleeds.

Chest Wounds and Broken Ribs

Tenderness to the touch, or stabbing pain with breathing or coughing after an injury to the chest may be a broken rib. Feel along the rib with your fingers. If there is a spot where it sticks up under the skin, or where it dips in and is very tender, it is broken. If only one rib is broken and it is not poking in or out of the body, give pain medicine. The person should avoid lifting and hard work for a few weeks. It will heal without any special treatment. Remind person to take deep breaths every few hours. This hurts, but keeps the lungs working.

Many broken ribs (flail chest)

1. Tape a thick pad, or folded piece of clothing over the broken ribs.



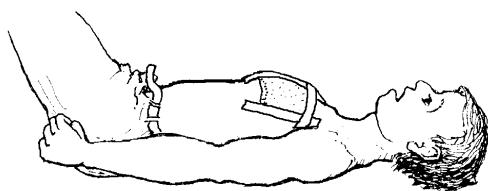
A fall or crushing injury can break many ribs at once.

2. Lay the person in whatever position best helps them breathe.
3. Watch for signs of shock (page 12) and get help.

Deep chest wounds

A gunshot, stab wound, explosion, or badly broken rib can cause air to leak in and out of the lungs.

1. Immediately cover the opening with anything airtight, like a bandage covered in petroleum jelly, a folded plastic bag, or a banana leaf.
2. Tape only 3 sides so air can get out but not in.



3. Lay the person in whatever position best helps them breathe. Get help.

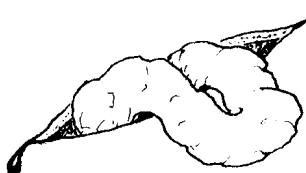
Abdomen Injuries and Wounds

If the belly has suffered a blow, such as from a hard fall, vehicle accident, or getting hit or kicked, look for bruises which are signs of bleeding trapped in the body. Too much bleeding inside the body can lead to shock. Also watch for these signs of serious injury to the abdomen:

DANGER SIGNS

- Severe pain
- Confusion
- Belly hard like a board, or growing larger
- Signs of blood loss: feeling faint, growing pale, fast pulse

For any of these danger signs, treat for shock (page 12) and get help. Do not give any food or drink. See page 8 in Belly Pain, Diarrhea, and Worms for more on emergencies of the abdomen.



If part of the gut spills out of the body, cover it with a clean cloth soaked in lightly salted water and get help. Do not push the guts back in.

An object sticking out of the body

For an object sticking out of the abdomen, it is usually safest to leave it in and get help. Even if help is days away, do not pull out the object. Secure it in place with bandages or fabric.



Heart Attack

Both men and women have heart attacks. Heart attack happens when blood flow to the heart is blocked for a long enough time that part of the heart muscle begins to die. This is usually caused by heart disease. For more on heart disease, see the chapter Heart Disease and High Blood Pressure.

SIGNS

- Pressure, squeezing, tightness, burning, pain, or a full feeling in the chest
- The pain may spread to the neck, shoulder, arms, teeth, or jaw
- The pain usually comes on gradually, but sometimes can be sudden and intense
- Shortness of breath
- Sweating
- Nausea
- Feeling lightheaded

Chest pain is the most common sign for both men and women, **but women more often do not feel chest pain.** Instead they feel shortness of breath, tiredness, nausea, vomiting, or back or jaw pain.



TREATMENT

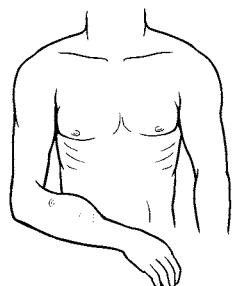
Give 1 tablet of aspirin right away (300 to 325 mg). Ask the person to chew it up and swallow it with water. Even if you are not sure the person is having a heart attack, aspirin will do no harm.

If you have it, give nitroglycerin dissolved under the tongue (see page 80). Morphine helps with the pain and fear (see page 87). Reassure the person and get help.

Broken Bones, Dislocations, and Sprains

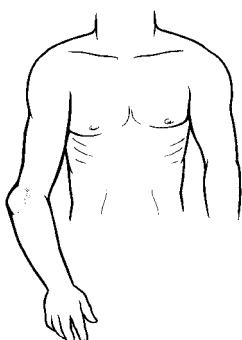
First decide if the bone is broken or dislocated (out of joint), or if there is a sprain to ligaments that connect the bones. It can be very hard to tell these injuries apart, and an x-ray may be necessary to know for sure. If you cannot tell if it is broken, dislocated or sprained, keep the body part still and get help. It is also possible to have a combination of these injuries.

Give paracetemol (acetaminophen) or ibuprofen to help with the pain.



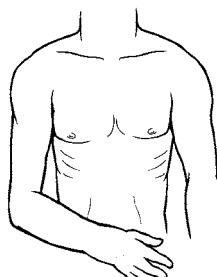
Broken

Mis-shapen in the middle of a bone or pain at one specific point on the bone, and little or no pain when it is kept still. Sometimes a bone could be broken even without being mis-shapen. An x-ray can tell you for sure if there is a break.



Dislocated

Deformed at a joint or unable to move a joint.



Sprain or Strain

Swelling and pain near a joint.

Broken bones

Keep a broken bone still until someone with experience setting bones can set it and put on a cast. To help keep it still, make a splint from a folded piece of cardboard, a flat piece of board, the stiff spine of a palm frond, or something else straight and hard.

Make a splint

Step 1:

Position the arm in its natural, resting position. The elbow should be bent.



Step 3:

Rest the arm on the splint. Place a roll of fabric inside the hand. For legs, splint along the side.



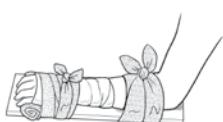
Step 2:

Wrap a layer of bandage, gauze, or thin cloth or use a shirt sleeve.

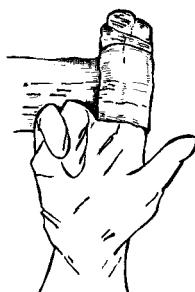
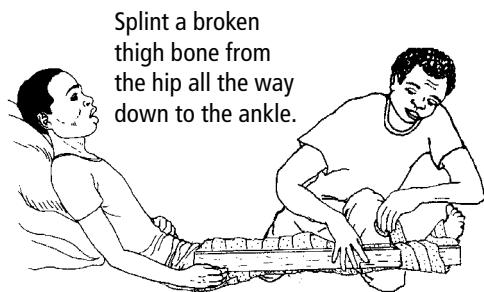


Step 4:

Wrap around the splint with a bandage or strip of fabric to hold it in place.

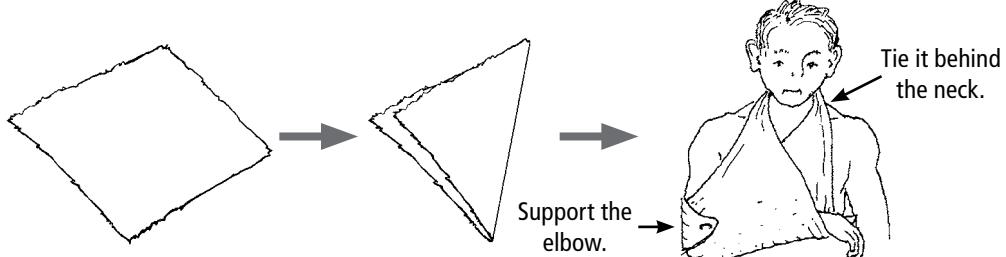


Leave fingers and toes uncovered and check often that they are warm and have normal feeling.



Make a sling

You can use a sling to protect and support a wounded arm or shoulder.



Set a bone

If the bone is out of its natural position, setting it will help it heal. But if you do not know how to set a bone correctly, you can cause a lot of damage by doing it wrong. Find an experienced bonesetter or community health worker who knows how to do this well.

Step 1:

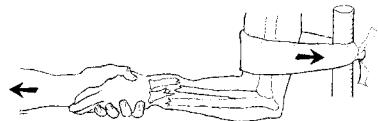
First give pain medicine (see page 84). You can also give an anti-anxiety medicine like lorazepam or diazepam to help the person stay calm (see pages 88 to 89).

Step 2:

Ask a helper to hold the part close to the body still or tie it to something that will not move.

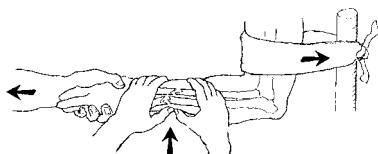
Step 3:

Pull the more distant part with a slow, steady, strong force. Do not yank, but pull hard enough to separate the bones.



Step 4:

When the pieces of bone are separated, gently line up the two edges and let them come back together.



Do not try to set a bone if the break seems to go into the joint or if there seems to be more than one break, leaving a “floating” piece of bone in the middle. Do not jerk or force the bones in place. This can cause permanent damage. Get help.

Make a cast

Casts can be made from pieces of cloth and a syrup or plaster mix that dries hard.

In Mexico several different plants such as tepeguaje (a tree of the bean family) and solda con solda (a huge, tree-climbing arum lily) are used to make casts. In India, traditional bone-setters make casts using a mixture of egg whites and herbs. The methods are similar. Any plant will do if a syrup can be made from it that will dry hard and firm and will not irritate the skin. Usually the plant is boiled in water until a thick syrup forms. Or use *Plaster of Paris* mixed with water.

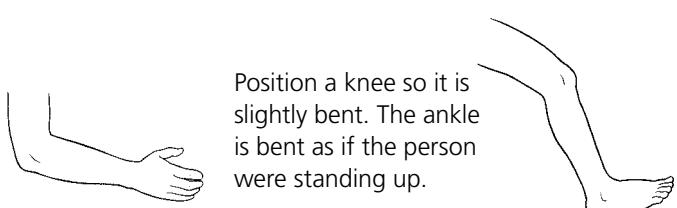
Wait until the swelling has gone down before casting. This can take up to a week. In the meantime, support the limb with a splint and sling.

Step 1:

Make sure the bones are aligned. Compare the injured side to the uninjured side to make sure both look and feel the same.

Step 2:

Position an injured elbow so it is bent, with the thumb up, and fingers slightly curved—as if holding a glass.



Position a knee so it is slightly bent. The ankle is bent as if the person were standing up.

Step 3:

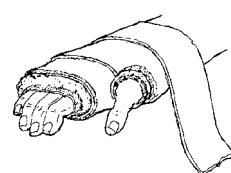
Wrap the area to be casted in a loose, thin layer of cloth or a few layers of gauze. Cast an area that includes the joint above and below the break.

Step 4:

Then wrap in soft cotton or kapok. Give extra padding to bony parts, but do not over-pad, especially around the broken part.

Step 5:

Dip strips of flannel, clean sheets, or bandages in the syrup or plaster mixture.



Step 6:

Form a cast all around the area with layers of bandage. Leave fingers and toes uncovered. Keep the cast snug but not tight.



Step 7:

Smooth the inner wrapping over the edge of the cast, like this:

After the cast is on, rest the limb and keep it elevated when possible. Use crutches to avoid putting any weight on a broken leg.

If, at any time after the cast is on, the fingers or toes start to swell, feel more pain, turn red, pale, or blue, or lose feeling, **remove the cast immediately**. Failing to cut off a cast that is too tight can cause the person to lose the limb.

How long does a broken bone take to heal? A young child heals in a few weeks. An old person's bones take months and may never heal properly

Keep a cast on the arm for at least a month. Leg casts should stay on for about 2 months.

To remove the cast, soak it in water and carefully cut it off. After the cast is removed, be gentle with the broken limb for the same amount of time as the cast was on. Slowly start normal activities, such as putting weight on an injured leg.

Bone broken through the skin (open fractures)

Open fractures are very likely to become infected. Give one of the following: ceftriaxone, cloxacillin, clindamycin, or cephalixin, and get help.

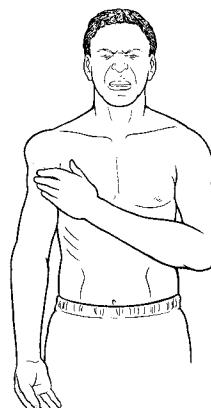


If you will be able to get to medical help within a few hours, wash your hands, and clean the wound very well with lots of flowing water for 5 minutes or more. Without putting the bone back under the skin, splint the limb.

If you know you cannot get to help within about 5 hours, clean the wound and bone ends without touching them. You may be able to help the bone go back to its position under the skin by pulling the limb in a straight line very gently (see Set a bone, page 31). Do not use force and do not continue if the person says it is hurting more. Then dress the wound lightly in sterile gauze. Change the gauze often to avoid infection until the person can be treated by an experienced health worker. If you need to move the person, make a splint first to keep the limb in the same position (page 31).

Dislocations (bone out of the joint)

Re-set a dislocated bone as soon as you can. The longer you wait, the more difficult and painful it will be to fix. If you cannot get the bone back in the joint, splint to hold still in the position that feels most comfortable, and get help.



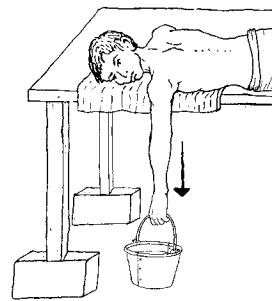
A person with experience may know how to pull the bone gently and slowly away from the joint, then let it “pop” back in correctly. Often when a bone comes out of the joint, pain and trauma make the muscles around it tighten which can prevent the bone from returning to the joint. Helping the person calm down and relax the muscles, and using an anti anxiety medicine such as diazepam, and a pain medicine such as ibuprofen, can make resetting a dislocation possible.

After resetting a dislocated joint, keep it still for 2 or 3 weeks with a brace or sling. Use a general pain medicine such as ibuprofen as needed. As soon as the pain has lessened enough to allow movement, take the joint out of the sling every few hours and gently flex or rotate it. For a shoulder, hang the arm down and let it move back and forth and in small circles. Be gentle with the joint for the following 2 or 3 months. Dislocations take a long time to heal.

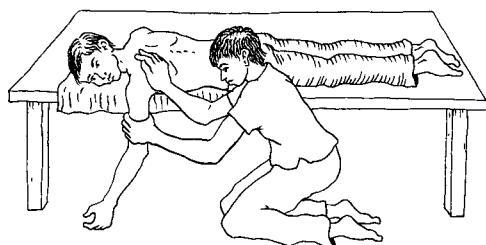
If pain is severe after resetting a dislocated joint, there may be a broken bone.

Dislocated shoulder

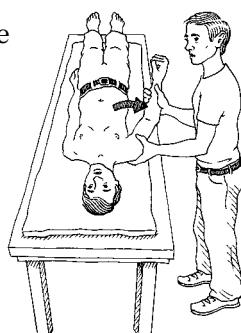
Have the person lie face down on a table or surface that is high enough that the dislocated arm can hang down without touching the ground. Ask the person to hold a bucket with 5 to 7 liters of water for 20 to 30 minutes. Tying an object weighing 3 to 5 kilos (5 to 10 pounds) to the person’s wrist with a soft cloth works too. This will tire the muscles so they relax, pull the arm down, and allow the shoulder to go back into place.



If the shoulder does not go back into place, gently but firmly push on the tip of the scapula (wing bones) with your thumb. The arm should ‘clunk’ back into place.



A different method is to have the person lie face up. Slowly rotate the arm toward you like this. It is best to have a helper holding the person's body still, so that just the arm moves.



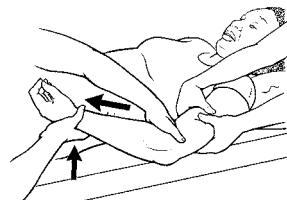
After, sling the arm like this to prevent it from slipping out of the joint again.



Dislocated elbow

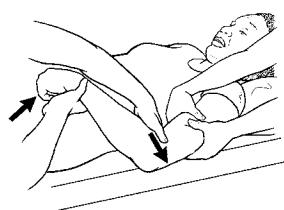
Step 1:

Have the person lie down, then place the forearm straight in line with the upper arm to line up the bones.



Step 2:

Have a helper firmly hold the upper arm. Pull the forearm towards you, and gently bend the elbow.



Step 3:

Now push straight down on upper arm as you bend the elbow the rest of the way. You should feel a "clunk." Splint the elbow to prevent it from slipping out of the joint again.

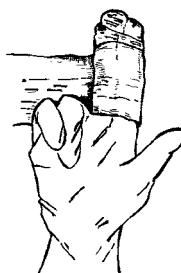


Important

If there is a lot of resistance, stop! You may break the bone. Splint the elbow like this and get medical help.

Dislocated finger

Firmly pull a dislocated finger out, and then push the base of the bone into place to set it.



Splint the dislocated finger to the next finger.

Sprains and strains: the twisting or tearing of muscles and ligaments

SIGNS

- Swelling
- Pain
- Bruising or redness



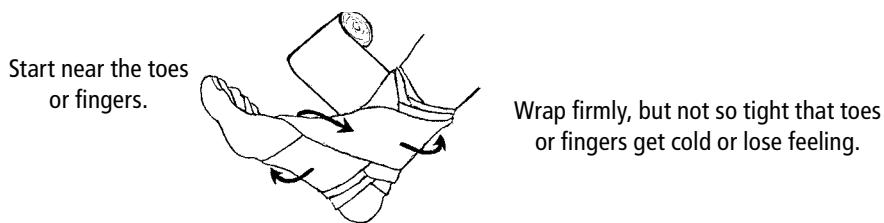
TREATMENT

- **Rest:** do not put weight on the injured part. Using a sling or crutches can help.
- **Ice:** for about 30 minutes every 2 to 4 hours. Less often after a few days.
- **Compress:** wrap firmly with a bandage.
- **Elevate:** raise the injured part using a pillow or folded blankets. Elevate all the time at first, and every few hours after a few days.

These measures will lessen pain and swelling. If started right away and continued, they will help the injured part heal more quickly and with fewer lasting problems.

Keep pressure and weight off the injury. Minor sprains and strains usually take 1 to 2 weeks to heal.

How to wrap a bandage



Bruises

A bruise means that the tissue under the skin has been damaged and some blood is leaking out of the blood vessels. Bruises can hurt a lot and cause concern to the person, but they are usually not a problem. Treat a bruise the same way you would a sprain or strain: with rest, ice, compression, and elevation.

A bruise on the head or abdomen may be a sign of a more serious problem. See what to do if the person recently suffered a hard blow to the head (pages 23 to 24) or was struck in the abdomen (page 27).

If you notice someone getting bruises often, or with several bruises at different stages of healing, it may be a sign of abuse. Gently try to find out if they are in danger and need help.

Rape

Forced sex, sex that is not wanted or agreed to, is rape. Women or girls may be raped by strangers but most often it is by people they know, including family members, their husbands or boyfriends. Men and boys are also raped. For more on rape, see chapter 18 in *Where Women Have No Doctor*.

A person who has been raped will need first aid for any physical injuries. Emotional support is also very important. Treat people who have been raped with kindness and understanding; do not blame them.

Rape can cause pregnancy. Emergency contraceptive pills or the right dose of some types of birth control pills can prevent pregnancy if taken within 5 days of sex. See the chapter on Family Planning, page 23. Rape can also spread sexually transmitted infections (STIs). Health workers can provide medicines that prevent HIV (with medicines known as PEP) and treat STIs after rape.



Someone who was raped may find it difficult for you to see or touch their body, so explain what you will be doing as you begin each step of your examination or treatment. Ask for permission each time before touching.

If the anus or genitals have tears, cuts, or bruises, these will be painful. Give paracetamol (acetaminophen) or ibuprofen. If there is a lot of bleeding in the anus or vagina, show how to use pressure to stop it, in case bleeding starts again later.

For small cuts and tears, soak in warm water 3 times a day. Pouring water over the genitals while passing urine may help reduce discomfort. Larger cuts or tears may need to be sutured.

Look for injuries to other areas of the body as well, and see other parts of this chapter to treat specific problems. A record of the physical exam and any injuries is necessary if the case is reported to the police, even if a decision to go to the police is not made until much later.

Follow up with the person after a few days to see how they are doing emotionally and physically. Check cuts or tears for signs of infection. Bladder infections are especially common for women after forced or violent sex. Pain or a burning sensation while passing urine, and feeling like you need to pass urine very often, are common signs of bladder infection.

Clinic Report	
Date:	
Time:	
Patient's Statement:	
Exam:	

Mark down all the injuries that you find and, if you have permission, take photographs. These can help you see how injuries are healing when you follow up. They can also be used as proof that violence or a crime took place.

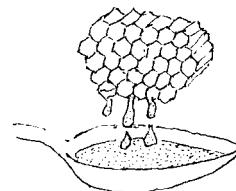
Burns

Minor burns

For a minor burn, immediately pour cool water over the burned skin for 15 to 30 minutes. This will cool and clean the skin and help reduce the pain.

Keep the area clean with mild soap and water as it heals. Honey or aloe vera juice speed healing of smaller burns, but should be put on only after the burn has cooled.

Minor burns should heal in about 1 to 3 weeks.



Dangerous burns

Dangerous burns include:

- **Deep burns** (called deep partial thickness, or full thickness burns). They do not hurt unless pressed on because the nerves have been destroyed. They do not change color if pressed on. They may look mottled in color, or if deeper, they may be waxy white, leathery gray, or charred black.
- **Large burns.** A large burn is one that covers 10% or more of the body. Even if not deep, a burn this large is dangerous. You can estimate how much of the body is burned based on the size of the palm of the hand of the burned person. Does the burn cover about the size of one palm? That is about 1% of their body surface. 10 palms is about 10%.
- **A burn that affects a joint, the face, or the genitals.** These can scar badly and disable the person, especially a child.
- **Burns combined with other injuries.**
- **Burns in children.** Children have much more difficulty recovering from burns and whenever possible should be cared for in hospitals equipped to treat burns.

Get help for dangerous burns. On the way to the medical center, give small sips of water frequently if the person is alert. Cover the area of the burn with a very clean cloth. For dangerous burns, avoid immersing the burn in cold water—it can make the body temperature drop too low and the person can become dangerously cold. Try to calm the person.

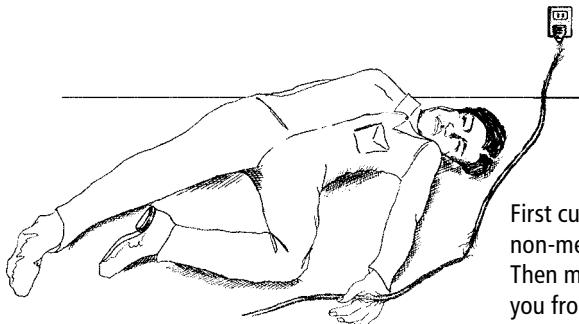
TREATMENT

- Salbutamol (page 79) can help a person breathe more easily if they inhaled a lot of smoke.
- A person with a large or deep burn can easily become dehydrated because body fluids are lost as they ooze from the burn. Give extra fluids. It is usually best to give intravenous (IV) fluids, but large quantities of rehydration drink will work for someone who is alert and able to drink. Watch for danger signs of shock (page 12) that can come from dehydration.
- Burns and the area around them are very prone to infection. Keep the burn clean and wash it each day with running water or by briefly soaking it in clean water. A little mild soap is helpful but do not use disinfectants or iodine—they will delay healing. Gently wipe or scrape away small amounts of dead tissue.
- Cover the burn with antibiotic ointment and then with very clean fine mesh gauze or another very clean dressing. Wrap firmly to create pressure without cutting off circulation. Change the bandage each day and every time it gets dirty. A dirty bandage can cause infection. You may need to soak off a bandage that has stuck in place. Be sure to individually wrap and separate burned fingers and toes.
- Give antibiotics if any of these signs of infection appear: increasing redness, heat, pain, swelling, bad smell or pus, or the person gets a fever. See more about medicines for burns on page 77. Make sure tetanus vaccinations are up-to-date (pages 74 to 75).
- If a blister has opened, keep the area clean. If the blister has not opened, do not try to pop it. Opened blisters are more likely to get infected.
- Burns are extremely painful. Do not hesitate to give strong pain medicine including morphine or other opiates (see pages 86 to 87). Always give pain medicine before cleaning or changing a dressing on a serious burn. As burns heal they can start to itch. An antihistamine provides some relief (see page 77).
- Plenty of nutritious food, including extra protein, is needed to help a burn heal. While healing, try to eat at least 4 meals each day that have protein (such as chicken, other meats, eggs, milk, fish, beans, and nuts), as well as snacks.
- Burned parts may become stiff and immobile as they heal, especially if the burn is on a joint. These parts must be moved every few hours. If the person cannot move a joint herself, gently help her.

As with any serious injury, get help if the person gets worse or you cannot provide needed care.

Electric shock

Electric shock can cause burns and stop the heart.



First cut the power or use a non-metal tool to move the wire. Then move the person. This protects you from getting shocked too.

1. **If a person is being shocked:** Do not touch the person. The electricity can pass through his body and shock anyone who touches him. First, unplug or turn off the machine or tool causing the shock. If you cannot turn off the power, use dry clothing, rope, or a piece of wood, such as a broom handle, as a tool to separate the victim from the power source. Do not use anything wet or made of metal. If the person is lying in water, use the wood or cloth to drag him out, and do not step in the water yourself! Then you can move the person away from the source of electricity.
2. Electric shock can cause breathing to stop. Start rescue breathing (see page 7).
3. If there is no heartbeat try to start the heart by giving chest compressions – press hard and fast on the middle of the chest (see page 8). It may take a long time. Keep trying.
4. If the person is breathing and her heart is beating, look for signs of burns. As with a gunshot wound, there should be both an entry and exit burn.
5. Check for other injuries. Mental confusion, nerve damage (problems with feeling or movement), hearing loss, or circulation problems can all arise. If the person fell, he may have a head injury, broken bones, or bleeding.

If the shock was low-voltage, and the person has no sign of problems after a few hours, he will likely be OK. If the shock was high-voltage or from lightning, or if the person has lingering problems, be more cautious. Burns inside the body can be much more severe than burns on the skin where the electricity entered and left the body. IV fluids and other remedies may be needed. It may take days or weeks to know the real damage.

Chemical Burns

Protect yourself first: Wear long sleeves and gloves or bags over your hands. Cover your mouth with a handkerchief. Wash yourself and your clothing thoroughly after helping anyone who has been exposed to chemicals.

The best way to prevent damage from chemical burns is to **get the chemical off as fast as possible.**

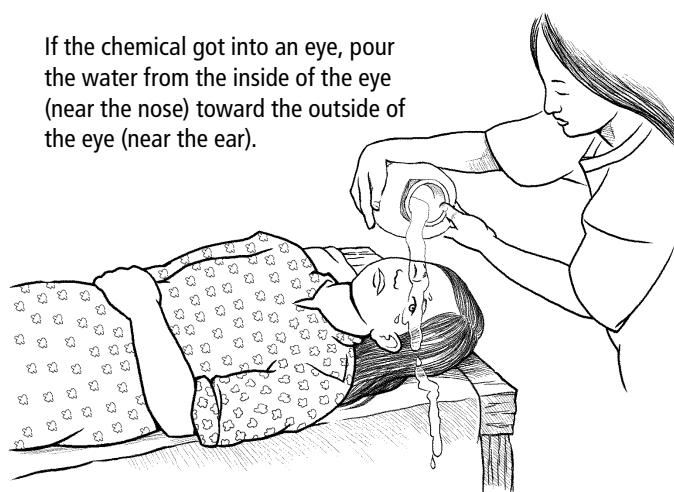


1. Take off clothing and jewelry near the burn.
2. If the chemical is sticky, quickly scrape it off with a flat stick, the side of a knife, or something else stiff.
3. Once you have scraped off all the chemical you can, **rinse the area with lots and lots of water.** Water can cause some chemicals to start burning, so be sure you have first removed as much of the chemical as possible. For an oily chemical, use soap and water. Use a hose or tap if you have one. If the face is affected, wash it first. Especially clean out any cuts or openings in the skin. The faster you start washing and the longer you wash, the better the skin can survive.

After you have cleaned all the chemical off the person, treat the chemical burn as you would any other burn (see page 38).

Wash or discard all clothes that have come into contact with the chemicals, as they can also cause damage.

If the chemical got into an eye, pour the water from the inside of the eye (near the nose) toward the outside of the eye (near the ear).



Police Weapons

Be careful: people helping victims of police violence often become targets of more police violence themselves. Try to get the injured person and yourself out of immediate danger.



Pepper spray and tear gas

Move away from where tear gas or pepper spray is being used, the effect will wear off. Tear gas wears off quickly, pepper spray can last an hour or more.

A water or vinegar-soaked bandana over the mouth and nose gives a little protection. Make a face shield out of a clear plastic bottle to protect your eyes if chemicals are sprayed directly at you.

Do not touch tear gas canisters with your hands. They are hot and will burn you if you pick them up right away.



1. **Watch breathing.** Pepper spray can cause severe breathing problems, especially in people with asthma. This can be very frightening. Help the person stay calm.
2. **Flush eyes** with lots of water. Pour the water from the inside of the eye (near the nose) toward the outside of the eye (near the ear).
3. **Remove clothes** that have spray on them once you are in a safe place and will not be exposed to any more spray or chemicals.
4. **Clean the skin, one area at a time (or just wait for the spray to wear off):** soak a cloth with mineral or vegetable oil. Wipe off one area of skin using this oiled cloth. Then quickly remove the oil with another cloth wet with alcohol. If the oil is left on for more than 30 seconds, it will mix with the chemical and burn the skin. If you do not have oil and alcohol, just use a lot of water. Or just wait. With time, the pain will go away.

An eye and mouth rinse to relieve the burning of pepper spray

In a small bottle, mix ½ water, ½ liquid antacid (aluminum or magnesium-based, such as *Maalox*).

For the eyes, hold the person's eye open and pour from the inside (close to the nose) toward the outside of the eye (closer to the ear).

For the mouth, ask the person to swish the mixture inside the mouth and spit it out.

This mixture can be of some help to rinse pepper spray off skin.

Other police weapons

Rubber bullets, tear gas canisters, water cannons, and batons are all used to cause bleeding, broken bones, or injuries or bleeding inside the body. Injuries to the eye and head can be severe. Examine the person head to toe. Watch for signs of internal bleeding or shock: feeling faint, pale skin, dropping blood pressure and a weak, fast pulse. The chapter Problems with the Eyes and Seeing has information on treating injuries to the eye.

Mental Health Emergency

Abrupt changes in thinking, behavior, hallucinations, and severe confusion can be frightening for the person experiencing it, and also for the people around them.

When someone's thinking and perceptions cause them to want to hurt themselves or others, it becomes an emergency and they need help quickly. As with any other emergency, first try to check breathing, stop any bleeding, and check for other physical injuries. Then reassuring, calming and comforting a person having a mental health emergency can save lives.

If someone says he wants to hurt himself or others, believe him.

If the person is dangerous to others, it is often easier to move other people away than to move him. You may need help to make him and the area around him safe. And look out for your own safety as well.

If he says he wants to hurt or kill himself, the first thing he needs is someone to listen calmly. Ask gentle questions, to show you care and to be sure you understand. Your questioning can help to interrupt his thoughts and distract him from his purpose.



1. Ask if he plans to hurt himself or someone else, or if he has already done so.



2. Ask how he plans to do it, and if he has the means to do it. The more specific the plan, the more serious the problem.



3. Ask the person to make an agreement that he will not hurt himself or others. Take away the means he would use to hurt himself or others.



Making an agreement like this can keep someone OK long enough to get more lasting help. **Do not leave him alone.** Stay with the person, or have family members or friends stay with him. Make sure he stays sober and does not drink alcohol or use drugs. Alcohol or drugs can further cloud his judgement and make self-harm more likely. It may be helpful to seek the help of spiritual or community leaders who he respects. Following up to see that he continues to get help, and to show that you care about him, is important.

Asking someone if he wants to kill himself does not make him more likely to do so.

Poison

For most poisons: quickly flush the poison out by drinking **large amounts of water**. Taking **activated charcoal** will help remove the poison through elimination later in stool. If you know the specific poison, see the chart on pages 46 to 48 for information on what to do.

For an adult: Give 50 to 100 grams activated charcoal mixed with water.

For a child: Estimate how much the child weighs and give 1 gram activated charcoal per kilogram of weight, mixed with water.

Activated charcoal is an inexpensive and very helpful remedy to keep in your medicine supply, see page 80 for more information.

Do not give water, charcoal, or anything else to swallow to someone who cannot breathe well or is losing consciousness. Remember: maintaining breathing is always most important.

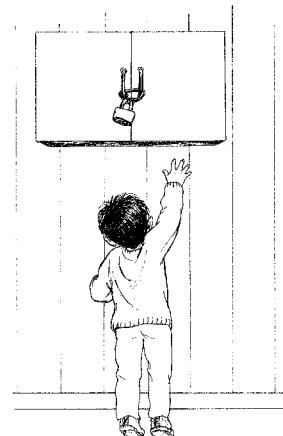
Vomiting is not usually helpful for poisoning, and it can be dangerous. Someone who has swallowed corrosive chemicals like acids or lye, or gasoline, kerosene, or turpentine, or who is having trouble breathing should never try to vomit up the poison.

If you do try to vomit, do so as soon as possible, within the first few hours. To encourage vomiting, touch the back of the throat with a finger or swallow a spoonful of salt.

PREVENTION

Poisoning is preventable. Label all poisons and medicines clearly. Keep them out of the reach of children in high or locked cabinets. Never use empty poison containers for food or drink even if you clean them first. Likewise never put poisons in bottles or containers made to be used for food or drink.

Poison is a common method people use to kill or harm themselves. Locking away poisons, guns, and other potentially deadly materials is a surprisingly effective way to prevent suicide deaths. For more on how to help someone who wants to kill himself, see Mental Health Emergency (page 43).



Keep all poisons out of the reach of children.

CHEMICAL POISONING

Types of chemicals

△ Signs of poisoning

+ What to do

Corrosives:

- Ammonia
 - Batteries
 - Acids
 - Drain cleaner
 - Caustic soda
 - Lye
-
- Acids or bases. These chemicals burn the inside of the body.
- Extra saliva.
 - Pain in mouth, throat, chest, stomach, or back.
 - Vomiting.
 - Difficulty swallowing.

Hydrocarbons:

- Gasoline
 - Carbolic acid
 - Turpentine
 - Paint thinner
 - Camphor
 - Pine oil
 - Kerosene
 - Phenol
-
- These are most dangerous if breathed into the lungs.

• Difficulty breathing.

- Coughing, choking, gagging.
- Fever.
- Seizures or loss of consciousness (passing out).
- The breath may smell like the poison.

Cyanide:

Gets into air or water from use in: mining, factory work, animal hide, hair removal (tanning). Can be breathed in or swallowed from contaminated food or water.

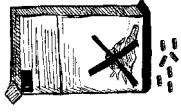
- Breathing problems.
- Headache, confusion, and seizures.
- There can be long lasting damage to the brain.

• Do not try to vomit.

- Activated charcoal is of little use.
- Give as much water as you can. Get help.
- Do not give activated charcoal.
- Give a lot of water.
- Wash hydrocarbons off skin and hair and take off any contaminated clothes.
- Give help with breathing if needed (see page 7) and watch the person's breathing for 2 days.
- Get help.

- Do not try to vomit.
- Watch for breathing problems and try to restart the heart if it stops (pages 7 to 8).
- Using a paper mask when beginning rescue breathing prevents the cyanide from passing to you.
- Give lots of water.
- Can be treated with sodium nitrite followed by sodium thiosulfate (page 83).
- Hydroxocobalamin is also used.

CHEMICAL POISONING

Types of chemicals	△ Signs of poisoning	+ What to do
Organophosphates and carbamate. Found in certain pesticides including:	<ul style="list-style-type: none"> • Slowing pulse, muscle weakness, breathing problems. • Runny nose, crying, drooling. • Seizures. • The breath may smell like fuel or garlic. • Life-threatening problems can happen days after this poison is taken, and long-term nerve problems can happen weeks after. <p>These chemicals can stop breathing or cause other whole-body problems.</p>	<ul style="list-style-type: none"> • Watch for breathing problems and give rescue breathing if needed. • Atropine is an antidote (see page 81). • Give activated charcoal if it has been less than 1 hour since the poisoning (see page 80). • Wash the skin right away and throw out contaminated clothes. • Treat seizures with diazepam (see page 88).
Herbicides:	 <p>Can be absorbed through the skin, by breathing it in, or most dangerously, by swallowing.</p>	<ul style="list-style-type: none"> • Breathing problems (can happen days after). • Mouth pain. • Red or brown urine, or little or no urine (a sign that the kidney is failing—very dangerous). • Large quantities can cause burns in the mouth and throat, stomach pain, and breathing problems.

POISONING WITH MEDICINES AND OTHER DRUGS

Types of Drugs	△ Signs of overdose	+ What to do
Iron:		
<ul style="list-style-type: none"> • Ferrous sulfate • Ferrous gluconate • Prenatal vitamins • Multivitamin pills or syrups 	 <ul style="list-style-type: none"> • Pain, vomit or bloody vomit, diarrhea, confusion. • Shock immediately or up to 2 days later. • An overdose damages the stomach and intestines. 	<ul style="list-style-type: none"> • Immediate vomiting may help. • Give lots and lots of water. • Activated charcoal is not helpful. • Deferoxamine is an antidote (page 82). • Watch for breathing problems.
Paracetamol:		
<ul style="list-style-type: none"> • Acetaminophen (Panadol, Tylenol, Crocin, and other brand names) 	 <ul style="list-style-type: none"> • Many combination cold medicines and pain medicines (read the label) • An overdose is poisonous to the liver. 	<ul style="list-style-type: none"> • Nausea, sweating, pale skin, tiredness. • Later there may be liver pain (right upper belly), jaundice, confusion, or bloody urine. • Give activated charcoal (page 80) and lots of water. • Acetylcysteine is an antidote (page 82).
Opioid medicines and drugs:		
<ul style="list-style-type: none"> • Morphine • Fentanyl • Heroin • Methadone 	 <ul style="list-style-type: none"> • Opium • Oxycodone • Codeine • An overdose can cause the person to stop breathing. 	<ul style="list-style-type: none"> • Slow thinking, slow reactions, slow, shallow or stopped breathing. • Other strong pain medicines • If the person is breathing fewer than 12 breaths a minute give rescue breathing (page 7). • Naloxone is an antidote (page 83). • Do not let the person drink or swallow until she is breathing well.
Alcohol		
	 <ul style="list-style-type: none"> • An overdose can cause the person to stop breathing. 	<ul style="list-style-type: none"> • Vomiting. • Confusion. • Seizures. • Slow or irregular breathing. • Loss of consciousness. • Confusion, changes in consciousness, irregular breathing, and feeling or looking ill could also be signs of a diabetic emergency (see page 49).

Diabetic Emergencies

Diabetes is a disease that affects the body's ability to process sugars in food. Someone with diabetes can suddenly become ill if he has too much, or too little, sugar in his blood. Diabetes is more common in people who are overweight, but anyone can get diabetes. The chapter on Diabetes has more information about prevention and treatment of diabetes.

If you know someone is having an emergency due to diabetes but you are not sure if the problem is from low blood sugar or high blood sugar, treat as if he has low blood sugar (give a small amount of sugar), and then take him to get medical help.

Low blood sugar (hypoglycemia)

This condition can only happen to a person treating his diabetes with medicines. A person's blood sugar can drop too low if he is taking insulin or another diabetes medication and if he takes too much medicine, does not eat enough food, does too much physical activity, waits too long between meals, or drinks alcohol.

Someone with low blood sugar may become clumsy, confused, nervous or irritable. He may sweat or tremble. When that happens, he must eat. If he does not, his condition will worsen and will develop these danger signs:

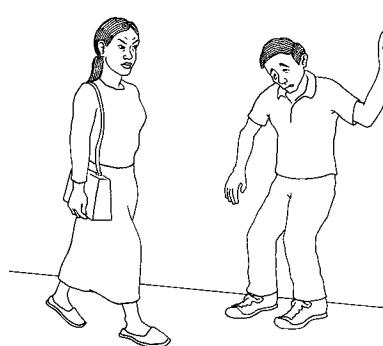
DANGER SIGNS

- Trouble walking or feeling weak
- Trouble seeing clearly
- Confusion or acting in a strange way (you may mistake him for being drunk)
- Losing consciousness
- Seizure

TREATMENT

If he is conscious, quickly give him sugar: fruit juice, soda, candy, or a glass of water with several spoons of sugar in it will all work. He should eat a full meal soon after as well. If he is still confused or does not begin to feel better 15 minutes after you have given sugar, get help.

If he is unconscious, place a pinch of sugar or honey under his tongue. Keep giving small amounts. It takes time for the body to absorb sugar. When he wakes up you can give him more.



Low blood sugar can look a lot like the person is drunk and can be overlooked as being a real emergency.

High blood sugar (hyperglycemia)

A person with diabetes can have too much sugar in his blood if he eats too much food, is less active than usual, has a serious illness or infection, does not take his diabetes medicine, or gets dehydrated. This can happen to a person even if he does not yet know he has diabetes. Get help for these signs:

SIGNS

- Feeling thirsty and drinking a lot
- Frequent urination
- Blurry vision
- Weight loss
- Nausea and vomiting
- Abdominal pain

If not treated, high blood sugar can be very dangerous and can lead to a coma or even death. You can save a person's life by getting help for these more dangerous signs:

DANGER SIGNS

- Fast heart rate
- Fruity odor on breath
- Dry skin
- Low blood pressure
- Confusion
- Fast, deep breathing
- Loss of consciousness

TREATMENT

Take him immediately to a medical center. If he is conscious, give him plenty of water to drink. Give a little at a time.

If you are certain he has high blood sugar and know his insulin dose, give a small amount of insulin on the way to help. But if you are not certain, do not give insulin. Giving someone insulin when they have low blood sugar can kill them.

Seizures, Convulsions

Seizures are sudden, usually brief, periods of unconsciousness or changes in mental state, often with jerking movements.

Seizures may be caused by high fever, meningitis, dehydration, an injury, malaria, poisoning, or other reasons. If none of these dangerous causes of seizure seem likely, a single seizure may not be a problem (although it can be very frightening to watch).

When seizures recur, this is often from epilepsy, a chronic condition that can be controlled with medicines. See a health worker.

TREATMENT

During a seizure, clear the space around the person so she does not hurt herself. Turn her on her side so she does not choke if she vomits. **Do not hold a seizing person down or try to hold her tongue. Get medical help.**

For seizure from **dehydration**: after the seizure is over, give rehydration fluids.

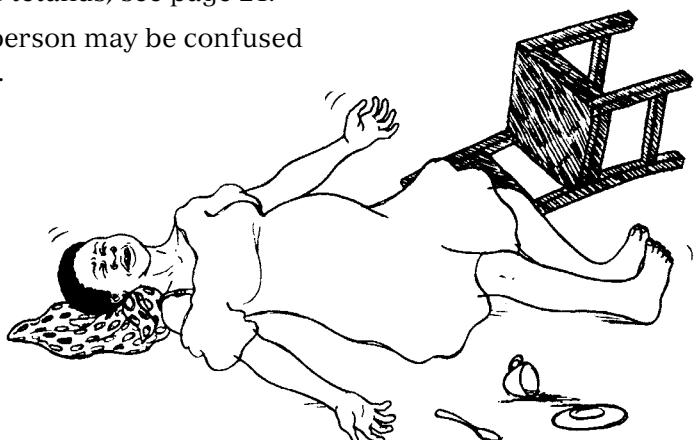
For a seizure from **meningitis**: the child will need a combination of specific antibiotics immediately and other emergency medical help.

For seizure from **malaria**: treat the malaria as soon as possible with the malaria medicines used in your region, usually artesunate. Seizures and convulsions can be a sign of severe malaria, which can cause death if not treated quickly.

If the seizure lasts more than 15 minutes, put liquid diazepam in the anus using a syringe without a needle. Do not give more than the recommended dose and do not give more than 2 doses (see pages 88 to 89).

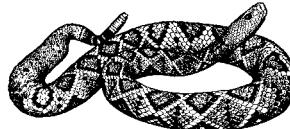
The spasms caused by **tetanus** can be mistaken for seizures. The jaw shuts tightly (lockjaw) and the body suddenly bends back. Learn to recognize early signs of tetanus, see page 21.

After a seizure, the person may be confused or drowsy. Comfort her.



Stings and Bites

Do not cut open a bite or sting or try to suck out the poison. Also, tourniquets will not stop the spread of poisons from stings or bites, but will cause serious harm.



Most bites and stings are painful but not dangerous, and even deadly creatures do not usually inject enough venom to kill. Stay calm and watch the bitten part. If there are no problems or if problems improve after a few hours (depending on the creature) there is likely nothing to worry about. Because children are small, the venom can affect them and do more harm, so they may need more attention.

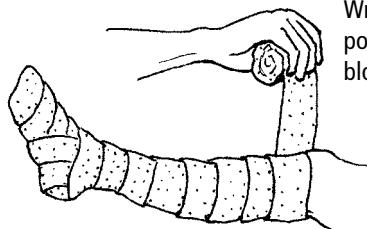
Snake bites

1. Move away from the snake. Some snakes can still bite for a few minutes even after they are dead.
2. Remove jewelry or clothes near the bite because the body may swell.
3. Keep the bitten part of the body below the heart. **Then keep that body part still** by putting on a splint or sling. Using the muscles spreads the poison.
4. Gently clean the wound. Do not rub it.
5. For most snakes, or if you do not know what type it was, watch and wait for a few hours. If there is little or no swelling, pain, or redness, there is no problem. Danger signs include severe swelling or pain, drowsiness, droopy eyelids, dizziness, weakness, nausea, or bleeding from the mouth or nose.

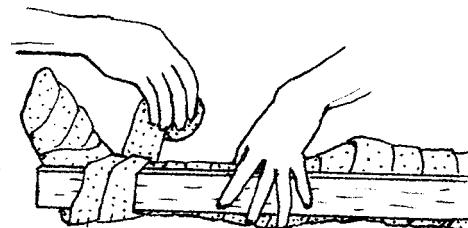
Ask the person to swish water in the mouth and spit in a light-colored bowl. If the spit is pink or visibly bloody, the gums are bleeding. This is a danger sign.

For these snakes, wrap the bitten area tightly:

- Coral snakes
- Mambas
- South American rattlesnakes
- Sea snakes
- Most cobras – the ones that cause damage throughout the whole body.



Wrap tight—to stop the spread of poison, but not so tight that you cut off blood flow.



Use a splint to keep the limb from moving.

Most vipers and some cobras harm the area near where they bite but do not cause problems throughout the rest of the body. For these snakes, do not wrap the bite.

For many **poisonous snakes** there is an antivenom that can help. If you can get to medical help, describe the snake as well as you can so the right antivenom is used. If possible, stock your medicine kit with snake antivenom for the snakes common in your area before emergencies happen.

For spitting cobra venom in the eye: flush with a lot of water. If you have no water, milk or beer can be used. Do not use strong irritating chemicals.



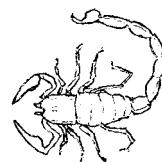
Pythons and boas are not poisonous, but their bites can cause severe skin infections. Watch the wound and if there are signs of infection — increasing redness, heat, pain, swelling, bad smell or pus — treat it as an infected wound (pages 19 to 20). Occasionally these snakes cause crush injuries by squeezing a person.

If the bite mark shows fangs, the snake is venomous. If there are no fang marks, it is less likely that the snake is poisonous, but it still could be.

Spiders and scorpions



Although they may hurt a lot, most spider bites and scorpion stings do not cause serious or lasting harm. Keep the bitten part still and use ice or cold water to relieve pain. Do not cut open the bite or use a tourniquet or bandage. Heat does not help, but keeping still does.



If you know the spider or scorpion is a deadly variety, or, if after the bite or sting there are signs of problems such as: stomachache, itching, sweating, and difficulty breathing, then get medical help. There may be an antivenom.

For Black Widow spider bites or scorpion stings, you can give diazepam on the way to prevent muscle spasms and calm the person (see page 88).

Bees and wasps

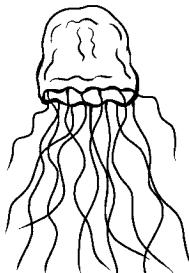
After a sting, check if a stinger was left in the skin and remove it as soon as possible. The area around the sting may get red, swollen and painful. Putting a paste made with baking soda and water, or something cold on the stung area, will help with the swelling and pain.

Severe allergy to bee or wasp stings is rare, but can be deadly. See page 55 for signs and treatment of severe allergy.

Ticks

A bite from a tick can spread many dangerous infections. Check your body well after walking where ticks are common. To remove a tick with tweezers, grasp the tick as close as possible to where its mouth is stuck to the skin. Pull it out gently but firmly so that its head does not remain under the skin. Burn the removed tick with a match or kill it with alcohol, but try not to touch it.

Fish and jellyfish



Get away from jellyfish and scrape off any tentacles. Use seawater to wash. For stinging fish, remove any spines with tweezers or pliers.

Immerse the limb in hot water for 20 minutes to relieve pain, but make sure it is not burning hot. This may work better for stinging fish than for jellies.

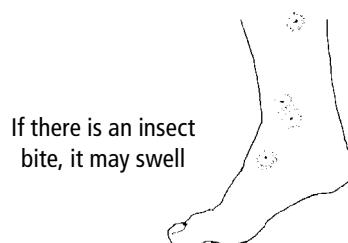
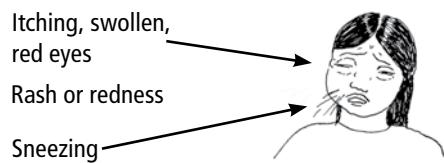
There are many local remedies but they do not work for all fish or jellyfish. For example, box jellyfish (sea wasp) stings are helped by washing with vinegar. But vinegar makes the stings of other jellyfish worse. Papaya or meat tenderizer is a well-known home remedy for jellyfish stings but it does not seem to work for all jellyfish and sometimes makes the pain worse.

Allow the person to use and move their limbs—unlike with snake and spider bites, keeping still does not help. Get medical help if there are problems breathing or other signs get worse.

Allergy: Mild or Severe (Anaphylaxis)

Mild allergies are caused by dust, pollen, insect bites, or certain foods, chemicals or medicines. These are usually treatable with antihistamines (see page 77).

SIGNS OF A MILD ALLERGY



A severe allergic reaction is much more dangerous and can quickly stop someone's breathing.

SIGNS OF A SEVERE ALLERGY (ANAPHYLAXIS)

- Flushing, itching, or rash
- Swollen lips, mouth, or throat, difficulty swallowing
- Difficulty breathing
- Swollen hands or feet
- Nausea or stomachache

The most common signs are rash and breathing problems.

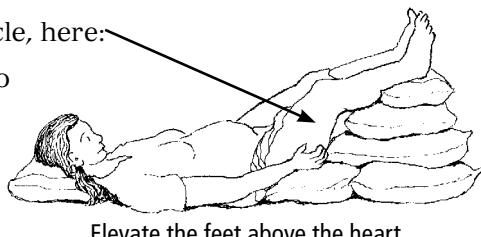
If the person cannot swallow, or is having trouble breathing, **give epinephrine right away** (page 79). You can give another dose in 5 to 15 minutes if necessary.

Epinephrine comes in different strengths and different amounts may be needed to give the same dose. Figure out the correct amount and have it ready in a medicine kit **before** emergencies happen. Or stock a pre-loaded injection, called an *EpiPen* or known by other brand names.

Inject epinephrine in the thigh muscle, here:

For breathing problems you can also give salbutamol (see page 79). It is also a good idea to give an antihistamine (see page 77).

In most cases, if you ever have an allergic reaction to a medicine, food, bee sting, or something else, you should avoid it forever after. The second time you are exposed you can expect an even worse reaction.



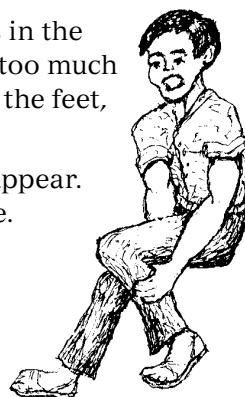
Elevate the feet above the heart

Heat Emergencies

Heat cramps and heat exhaustion (heat sickness)

Working hard in hot conditions can cause painful cramps in the legs, arms, or stomach. This is probably caused by losing too much salt from sweating. Gently stretch out cramps, by moving the feet, or slowly walking.

Treat heat exhaustion (heat sickness) as soon as signs appear. If not treated, heat exhaustion can worsen into heat stroke.



SIGNS

- Extreme thirst.
- Weakness.
- Headache.
- Nausea or abdominal cramps.
- The skin is usually sweaty and may be cool and pale.
- There may be a prickly feeling on the skin or a rash.



TREATMENT

- Rest in a cool place. Take off extra clothes.
- Give rehydration drink —mix $\frac{1}{2}$ teaspoon salt and 8 teaspoons of sugar or cooked cereal in 1 liter water.
- Give plenty of other cool liquids too.

Heat stroke

Heat stroke is a very dangerous condition that is caused by being too hot for too long. Left untreated, it can kill.

SIGNS

- Fast pulse and fast breathing
- Skin flushed (red), warm, dry or clammy
- Vomiting or diarrhea
- Confusion
- Passing out or seizures
- High fever, greater than 40° C



Heat stroke happens to people who are not able to recover quickly enough from getting too hot: old people, babies, the ill, very fat people, and alcoholics are most vulnerable.

Heat stroke can also happen to a healthy young adult who has worked or exercised too long in the heat. These people tend to be sweaty instead of having dry skin.

TREATMENT

Cool the person as fast as possible: move to the shade. Take off extra clothes. Fan the person and wipe them with cool, wet cloths all over the body. Put ice packs or cold cloths on the neck, armpits, and groin. An otherwise healthy person can be dunked in a bath of ice-cold water, but this is dangerous for an old person or someone who is already ill.

When the person is alert, give rehydration drink (see page 56). Or give a lot of any cool drink. But be careful the person does not choke: breathing problems are common with heat stroke.

Someone with heat stroke can get worse quickly so if possible it is best to get medical help.

PREVENTION

To prevent heat-related problems outside, wear light-colored clothing and shade the face and back of the neck with a hat. Indoor work spaces should have enough air flow and fans. Take regular breaks and drink lots of liquids. Avoid or limit drinking beer and other alcohol while working or playing sports in the heat because alcohol causes dehydration.

Sunburns

Problems with sunburn usually are often more serious for people with light skin color. The skin becomes red, painful, and hot, and in severe cases it will blister and swell. Blisters from sunburn, as from other burns, can get easily infected. A single sunburn is not dangerous, but many sunburns over time can lead to skin cancer (for information on skin cancer, see page 18 in the chapter on Cancer).

A sunburn will heal on its own after a few days. Aloe or a mild pain medicine can help. There may be some local treatments in your area that cool and relieve the skin.

**PREVENTION**

Wear a hat and clothing that covers the skin when the sun is strong. Sunscreen lotion that is rubbed into the skin before going into the sun can also help prevent sunburn.

Cold Emergencies

Hypothermia, getting too cold

Being too cold for too long can be deadly. It can quickly cause confusion, affect judgment and make it harder to think clearly about how to get warm.

SIGNS

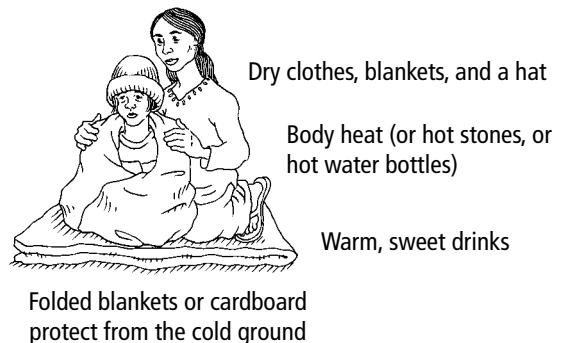
- Shivering
- Fast breathing and heart rate
- Difficulty speaking clearly, clumsiness
- Confusion
- Having to urinate more

As hypothermia gets worse, the pulse and breathing may slow down. The person may sit down, stop shivering, and in her confusion may start to take off clothes. Eventually she can pass out or die.

TREATMENT

Give rescue breathing if needed (page 7). A very cold person can recover after a long time of not breathing, so you may need to give rescue breathing for an hour or more.

- Get somewhere warm and dry.
- Remove wet clothes.
- Cover in warm, dry blankets. Be sure to cover head, hands, and feet.
- Do all you can to keep the person warm. Cuddle up close to the person, heat stones and then wrap them in cloth, or use hot water bottles to warm the person. But beware of burning the skin.



If the person can sit up and hold a cup, give warm drinks. Do not give alcoholic drinks. While they may feel "hot" in your throat or stomach, alcoholic drinks cause the body to lose heat. Also give food. Candy and sweets are especially helpful. Give a meal soon after. Encourage the person to drink plenty of water.

If the person has severe hypothermia—a body temperature of 32° C (90°F) or less, is unconscious, not shivering anymore—be as gentle as you can while quickly transporting her to help.

Frostbite (frozen body parts)

Toes, fingers, ears, and other body parts can freeze. Eventually they "die," turning black. If you act fast at the first signs of frostbite, you can save these body parts that otherwise might need to be cut off.

SIGNS

- Skin cold, waxy, pale, splotchy
- Tingling, numbness, or pain
- The body part may be frozen hard

Light, mild frostbite turns the skin red. A few days later it peels. If it is a bit deeper, frostbite leaves the skin feeling hard, but soft underneath. Blisters may form the next day. When the muscle freezes, the frostbite is deep. The area is hard. It may blister only at the edges, or not at all. The blisters may fill with blood.

TREATMENT

Get out of the cold and quickly warm the frozen part. For fingers, the easiest thing is for the person to hold her hands in her own armpits or between her thighs. Or wrap the frozen parts in warm, dry cloths. Keep the frozen area still and try not to walk on frostbitten feet.

For deeper frostbite, fill a basin with warm (not hot) water. If you have a thermometer, try for 39° C (102°F). Soak the frozen part in the water. Check the water first to prevent burns. **Do not rub.**

The frozen part should thaw within 45 minutes. As it warms, it will hurt. Give pain medicine (page 84). Do not let it become frozen again.



*It is better to let the area stay frozen
than to thaw it and let it freeze again.*

As frostbite heals over the coming days and weeks, treat it as you would a burn (see page 38).



First Aid: Medicines

Antibiotics Fight Infection

Antibiotics are medicines that fight infection from bacteria. They do not help against infections from a virus such as chicken pox, rubella, flu, or the common cold. Not all antibiotics will fight all infections from bacteria.

Antibiotics that share the same chemical make-up are said to be from the same family. It is important to know about the families of antibiotics for two reasons:

1. Antibiotics from the same family can often treat the same problems. This means you can use a different medicine from the same family.
2. If you are allergic to an antibiotic of one family, you will also be allergic to the other members of the same family of antibiotics. This means you will have to take not just a different medicine, but a medicine from a different family instead.

Antibiotics must be given for their full course. Stopping before you have finished all the days of treatment, even if you feel better, can make the infection return in a form that is even harder to stop.

The penicillins

Medicines in the penicillin family are some of the most useful antibiotics because they fight many infections.

Penicillin is measured in milligrams (mg) or units (U). For penicillin G, 250 mg = 400,000 U.

For most people, penicillin is one of the safest medicines. Using more than the recommended amount wastes money but is not likely to harm the person.

Resistance to penicillin

Certain infections have become resistant to penicillin. This means that in the past penicillin would have been able to cure someone with these infections, but now penicillin does not work. If the infection does not respond to ordinary penicillin, try a different form of penicillin or an antibiotic from another family. For example, pneumonia is sometimes resistant to penicillin. Try cotrimoxazole or erythromycin.

Important for all kinds of penicillin (including ampicillin and amoxicillin)

Some people are allergic to penicillin. Mild allergic reactions cause a rash. Often this comes several hours or days after taking penicillin and may last for days. Stop taking the penicillin immediately. Antihistamines (see page 77) help calm the itching. Stomach upset and diarrhea from taking penicillin are not signs of an allergic reaction and, while uncomfortable, are not a reason to stop taking it.

Rarely, penicillin can cause a severe allergy called allergic shock. Within a few minutes or hours after taking penicillin, the person becomes flushed, gets a swollen throat and lips, has trouble breathing, feels faint, and goes into a state of shock. This is very dangerous. Epinephrine (adrenalin) must be injected at once. Always have epinephrine ready when you inject penicillin (see page 79).

Someone who has once had an allergic reaction to penicillin should not be given any kind of penicillin—ampicillin, amoxicillin, or others—ever again, either by mouth or by injection. This is because the next time the allergic reaction could be worse and might even kill him. People allergic to penicillin can use erythromycin or other antibiotics instead.

Injections

Penicillin usually works well when given by mouth. Injected forms of penicillin can be dangerous. They are more likely to cause severe allergic reactions and other problems, and should be used with caution. Use injectable penicillin only for severe or dangerous infections.

Ampicillin and Amoxicillin

Ampicillin and amoxicillin are broad-spectrum penicillins, which means they kill many kinds of bacteria. The two are often interchangeable. When you see a recommendation for ampicillin in this book, you will often be able to use amoxicillin in its place, in the correct dose.

Ampicillin and amoxicillin are very safe and are especially useful for babies and small children.

Side effects



Both these medicines, but especially ampicillin, tend to cause nausea and diarrhea. Avoid giving them to people who already have diarrhea if you can give another antibiotic instead.

The other common side effect is rash. But raised, itchy bumps that come and go in a few hours are probably a sign of penicillin allergy. Stop giving the medicine right away and do not give the person a penicillin medicine again. Future allergic reactions may be more severe and even life-threatening. For some problems, erythromycin (page 67) can be used instead. A flat rash that looks like measles, and usually appears a week after starting the medicine and takes days to go away, is not necessarily an allergy. But it is impossible to know for sure if the rash is from allergy or not, so it is usually better to stop taking the medicine.

Important !

More infections are becoming resistant to ampicillin and amoxicillin. Depending on where you live, they may no longer work against staphylococcus, shigella, or other infections.

How to use

Ampicillin and amoxicillin work well when taken by mouth. Ampicillin can also be given by injection for severe illnesses.

As with other antibiotics, always give these medicines for at least the shorter number of days shown here. If the person still has signs of infection, have her continue taking the same amount every day until all signs of infection have been gone for at least 24 hours. If the person has taken the medicine for the maximum number of days and is still sick, stop giving the antibiotic and get medical help. For people with HIV, always give the medicine for the maximum number of days listed.

Likewise, the amount of antibiotic to take depends on the age or weight of the person and the severity of the infection. In general, give the smaller amount for a thinner person or a less severe infection, and the larger amount for a heavier person or a more severe infection.

AMOXICILLIN (ORAL)

- Give 45 to 50 mg per kg each day, divided into 2 doses a day. If you cannot weigh the person, dose by age:
 - Under 3 months:** give 125 mg, 2 times a day for 7 to 10 days.
 - 3 months to 3 years:** give 250 mg, 2 times a day for 7 to 10 days.
 - 4 to 7 years:** give 375 mg, 2 times a day for 7 to 10 days.
 - 8 to 12 years:** give 500 mg, 2 times a day for 7 to 10 days.
 - Over 12 years:** give 500 to 875 mg, 2 times a day for 7 to 10 days.

AMPICILLIN (ORAL)

- Give 50 to 100 mg per kg each day, divided into 4 doses a day. If you cannot weigh the person, dose by age:
 - Under 1 year:** give 100 mg, 4 times a day for 7 days.
 - 1 to 3 years:** give 125 mg, 4 times a day for 7 days.
 - 4 to 7 years:** give 250 mg, 4 times a day for 7 days.
 - 8 to 12 years:** give 375 mg, 4 times a day for 7 days.
 - Over 12 years:** give 500 mg, 4 times a day for 7 days.

AMPICILLIN (INJECTION)

Ampicillin should be injected only for severe illnesses, or when someone is vomiting or cannot swallow.

- Inject 100 to 200 mg per kg each day, divided into 4 doses a day. If you cannot weigh the person, dose by age:
 - Under 1 year:** inject 100 mg, 4 times a day for 7 days.
 - 1 to 5 years:** inject 300 mg, 4 times a day for 7 days.
 - 6 to 12 years:** inject 625 mg, 4 times a day for 7 days.
 - Over 12 years:** inject 875 mg, 4 times a day for 7 days.

Amoxicillin with clavulanic acid (Amoxicillin-clavulanate potassium)

Amoxicillin with clavulanic acid comes in different strengths of each of the 2 medicines it contains, for example, 500/125 (a 4 to 1 strength because the tablets have 500 mg amoxicillin and 125 mg clavulanic acid) or 875/125 (a 7 to 1 strength). For children, it is best to use the 4 to 1 ratio such as the 500/125 tablet or the liquid medicine where 5 ml contains 125/31.25 or 250/62.5. Often, the dose of amoxicillin with clavulanic acid mentions only the amount of amoxicillin (as we do here).

How to use

Give by mouth with food or milk.

For animal bites

- To prevent infection and using a 4 to 1 strength such as the 500/125 tablet or a syrup made for children, give 20 mg per kg each for 3 to 5 days, divided into 3 doses. If you cannot weigh the person, dose by age:
 - 3 months to 1 year:** give 50 mg, 3 times a day for 3 to 5 days. .
 - 1 to 5 years:** give 125 mg, 3 times a day for 3 to 5 days.
 - 6 to 12 years:** give 250 mg, 3 times a day for 3 to 5 days.
 - Over 12 years:** give 250 mg, 3 times a day OR use the 875/125 tablet, 2 times a day for 3 to 5 days.

If the bite is already infected, give the same dose for up to 14 days.

Penicillin by mouth, penicillin V, penicillin VK

Penicillin by mouth (rather than by injection) can be used for mild and moderate infections.

Even if you started with injected penicillin for a severe infection, you can usually switch to penicillin by mouth once the person starts to improve. If improvement does not begin within 2 or 3 days, consider switching to another antibiotic and get medical advice.

How to use

To help the body make better use of the medicine, take penicillin on an empty stomach, at least 1 hour before or 2 hours after meals.

- Give 25 to 50 mg per kg each day, divided into 4 doses, for 10 days. If you cannot weigh the person, dose by age:
 - Under 1 year:** give 62 mg, 4 times a day for 10 days.
 - 1 to 5 years:** give 125 mg, 4 times a day for 10 days.
 - 6 to 12 years:** give 125 to 250 mg, 4 times a day for 10 days.
 - Over 12 years:** give 250 to 500 mg, 4 times a day for 10 days.

For more serious infections, double the doses above.

For a wound likely to be infected with tetanus, along with medicines to prevent tetanus (page 74), antibiotics are sometimes given. For example, give penicillin G for 2 days, then switch to penicillin V in the dose above for 5 to 8 more days.

For animal bites, give the dose above for 3 to 5 days. Also give metronidazole (page 70) OR clindamycin (page 69).

Injectable penicillin, penicillin G

Injectable penicillin is used for certain severe infections, including infections from wounds.

Injectable penicillin comes in different forms. The main difference is how long the medicine lasts in the body and how quickly it works: short-acting, intermediate-acting, or long-acting.

How to use

PROCAINE PENICILLIN, PROCAINE BENZYL PENICILLIN (intermediate-acting)
Inject only in the muscle (IM), not in the vein (IV).

- Give 25,000 to 50,000 units (U, or IU) per kg per day. Do not give more than 4,800,000 units. If you cannot weigh the person, dose by age:
 - 2 months to 3 years:** inject 150,000 units, 1 time a day for 10 to 15 days.
 - 4 to 7 years:** inject 300,000 units, 1 time a day for 10 to 15 days.
 - 8 to 12 years:** inject 600,000 units, 1 time a day for 10 to 15 days.
 - Over 12 years:** inject 600,000 to 4,800,000 units, 1 time a day for 10 to 15 days.

Do not give to babies under 2 months unless no other penicillin or ampicillin is available. If this is your only choice, inject 50,000 units, 1 time a day for 10 to 15 days.

For very severe infections in any age, double the above dose. Do not give more than 4,800,000 units in a day.

For a wound likely to be infected with tetanus, along with medicines to prevent tetanus (page 74), antibiotics are sometimes given. For example give the above dose for 7 to 10 days OR give the above dose for 2 days, then switch to penicillin by mouth (penicillin V) for 5 to 8 more days.

Cloxacillin

Cloxacillin is a form of penicillin, and can sometimes be used for infections that have become resistant to penicillin, such as sores on the skin with pus, and bone infections. If you do not have cloxacillin, dicloxacillin (page 66) can be used instead.

Side effects

Nausea, vomiting, diarrhea, fever, and joint pain.

Important

- Do not give if the person is allergic to penicillin.

How to use

For most infections

→ For young children give 25 to 50 mg per kg, divided into 4 doses a day. For adults give 50 to 100 mg per kg, divided into 4 doses a day. If you cannot weigh the person, dose by age:

Under 2 years: give 75 mg, 4 times a day.

2 to 10 years: give 125 mg, 4 times a day.

Over 10 years: give 250 to 500 mg, 4 times a day.

Double these amounts for severe infections.

For knife or gunshot wound, give the dose above for 10 to 14 days. If the wound is dirty or in the abdomen, also give metronidazole (page 70).

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. If the wound is very dirty, also give metronidazole (page 70).

Dicloxacillin

Dicloxacillin is a form of penicillin, and can sometimes be used for infections that have become resistant to penicillin. If you do not have dicloxacillin, cloxacillin (page 65) can be used instead.

Side effects

Nausea, stomach pain, loss of appetite.

Important

- Do not give if the person is allergic to penicillin. Do not give to newborns.
- Stop taking if you begin to have dark urine, gray colored stools or jaundice (yellow skin and eyes).

How to use

Give with a full glass of water. Give 1 hour before eating, or 2 hours after eating.

→ For children under 40 kg, give 12.5 to 25 mg per kg, divided into 4 doses a day. If you cannot weigh the person, dose by age:

Under 1 year: give 20 mg by mouth, 4 times a day.

1 to 5 years: give 30 mg by mouth, 4 times a day.

6 to 12 years: give 80 mg by mouth, 4 times a day.

Over 12 years: give 125 to 250 mg by mouth, 4 times a day.

For an infected wound, give the dose above for 5 to 7 days. If the wound is very dirty, also give metronidazole (page 70).

For a burn that is infected, give the dose above for 5 to 7 days. If it is a deep burn, or the person has a fever, give the dose above for 10 to 14 days.

Other antibiotics

Erythromycin

Erythromycin works against many of the same infections as penicillin and can be used by those who are allergic to penicillins. For many infections, it can also be used in place of tetracycline. It can also be used for diphtheria and pertussis (whooping cough).

Side effects



Erythromycin often causes nausea and diarrhea, especially in children. Do not use for more than 2 weeks as it may cause jaundice.

How to use



- Give 30 to 50 mg per kg each day, divided into 2 to 4 doses a day. If you cannot weigh the person, dose by age:

Newborns up to 1 month old: give 62 mg, 3 times a day for 7 to 10 days.

1 month to 2 years: give 125 mg, 3 or 4 times a day for 7 to 10 days.

2 to 8 years: give 250 mg, 3 or 4 times a day for 7 to 10 days.

Over 8 years: give 250 to 500 mg, 4 times a day for 7 to 10 days.

For severe infections, double the doses above.

Tetracycline and Doxycycline

Tetracycline and doxycycline are broad-spectrum antibiotics and fight many different kinds of bacteria. They work well when given by mouth (and are very painful when injected, so they should not be given that way). There are more infections that are now resistant to these medicines so they are not used as much as they once were, but they are still useful for fighting some infections.

Doxycycline and tetracycline can be used interchangeably. But doxycycline is usually a better choice because less is needed each day and it has fewer side effects.

Side effects



Heartburn, stomach cramps, diarrhea, and yeast infections are common.

Important

- Pregnant women should not take these medicines, as they can damage or stain the baby's teeth and bones. For the same reason, children under 8 years old should take them only when there is no other effective antibiotic, and for short periods only. You can usually use erythromycin instead.
- Some people may develop a skin rash or get easily sunburned after spending time in the sun while taking these medicines, so stay out of the sun or wear a large hat.

How to use

TETRACYCLINE

Avoid milk, iron pills, and antacids for 2 hours before or after taking tetracycline. They will make the medicine less effective.

Take tetracycline on an empty stomach, at least 1 hour before or 2 hours after meals.

For most infections

- Give 25 to 50 mg per kg each day, divided into 4 doses a day. If you cannot weigh the person, dose by age:
 - 8 to 12 years:** give 125 mg, 4 times a day for 7 to 10 days.
 - Over 12 years:** give 250 to 500 mg, 4 times a day for 7 to 10 days.

DOXYCYCLINE

Doxycycline is taken twice a day (instead of 4 times a day like tetracycline).

Avoid milk, iron pills, and antacids for 2 hours before or after taking doxycycline. They will make the medicine less effective.

Take doxycycline on an empty stomach, at least 1 hour before or 2 hours after meals.

For most infections

- Give 2 mg per kg in each dose, but do not give more than 100 mg per dose or 200 mg a day. Give once or twice a day. Or dose by age:
 - 8 to 12 years:** give 50 mg twice a day, for 7 to 10 days.
 - Over 12 years:** give 100 mg twice a day, for 7 to 10 days.

For animal bites, give the dose above for 3 to 5 days. Also give metronidazole (page 70) or clindamycin (page 69).

Cotrimoxazole, sulfamethoxazole with trimethoprim, TMP-SMX

Cotrimoxazole, a combination of 2 antibiotics, is inexpensive and fights a wide range of infections. It is an important medicine for people with HIV and can prevent the many infections that come as a result of HIV infection. See HIV and AIDS (in development).

Important

Avoid giving cotrimoxazole to babies less than 6 weeks old and to women in the last 3 months of pregnancy. Allergy to this medicine is common. Signs of allergic reaction are fever, difficulty breathing, or rash. Stop giving cotrimoxazole if a rash develops or if you think there may be an allergy.

How to use

Cotrimoxazole comes in different strengths of each of the 2 medicines it contains. So it may say 200/40 (meaning 200 mg sulfamethoxazole and 40 mg trimethoprim) or 400/80 or 800/160. Sometimes a dose is described only in terms of the amount of trimethoprim (the second number).

For most infections

- ➔ **6 weeks to 5 months:** give sulfamethoxazole 100 mg + trimethoprim 20 mg, 2 times a day for 5 days.
- ➔ **6 months to 5 years:** give sulfamethoxazole 200 mg + trimethoprim 40 mg, 2 times a day for 5 days.
- ➔ **6 to 12 years:** give sulfamethoxazole 400 mg + trimethoprim 80 mg, 2 times a day for 5 days.
- ➔ **Over 12 years:** give sulfamethoxazole 800 mg + trimethoprim 160 mg, 2 times a day for 5 days.

For animal bites, give the amount above for 3 to 5 days. Also give metronidazole (page 70) or clindamycin (page 69).

Clindamycin

Clindamycin is another antibiotic used to treat many kinds of bacterial infections. It is especially useful for treating infections that have become resistant to penicillin such as skin infections and abscesses.

Important

If you develop diarrhea that is watery or bloody while taking clindamycin, stop taking it immediately. This can be a sign of dangerous infection caused by the antibiotic. Because the drug can pass through breast milk and harm a baby, avoid giving to a breastfeeding woman.

How to use

Give clindamycin by mouth.

→ **Under 3 years:** give 37.5 to 75 mg, 3 times a day.

3 to 7 years: give 75 to 150 mg, 3 times a day.

8 to 12 years: give 150 to 300 mg, 3 times a day.

Over 12 years: give 150 to 450 mg, 3 times a day.

For animal bites, give the dose above for 3 to 5 days. Also give another medicine such as doxycycline (page 67), cotrimoxazole (page 69) OR penicillin V (page 64).

For an infected wound, give the dose above for 5 to 7 days.

For a burn that is infected, give the dose above for 5 to 7 days. If it is a deep burn, or the person also has a fever, give the dose above for 10 to 14 days.

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. If the wound is very dirty, also give ciprofloxacin (page 71).

For knife or gunshot wound, give the dose above for 10 to 14 days.

Metronidazole

Metronidazole is effective at fighting certain bacteria and infections, used by itself or in combination with other antibiotics.

Side effects

Nausea, cramps, and diarrhea are common. Taking with food may help. Sometimes it causes a metallic taste in the mouth or a headache.

Important

Do not give metronidazole in the first 3 months of pregnancy because it may cause birth defects. Also avoid giving metronidazole later in pregnancy and while breastfeeding unless it is the only effective medicine and is definitely needed. Do not drink alcohol while taking metronidazole or until 2 days after you finish taking it. Drinking alcohol while taking metronidazole causes severe nausea. Do not use metronidazole if you have liver problems.

How to use

→ Give 30 mg per kg, divided into 4 doses a day. If you cannot weigh the person, dose by age:

Under 1 year: give 37 mg, 4 times a day.

1 to 5 years: give 75 mg, 4 times a day.

6 to 12 years: give 150 mg, 4 times a day.

Over 12 years: Give 500 mg, 3 or 4 times a day. Do not give more than 4 g in 24 hours.

For an infected wound, give the dose above for 5 to 7 days. Also give dicloxacillin (page 66) OR cephalaxin (page 72).

For a wound likely to be infected with tetanus, along with medicines to prevent tetanus (page 74), antibiotics are sometimes given. For example give the dose above for 7 to 10 days.

For animal bites, give the dose above for 3 to 5 days. Also give another medicine such as doxycycline (page 68), cotrimoxazole (page 69), OR penicillin V (page 64).

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. Also give ceftriaxone (page 72), cephalaxin (page 72) OR cloxacillin (page 65).

Ciprofloxacin

Ciprofloxacin is a broad spectrum antibiotic of the quinolone family. It works against a lot of different infections of the skin, bones, digestive tract, and urinary tract (bladder and kidneys). There are more infections becoming resistant to ciprofloxacin depending on where you live. Only use it against the infections for which it is specifically recommended in your area. It is not a good antibiotic for children.

Side effects

Nausea, diarrhea, vomiting, headache, dizziness, rash, or yeast infections.

Important

- Do not use if you are pregnant or breastfeeding. Do not take with dairy products such as milk or cheese.
- Rarely, ciprofloxacin damages the tendons. Except for a few specific situations, it should not be given to children under 16 because their tendons are still developing. If you have pain in your calves when taking this medicine, stop taking it immediately.

How to use

For most infections

- ➔ Give 250 to 750 mg, twice a day until 24 hours after signs of infection are gone.

For sepsis, give the dose above for 2 to 3 days after signs of infection are gone. Also give clindamycin (page 69).

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. Also give clindamycin (page 69).

For a burn that is infected, give the dose above for 5 to 7 days. If it is a deep burn, or the person also has a fever, give the dose above for 10 to 14 days.

Ceftriaxone

Ceftriaxone is in the cephalosporin antibiotic family. Cephalosporins are antibiotics that work against many kinds of bacteria. They are often expensive and not widely available. However, they generally have fewer risks and side effects than many other antibiotics and can be useful in treating certain serious diseases.

Ceftriaxone is used against serious infections including sepsis and meningitis, and for infections resistant to penicillin. Only use ceftriaxone to treat the specific infections for which it is recommended in your area.

Ceftriaxone is especially useful for gonorrhea, including gonorrhea infection of the newborn's eyes but otherwise should not be given to newborns under 1 week old and should be avoided in babies under 1 month old.

Important

Do not give this medicine to someone who is allergic to other cephalosporin antibiotics.

Do not give to a baby less than 1 week old, except as treatment for gonorrhea in the eyes. Do not use if there is jaundice.

How to use

Ceftriaxone cannot be taken by mouth. When injecting, put the needle deep in the muscle. It can be painful to inject, so mix with 1% lidocaine (page 88) if you know how.

- Give 50 to 100 mg per kg each day, divided into 2 doses a day. If you cannot weigh the person, dose by age:
 - 1 month to 3 months:** inject 150 mg, twice a day.
 - 3 months to 1 year:** inject 250 mg, twice a day.
 - 2 to 4 years:** inject 400 mg, twice a day.
 - 5 to 12 years:** inject 625 mg, twice a day.
 - Over 12 years:** inject 1 to 2 grams, once a day. Do not give more than 4 grams in 24 hours.

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. If the wound is dirty, also give metronidazole (page 70).

For sepsis, give the dose above until 2 to 3 days after signs of infection are gone. If the wound is dirty, or there is no improvement 24 hours after starting ceftriaxone, also give metronidazole (page 70).

Cephalexin

Cephalexin is in the cephalosporin antibiotic family. Cephalosporins are powerful antibiotics that work against many kinds of bacteria. They are often expensive and not widely available. However, they generally have fewer risks and side effects than many other antibiotics and can be useful in treating certain serious diseases.

Side effects

Diarrhea that is watery or bloody, fever, sore throat, headache, red skin rash with blistering or peeling, dark colored urine, confusion or weakness.

Important

Do not give this medicine to someone who is allergic to other cephalosporin antibiotics.

How to use

- Give 50 mg per kg each day, divided into 4 doses a day. Do not give more than 4000 mg in 24 hours. If you cannot weigh the person, dose by age:

Under 6 months: give 100 mg, 4 times a day.

6 months to 2 years: give 125 mg, 4 times a day.

3 to 5 years: give 250 mg, 4 times a day.

6 to 12 years: give 375 mg, 4 times a day.

Over 12 years: give 500 mg, 4 times a day.

For an infected wound, give the dose above for 5 to 7 days. If the wound is very dirty, also give metronidazole (page 70).

For a burn that is infected, give the dose above for 5 to 7 days. If it is a deep burn, or the person has a fever, give the dose above for 10 to 14 days.

For a bone that has broken through the skin (open fracture), give the dose above for 5 to 7 days. If the wound is very dirty, also give metronidazole (page 70).

For knife or gunshot wound, give the dose above for 10 to 14 days. If the wound is dirty or in the abdomen, also give metronidazole (page 70).

Gentamicin

Gentamicin is a very strong antibiotic of the aminoglycoside family. It can only be given by injection or IV (in the vein). This drug can damage the kidneys and the hearing, so it should only be used in emergencies.

Important

Gentamicin must be given in the exactly correct dose. Giving too much can cause kidney damage or permanent deafness. It is best to dose by weight. And do not give gentamicin for more than 10 days.

How to use

Inject into the muscle or the vein.

For sepsis

- **6 months to 12 years:** inject 2.5 mg per kg, 3 times a day.

Over 12 years: inject 1 to 1.7 mg per kg, 3 times a day.

Medicines to Prevent Tetanus

Some wounds can cause tetanus (see page 21) unless the person has already had the necessary vaccinations. Antitetanus immunoglobulin and the tetanus vaccine are 2 medicines given by injection that prevent tetanus after a wound (page 75). One or both are needed depending on the seriousness of the wound and whether the person is up-to-date with tetanus vaccinations. Give the necessary injections as soon as possible. Do not wait for signs of tetanus.

A person is **up-to-date** with tetanus vaccines, when:

- They had all 6 doses (a series of 3 as a baby, and later at least 3 boosters).
- OR
- They had the first 3 doses and at least one booster within the last 10 years.

To know which injections to prevent tetanus are needed, you need to know if the person has been vaccinated against tetanus and when. Many people do not know if they have had these vaccines. If their vaccination history is unknown, give medicines as if they have not been vaccinated.

- **Give the vaccine against tetanus AND give antitetanus immunoglobulin:**
 - For a deep or dirty wound when the most recent tetanus vaccine was more than 5 years ago or vaccination history is unknown.
- **Give only the vaccine against tetanus:**
 - For a deep or dirty wound when the most recent tetanus vaccine was 5 to 10 years ago.
 - For a minor and clean wound when the person is not up-to-date with their tetanus vaccines.
- **No injection is needed:**
 - For a deep or dirty wound when the most recent tetanus vaccine was in the last 5 years.
 - For a minor and clean wound when the person is up-to-date with their tetanus vaccines.

But if the person has HIV or another illness that lowers their immunity, give antitetanus immunoglobulin for any wound, even a minor one. If they are not up-to-date with the tetanus vaccine, they will need the tetanus vaccine too.

Tetanus vaccine

- Vaccines to prevent tetanus often come combined with other vaccines. Abbreviations for such vaccines include: DPT, Tdap, Td, Dt and others.
- The DPT vaccine protects against diphtheria, pertussis and tetanus and by 6 months old, babies need a series of 3 injections of this vaccine.
- Older children get 3 booster injections of DTP or another combination vaccine to prevent diphtheria and tetanus (such as Td or Dt).
- Receiving all 6 doses of these vaccines against tetanus (the series of 3 and then 3 boosters) gives protection from tetanus for decades.
- People who did not receive all 6 doses or did not have one within the last 10 years may need a booster vaccine.
- Giving the vaccine against tetanus to a pregnant woman whose vaccinations are not up-to-date helps protect both the woman and her newborn baby from tetanus.

Antitetanus immunoglobulin human (Tetanus immune globulin)

If a person is not up-to-date with their tetanus vaccination (the series of 3 injections, and at least 3 boosters, or one booster within the past 10 years), then they should be given antitetanus immunoglobulin as soon as possible after getting a wound that might cause tetanus. If giving both the tetanus vaccine and the antitetanus immunoglobulin at the same time, use separate needles and inject in different places on the body.

Side effects

There may be pain and tenderness where the injection was given.

Important

Antitetanus immunoglobulin can cause a severe allergic reaction for some people. Always have epinephrine (adrenaline) available in case of an allergic reaction (page 79).

Some live virus vaccines, including those preventing measles, rubella, and tuberculosis, should not be given for 3 months after someone has received antitetanus immunoglobulin because it may make the other vaccines less effective.

How to use

Inject the medicine deep into the muscle.

For a wound less than 24 hours old

- ➔ Inject 250 units one time only.

For a wound more than 24 hours old, or a wound that is very likely to be infected with tetanus

- ➔ Inject 500 units one time only.

Also give an antibiotic such as metronidazole (page 70) OR penicillin G (page 65).

Medicines for Animal Bites

Clean animal bites well with soap and water. Give antibiotics because animal bites are especially likely to become infected.

- Amoxicillin with clavulanic acid (page 64) is the best choice for treating animal bites.
- If you do not have amoxicillin with clavulanic acid, use 2 antibiotics:
 Give one of these: doxycycline (page 67), cotrimoxazole (page 69), or penicillin V (page 64)
 AND, one of these: metronidazole (page 70) or clindamycin (page 69).

If the bite was from a dog, a bat, or another animal that could have rabies, also give rabies vaccine and rabies immunoglobulin if needed (see below).

Rabies vaccine and rabies immunoglobulin

Where there are animals with rabies, any animal bite or scratch breaking the skin will need thorough cleaning with soap and water for at least 15 minutes, a series of rabies vaccine injections, and, if the rabies risk is high, also an injection of rabies immunoglobulin (see Animal bites, page 17). Even if there is no rabies immunoglobulin available, washing the skin thoroughly and giving the series of rabies vaccine can prevent rabies.

Using rabies vaccine

Inject the complete vial of vaccine (either 0.5 ml or 1 ml depending on the vaccine manufacturer) into the upper arm muscle on the day of the bite, and then again on days 3, and 7. Then, a fourth injection is given between day 14 (2 weeks) and 28 (4 weeks) after the bite. For a child 2 years or younger, give injections in the upper thigh.

Using rabies immunoglobulin

There are two forms of rabies immunoglobulin, one made from human serum (HRIG) and one made from horse serum (ERIG). HRIG is safer.

When giving rabies immunoglobulin, also give rabies vaccine, but use a different clean needle and inject in a different place on the body.

Important

Rabies immunoglobulin can cause a severe allergic reaction for some people. Always have epinephrine (adrenaline) available in case of an allergic reaction (page 79).

How to use

Inject rabies immunoglobulin in and around the cleaned wound. If there are several wounds and the amount of rabies immunoglobulin you have is not enough to inject into each one, add buffered saline solution to double the amount of liquid. Then the person will still receive the correct dose and all wounds will receive some medicine.

If using Human Rabies Immune Globulin (HRIG)

- Inject 20 units per kg one time.

If using Equine Rabies Immune Globulin (ERIG)

- Inject 40 units per kg one time.

Medicines for Burns

Burns can be very painful. Give strong pain medicines such as codeine (page 86) OR morphine (page 87), especially before cleaning or changing the dressing on a burn.

Burns are very likely to get infected, so give an antibiotic such as dicloxacillin (page 66), clindamycin (page 69), cephalexin (page 72), OR ciprofloxacin (page 71) if there are any signs of infection.

As the burn heals, give an antihistamine like chlorpheniramine (below) OR diphenhydramine (page 78) to calm the itching.

Give a tetanus vaccine if the person's tetanus vaccination is not up-to-date (see page 74).

If the person was in a fire and inhaled a lot of smoke, salbutamol can help them to breathe more easily (see page 79).

Medicines for Allergy or Itching: Antihistamines

Itching, sneezing, and rashes caused by allergy can usually be treated with antihistamines. Any antihistamine works about as well as any other. So if you do not have chlorpheniramine or diphenhydramine, use another antihistamine in the right dose (this will vary for each drug). All antihistamines make people drowsy, but some more than others.

These drugs are not helpful for the common cold.

Antihistamines should be avoided during pregnancy. If they must be given, choose a "first generation" antihistamine such as chlorpheniramine or diphenhydramine, and give with plenty of water.

For a severe allergic reaction where there is difficulty breathing, epinephrine (adrenaline) is needed as well as antihistamines (page 79).

Chlorpheniramine, chlorphenamine

Chlorpheniramine is an antihistamine that reduces itching, sneezing, rashes, and other problems caused by allergies. It can be used after an insect bite, a mild allergy to a food or a medicine, or for "hay fever" (sneezing and itchy eyes from pollen in the air).

Side effects

Sleepiness (but this is less likely than with other antihistamines).

Important

Do not give to pregnant women unless necessary. Do not give during an asthma attack.

How to use

- **1 to 2 years:** give 1 mg, 2 times a day until the child feels better.
- 3 to 5 years:** give 1 mg, every 4 to 6 hours until the child feels better.
- 6 to 12 years:** give 2 mg, every 4 to 6 hours until the person feels better.
- Over 12 years:** give 4 mg, every 4 to 6 hours until the person feels better.

For severe allergic reaction

First inject epinephrine (see page 79). Follow with chlorpheniramine by mouth in the doses listed above to help prevent the reaction from coming back when the epinephrine wears off.

Diphenhydramine

Diphenhydramine is an antihistamine that reduces itching, sneezing, rashes, and other problems caused by allergies. It can be used after an insect bite, a mild food or drug allergy, or for "hay fever" (sneezing and itchy eyes from pollen in the air).

Side effects

Sleepiness.

Important

- Diphenhydramine may cause dizziness, sleepiness, or blurred vision. Do not drive or operate machinery if using this medicine. Drinking alcohol may increase the sleepiness caused by diphenhydramine.
- Do not give to newborn babies or women who are breastfeeding. It is best not to give diphenhydramine to pregnant women unless necessary.
- Do not give during an asthma attack.

How to use

The dose is the same for giving diphenhydramine by mouth or as an injection into the muscle.

- **2 to 5 years:** give 6 mg every 4 to 6 hours. Do not give more than 37 mg per day.
- 6 to 11 years:** give 12 to 25 mg every 4 to 6 hours. Do not give more than 150 mg per day.
- Over 12 years:** give 25 to 50 mg every 4 to 6 hours. Do not give more than 400 mg per day.

For severe allergic reaction

First inject epinephrine (see page 79). Following with diphenhydramine in the doses below will help prevent the reaction from coming back when the epinephrine wears off.

- **2 to 11 years:** give 1 to 2 mg per kg, every 6 hours. If you cannot weigh the child, use the doses by age listed above, and give the larger amount. Do not give more than 50 mg at one time, or 300 mg per day.
- Over 12 years:** give 25 to 50 mg, every 2 to 4 hours. Do not give more than 100 mg in 4 hours or 400 mg per day.

Epinephrine (adrenaline)

Epinephrine is used for severe allergic reaction (anaphylaxis) to medicines, foods, insect stings or bites, or other things that cause a severe allergic reaction. It helps reverse the effects such as difficulty breathing, wheezing, severe skin itching, and hives.

Side effects

Fear, restlessness, nervousness, tension, headaches, dizziness, increased heart rate.

Important

Epinephrine often comes in ampules of 1 mg per 1 ml liquid. Epinephrine is also available in preloaded autoinjectors, but these come in different amounts. Be sure to read to see how much epinephrine is in your autoinjector to make sure you are giving the correct amount.

How to use

For severe allergic reaction

- Inject into the muscle in the outer part of the mid-thigh.

1 to 5 years: inject $\frac{1}{4}$ mg (0.25 mg).

6 to 12 years: inject $\frac{1}{3}$ mg (0.33 mg).

Over 12 years: inject $\frac{1}{2}$ mg (0.5 mg).

If needed, you can give a second dose in 5 to 15 minutes, and a third dose in 5 to 15 minutes after that. Do not give more than 3 doses.

After giving epinephrine, give an antihistamine such as chlorpheniramine (page 77) or diphenhydramine (page 78). This will help prevent the reaction from coming back when the epinephrine wears off.

Salbutamol (albuterol)

Salbutamol relaxes the muscles in the airway to increase air flow to the lungs. It is used to treat wheezing or shortness of breath from asthma or inhaling a lot of smoke from a fire.

Side effects

Trembling, nervousness, dizziness, fast heartbeat, and headaches.

How to use

- Give 2 puffs from an inhaler (200 micrograms) every 4 to 6 hours as needed. Use with a spacer for better effects.

It is OK to give more than the amounts listed above if the person feels they need it.

Medicines for Heart Attack

If you suspect someone is having a heart attack, give 1 tablet of aspirin right away (300 to 325 mg). Ask the person to chew it and swallow it with water. Even if you are not sure the person is having a heart attack, aspirin will do no harm. On the way to a hospital, give nitroglycerin if you have it.

You can also give morphine to help with the pain and fear (page 87).

Nitroglycerin (Glyceryl trinitrate)

Nitroglycerin is used to treat chest pain from a heart attack. It helps to widen the blood vessels making it easier for the heart to pump blood.

Important

Do not give nitroglycerin to someone with low blood pressure or who has taken sildenafil (*Viagra*) in the last 24 hours. This combination of medicines can cause blood pressure to drop dangerously low, and can be deadly.

Side effects

May cause severe headache, feeling hot, or dizziness.

How to use

The person should sit or lie down, not stand up, in case they get dizzy.

- Give $\frac{1}{2}$ mg (0.5 mg) tablet dissolved under the tongue, no more than 3 times, waiting 5 minutes between each tablet. If the chest pain and other signs go away, another tablet is not needed. Do not chew or swallow nitroglycerin tablets. As the tablet dissolves under the tongue, it tingles or even burns a little.

Medicines for Poisoning

Activated charcoal

Activated charcoal is a powder used to treat some poisonings such as certain pesticides and herbicides that have been swallowed. Activated charcoal prevents the poison from being absorbed by the body, so give it as soon as possible after being poisoned. Activated charcoal will not harm a person who was not poisoned, so give it even if you are not sure.

If you do not have activated charcoal, you can use powdered charcoal from burnt wood or even burnt bread or tortilla. Mix 1 tablespoon of powdered charcoal with warm water in a large glass. This is not as good as activated charcoal, but it still works.

Never use charcoal briquettes—they are poison!

Activated charcoal is **not** helpful for poisoning from:

- **corrosives** (such as ammonia, batteries, acids, drain cleaner, caustic soda, lye)
- **hydrocarbons** (such as gasoline, kerosene, turpentine, paint thinner, phenol, carbolic acid, camphor, pine oil)
- **cyanide** (used in mining, factory work, animal hide hair removal, rat poison)
- **ethanol**
- **iron** (iron tablets, multivitamins or prenatal vitamins)
- **lithium** (found in medication to treat bipolar mental illness)
- **methanol** (found in varnish, paint thinner, fuel additives for cars)
- **mineral acids**
- **organic solvents** (found in paint thinner, glue solvents, nail polish remover, spot removers)

Side effects



Can cause black stools, vomiting, constipation, or diarrhea.

How to use

- Give as soon as possible after poisoning (or possible poisoning) with a full glass of water. The dose can be given again in 4 hours.

Under 1 year: give 10 to 25 g.

1 year to 12 years: give 25 to 50 g.

Over 12 years: give 50 g.

Atropine

Atropine is used to treat poisoning from certain pesticides, insecticides, or nerve gases. Only use atropine if the label on the pesticide container says to use atropine, or if it says the pesticide is a "cholinesterase inhibitor." The amount of atropine needed depends on how severe the poisoning is. Usually, a poisoning from a carbamate requires less medicine than if the poisoning is from an organophosphate.

Side effects



Sleepiness, feeling lightheaded, headaches, changes in thinking, and hard stools.

Important

Keep the person cool after giving atropine.

How to use



- Inject into the muscle.

Under 2 years: inject 0.05 mg per kg, every 5 to 10 minutes.

2 to 10 years: inject 1 mg, every 5 to 10 minutes.

Over 10 years: inject 2 mg, every 5 to 10 minutes.

Stop giving injections when the skin becomes flushed and dry, and the pupils get bigger. If the poisoning is severe, double the amounts of atropine listed above.

Deferoxamine

Deferoxamine helps treat iron poisoning by removing iron from the blood.

Side effects



Blurred vision and changes in thinking.

Important

Do not give to someone with kidney disease or if the person cannot urinate. Do not give to children under 3 years old.

How to use



- Inject slowly into the muscle. Inject 50 mg per kg every 6 hours. Do not give more than 6 g in a day. If you cannot weigh the person, dose by age:
 - 3 to 5 years:** slowly inject 500 mg, every 6 hours, for 1 day (4 times).
 - 5 to 12 years:** slowly inject 1000 mg, every 6 hours, for 1 day (4 times).
 - Over 12 years:** slowly inject every 6 hours for 1 day (4 times) as follows: The first 2 times give 2000 mg, then use half the dose, 1000 mg, for the next 2 times.

Acetylcysteine

Give acetylcysteine as soon as possible after taking too much paracetamol or acetaminophen. Too much paracetamol or acetaminophen is over 7,000 mg for an adult, and over 140 mg per kg for a child.

Acetylcysteine has a strong smell. Mixing it with juice helps the person tolerate it.

How to use



For paracetamol (acetaminophen) overdose

- Give the first dose of acetylcysteine at 140 mg per kg by mouth. Wait 4 hours then give half this amount for the second dose (70 mg per kg by mouth). Continue giving the dose of 70 mg per kg every 4 hours, 16 more times. This makes a total of 18 doses during a 3-day period (72 hours). If the person vomits within 1 hour of taking the medicine, give the dose again.

Naloxone

Naloxone is used to treat an overdose from opioids such as morphine, heroin, fentanyl, methadone, opium, oxycodone, codeine, and other strong pain medicines. Give naloxone until the person is breathing well on their own. The treatment can wear off, so you may need to give another dose in 20 minutes if the person starts to have difficulty breathing again.

Side effects



Nausea, vomiting, and sweating. Extreme discomfort.

How to use



- **Under 5 years or child weighs less than 20 kg:** inject 0.1 mg per kg into the muscle every 2 to 3 minutes as needed, but do not give more than 2 mg in total.
- Over 5 years or weighs more than 20 kg:** inject ½ to 2 mg in the muscle. If needed, repeat the dose every 2 to 3 minutes, but do not give more than 10 mg in total.

Sodium nitrite

Sodium nitrite is used to treat cyanide poisoning together with sodium thiosulfate. It must be injected into the vein. Only do this if you know how.

How to use



- Slowly inject sodium nitrite into the vein over 5 to 20 minutes.
- Under 12 years:** inject 4 to 10 mg per kg into the vein. Do not give more than 300 mg.
- Over 12 years:** inject 300 mg into the vein.

Follow with an injection of sodium thiosulfate. See below for doses.

Sodium thiosulfate

Sodium thiosulfate is used to treat cyanide poisoning along with an injection of sodium nitrite. It must be injected into the vein. Only do this if you know how.

How to use



- Slowly inject sodium thiosulfate into the vein over 10 minutes.
- Under 12 years:** inject 400 mg per kg into the vein.
- Over 12 years:** inject 12.5 g into the vein.

Medicines for Pain

Medicines for mild pain and lowering fever include paracetamol (the safest and best medicine to use for children), aspirin, and ibuprofen. Aspirin and ibuprofen also reduce inflammation (swelling). Reducing swelling will calm pain and help heal injuries such as a twisted or sprained ankle. For children with fevers and viral infections, give paracetamol and avoid aspirin.

Do not give more than the recommended dose of these medicines. Too much aspirin or ibuprofen can cause stomach ulcers. Too much paracetamol can be poisonous. For high fever or very strong pain, avoid using too much of any one pain medicine by using both paracetamol and ibuprofen in the correct doses and intervals.

Paracetamol, acetaminophen

Paracetamol is a good, affordable medicine for fever and mild pain.

Important

Do not take more than the recommended amount. Too much is poisonous to the liver and can kill. Keep this medicine out of the reach of children, especially if you have it as a sweetened syrup.

Cold medicines often contain paracetamol, so do not give them if you are also giving paracetamol or you may give too much.

How to use

→ Give 10 to 15 mg per kg, every 4 to 6 hours. Do not give more than 5 times in 24 hours. If you cannot weigh the person, dose by age:

Under 1 year: give 62 mg (half of $\frac{1}{4}$ of a 500 mg tablet), every 4 to 6 hours.

1 to 2 years: give 125 mg ($\frac{1}{4}$ of a 500 mg tablet), every 4 to 6 hours.

3 to 7 years: give 250 mg ($\frac{1}{2}$ of a 500 mg tablet), every 4 to 6 hours.

8 to 12 years: give 375 mg ($\frac{3}{4}$ of a 500 mg tablet), every 4 to 6 hours.

Over 12 years: give 500 mg to 1000 mg, every 4 to 6 hours, but do not give more than 4000 mg in a day.

Ibuprofen

Ibuprofen relieves muscle pain, joint pain, and headache, and lowers fever.

Side effects

Ibuprofen can cause a stomachache, but taking it with milk or food lessens that problem.

Important

Do not take ibuprofen if you are allergic to aspirin. Some people who are allergic to one are also allergic to the other. Do not give ibuprofen for stomach pain or indigestion. Ibuprofen is acidic and may make the problem worse. For the same reason, people with stomach ulcers should never use ibuprofen. Do not give ibuprofen to babies younger than 6 months, and do not give to pregnant women in their last 3 months of pregnancy.

How to use

- Give 5 to 10 mg per kg, every 6 to 8 hours. If you cannot weigh the person, dose by age.
 - 6 months to 12 months:** give 50 mg, every 6 to 8 hours.
 - 1 to 2 years:** give 75 mg, every 6 to 8 hours.
 - 2 to 3 years:** give 100 mg, every 6 to 8 hours.
 - 4 to 5 years:** give 150 mg, every 6 to 8 hours.
 - 6 to 8 years:** give 200 mg, every 6 to 8 hours.
 - 9 to 10 years:** give 250 mg, every 6 to 8 hours.
 - 11 years:** give 300 mg, every 6 to 8 hours.
 - Over 12 years:** give 200 to 400 mg, every 4 to 6 hours.

Do not give more than 40 mg per kg in a day. Do not give more than 4 doses a day, and do not give for more than 10 consecutive days.

Aspirin (acetylsalicylic acid)

Aspirin is a good, affordable medicine for fever and mild pain.

Side effects

Aspirin can cause stomach pain or heartburn. To avoid this, take aspirin with milk, a little bicarbonate of soda, or a lot of water—or together with meals.

Important

- Do not give aspirin for stomach pain or indigestion. Aspirin is acidic and may make the problem worse. For the same reason, people with stomach ulcers should never use aspirin.
- Do not give more than 1 dose of aspirin to a dehydrated person until he begins to urinate well.
- It is better not to give aspirin to children under 12 years and especially not to babies (paracetamol is safer) or to someone with asthma (this may bring on an attack). Do not give to children with flu signs, as this can cause problems.
- Keep aspirin where children cannot reach it. Large amounts can poison them.
- Do not give to pregnant women.

How to use

- **1 to 2 years:** give 75 mg, every 6 hours.
- 3 to 7 years:** give 150 mg, every 6 hours.
- 8 to 12 years:** give 300 mg, every 6 hours.
- Over 12 years:** give 300 to 600 mg, every 4 to 6 hours.

Do not give more than 2400 mg a day. Do not give to children more than 4 times a day.

For heart attack

- Give 300 to 325 mg by mouth immediately. Chew it up and swallow it.

Codeine (codeine sulfate)

Codeine is a medicine for pain in the opiate family. It is used to treat severe pain. Only use codeine when milder pain medicines do not work.

Side effects

May cause constipation (difficulty passing stools) and temporary inability to pass urine. May also cause nausea, vomiting, itching, and headaches.

Important

- Codeine is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not drink alcohol while using codeine as it can cause dangerous side effects and even death.
- Codeine can affect your thinking and reactions while taking it. Be careful when driving or doing other things that require you to be alert.
- Reduce the dose over time to stop taking it. Stopping all at once can cause uncomfortable withdrawal symptoms.
- Do not use codeine if you have ever had an allergic reaction to morphine.
- Do not use codeine if you are pregnant or breastfeeding.

How to use

- Give codeine along with food.
- 3 to 6 years:** give $\frac{1}{2}$ to 1 mg per kg by mouth, every 4 to 6 hours.
- 7 to 12 years:** give 15 to 30 mg by mouth, every 4 to 6 hours.
- Over 12 years:** give 15 to 60 mg by mouth, every 4 to 6 hours. Do not give more than 360 mg per day.

Morphine (morphine sulfate, morphine hydrochloride)

Morphine is medicine for pain in the opiate family used to treat moderate to severe pain.

Important

- Morphine is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not drink alcohol while using morphine as it can cause dangerous side effects and even death.
- Morphine can affect your thinking and reactions while taking it. Be careful when driving or doing other things that require you to be alert.
- Reduce the dose over time to stop taking it. Stopping all at once can cause uncomfortable withdrawal symptoms.
- Do not use morphine if you have ever had an allergic reaction to codeine.
- Do not use morphine if you are pregnant or breastfeeding.

How to use

For moderate to severe pain

- ➔ **Under 6 months:** give 0.1 mg per kg by mouth, every 3 to 4 hours. If you cannot weigh the baby, give 0.5 mg by mouth, every 3 to 4 hours.
- Over 6 months:** give 0.2 to 0.5 mg per kg by mouth, every 4 to 6 hours as needed. If you cannot weigh the person, dose by age:
 - 6 months to 1 year:** give 2 mg by mouth, every 4 to 6 hours.
 - 1 to 5 years:** give 3 mg by mouth, every 4 to 6 hours.
 - 6 to 12 years:** give 8 mg by mouth, every 4 to 6 hours.
 - Over 12 years:** give 10 to 30 mg by mouth, every 4 hours as needed.

For heart attack

- ➔ Slowly inject 10 mg into the muscle over 5 minutes (2 mg per minute). Inject another 5 to 10 mg if necessary.

Medicines for Numbing

Lidocaine, Lignocaine

Lidocaine is an anesthetic that can be injected around the edges of a wound to make the area numb so it will not hurt. This is useful before cleaning or stitching up a wound.

Lidocaine often comes in a 2% solution which is 20 mg of lidocaine per ml. If you have a different percent (%) solution, adjust the amount you use.

How to use

- Slowly inject into and under the skin around where you are going to cut or sew, at points about 1 cm apart. Inject the lidocaine close to the surface of the skin. Use about 1 ml of lidocaine for each 2 cm of skin. Do not use more than 20 ml.

Anti-anxiety Medicines

Diazepam

Diazepam can be used to relax muscles and calm the person. It can also be used to stop a single seizure. For people with ongoing seizures (epilepsy), use a different medicine, one that can be taken every day.

Side effects

Sleepiness.

Important

- Too much diazepam can slow down or stop breathing. **Do not give more than the recommended dose and do not give more than 2 doses.**
- Diazepam is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not give during pregnancy or breastfeeding unless the woman has a seizure (for example, due to eclampsia).
- Do not inject diazepam unless you have experience or training to do so. It is very difficult to give safely by injection. Instead, during a seizure, you can put it into the rectum (see page 89).

How to use

To relax muscles and calm a person

Give diazepam tablets by mouth 45 minutes before a painful procedure like pushing in a hernia or setting a bone.

- For children, give 0.2 to 0.3 mg per kg. If you cannot weigh the person, dose by age:
 - 2 to 6 years:** give 1 mg.
 - 7 to 12 years:** give 5 mg.
 - Over 12 years:** give 10 mg.

For a seizure

- Use the liquid solution for injection, or grind up 1 tablet and mix with water. Take the needle off a syringe, then draw up the medication and put it inside the rectum. Or use diazepam gel made for use in the rectum. Lay the person on her side and use the needle-less syringe to put the medicine deep into her rectum. Then hold her buttocks together for 10 minutes to keep the medicine in.
 - Under 7 years:** give 0.2 mg per kg, one time.
 - 7 to 12 years:** give 3 to 5 mg, one time.
 - Over 12 years:** give 5 to 10 mg, one time.

If the seizure is not controlled 15 minutes after giving the medicine, repeat the dose. Do not repeat more than once.

Lorazepam

Lorazepam is very similar to diazepam. It can be used to relax muscles and calm the person. It can also be used to stop a single seizure. For people with ongoing seizures (epilepsy), use a different medicine, one that can be taken every day.

Side effects



Sleepiness.

Important

- Too much lorazepam can slow down or stop breathing.
- Lorazepam is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not give during pregnancy or breastfeeding unless the woman has a seizure (for example, due to eclampsia).
- Do not inject lorazepam into a muscle or vein unless you have experience or training to do so. It is very difficult to give safely by injection. Instead, during a seizure, you can put it into the rectum (see Diazepam, for a seizure, above).

How to use

To relax muscles and calm a person

- Give lorazepam tablets by mouth 45 minutes before a painful procedure like setting a bone.
- 1 month to 12 years:** give 0.05 mg per kg, one time.
Over 12 years: give 1 to 2 mg, one time.

Problems with the Eyes and Seeing

Basic Care for Eyes

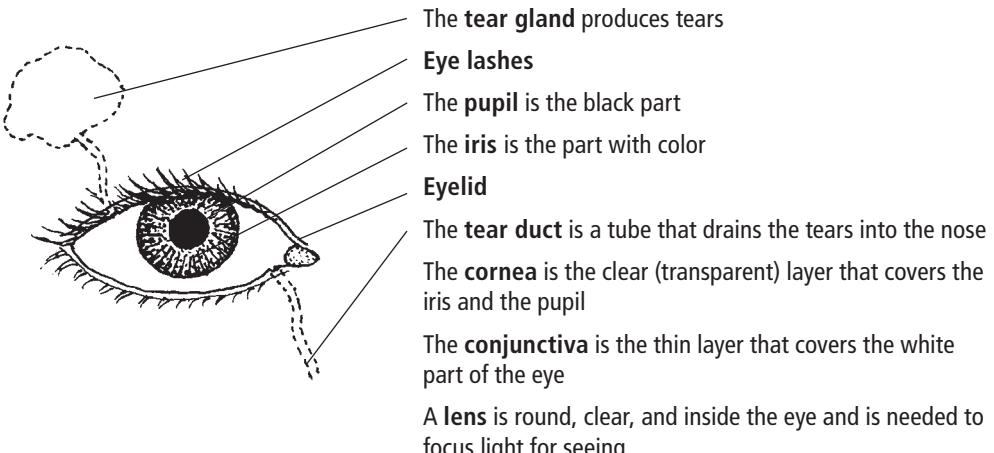
Keeping the face and the area around the eyes clean and protected from too much sun, wind, and injury will prevent many common problems that harm eyes or make them irritated, red, or painful. Eating nutritious food also prevents many eye problems.

Injuries can damage vision or cause blindness. Act quickly: go to the closest hospital or health clinic for a serious eye injury or for danger signs (see page 8). They can help you find an eye specialist if one is needed.

When far away or very close objects are difficult to see, the right kind of eyeglasses often helps people see much better. Because vision changes over time, you may need new eyeglasses every so often.

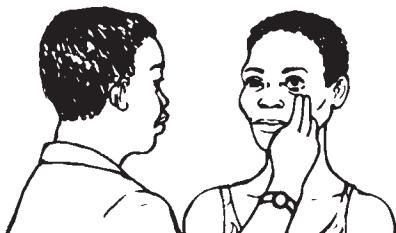
For adults, cataracts (page 19) and glaucoma (page 20) are common causes of vision loss that can lead to blindness. Treatment can help restore vision or stop it from getting worse. Knowing about the eye and its parts will help you keep the eyes healthy and take care of eye problems.

THE PARTS OF THE EYE

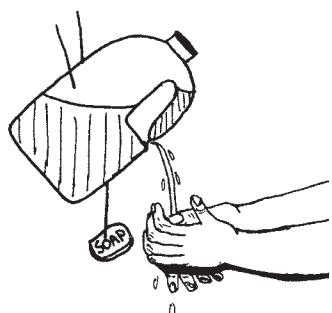


When eyes are healthy:

- The eyelids open and shut easily and the eye lashes curve outward, not in toward the eye.
- The white part is all white, smooth, and moist.
- The cornea, the clear covering of the iris and pupil, is shiny, smooth and transparent.
- The pupil is black and round. This black part reacts to more or less light by becoming smaller or bigger.



Keep the eyes clean



To help prevent many eye problems, wash your face often. This keeps dirt and germs from getting in the eye and causing problems.

You do not need a lot of water to wash the face. You can make a Tippy-Tap from a clean plastic bottle or container (see Water and Sanitation: Keys to Staying Healthy, page 4). Let the air dry your face and hands to avoid infections from sharing cloth or towels.

When eyes are infected, clean them often with a clean cloth and clean water. Wipe gently from the corner of the eye nearest to the nose outward to the corner of the eye by the ear. Use a different part of the cloth to clean each eye and then wash the cloth well and dry it before you use it again.



Wash your hands with soap before and after cleaning eyes that are infected to prevent spreading infection.

How to remove dirt or an eyelash from the eye

Have the person close her eyes and move her eyes around from side to side, and up and down. Then, while you hold her eyelid open, have her look up and down again. This makes the eye produce tears that often wash out the dirt. Another way of making tears is to gently rub the good eye. This produces tears in both eyes. Do not rub the sore eye.

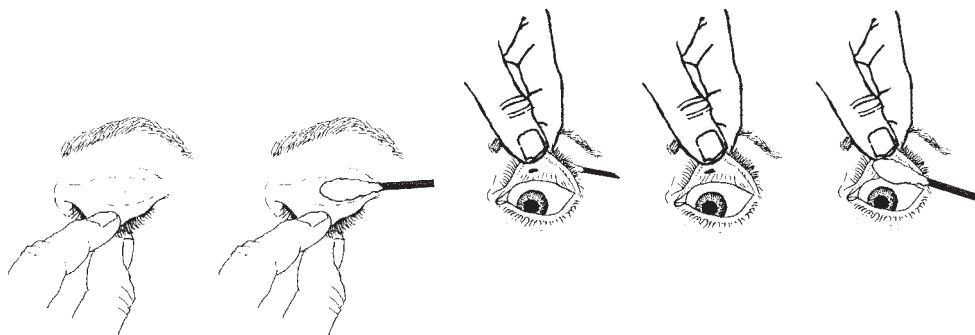
Or you can try to remove the bit of dirt or eyelash with clean water. Use only clean water, not any other liquid. Hold the eye open while rinsing with water from a cup (or by gently squirting water with a clean syringe and no needle). The person can lie down or tilt her head back while you pour water so it runs from the inside (near the nose) to the outside of the eye (near the ear).

If you can see it, the bit of dirt can be gently removed with the corner of a damp, clean cloth, tissue, or cotton swab.

When dirt is under the upper eyelid, you may only be able to see it by turning the upper eyelid over a cotton swab. Ask the person to look down while you do this.



Something trapped under the eyelid can scratch or scrape your eye, so do not rub the eye. Tears can help wash it out.



Remove the eyelash or bit of dirt with the corner of a clean cloth, tissue, or cotton swab.
Always move the dirt away from the eye.

If you cannot get the dirt out easily, put a small amount of antibiotic eye ointment where the irritation is felt, protect the eye (see page 12), and send the person for medical help.

Workplace dangers, pollution, and sun harm eyes

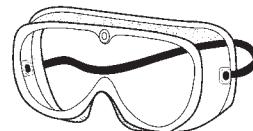
Chemicals, air and water pollution, and the strong rays in sunlight (called ultraviolet or UV rays) can irritate the eyes and cause problems. At home or at work, eyes can be injured by many things, or burned by chemicals.

- **Cooking:** smoke from cooking fires and stoves irritates and dries the eyes. This affects women and children most.
- **Air pollution:** dust and chemicals in the air affect the eyes of everyone who works or plays outside, especially children.
- **Water pollution:** chemicals from factories or mines, pesticides, and sewage are released into rivers or lakes, irritating the eyes and skin of people who bathe or wash clothes there.
- **Agriculture:** tools, dirt, rocks, tree branches, poisonous plants, chemical fertilizers and pesticides can all damage the eyes.
- **Outside:** sun, dust, and wind can irritate the eyes.
- **Riding a motorcycle** without protecting eyes can lead to eye injury.
- **Chemicals:** factory workers, farmers, miners, janitors, domestic workers and others use chemicals. If chemicals touch the eye, they can burn it very quickly (page 11).
- **Machines or equipment:** pieces of metal or wood can break off and injure the eye, as can high heat, sparks, or flames.
- **Office and factory workers:** having to focus the eyes on one task for many hours strains the eyes.

Safety glasses and goggles protect eyes from injury



All glasses help protect eyes. Use safety glasses or safety goggles when using machines or power tools, riding a motorcycle, or if you are working with pesticides or other chemicals.



For more on protecting eyes in the workplace, see Hesperian's *Workers' Guide to Health and Safety*.

Hats and sunglasses protect eyes from sun

People outside in strong sunlight can protect their eyes by wearing a hat and, if possible, dark glasses. Glasses that are made to screen out UV (ultraviolet) sun rays are best. Protection from the sun may slow the advance of some types of cataracts (see page 19). Even after many years of too much sun, using hats and sunglasses may prevent eye problems from getting worse.



Avoid eye strain

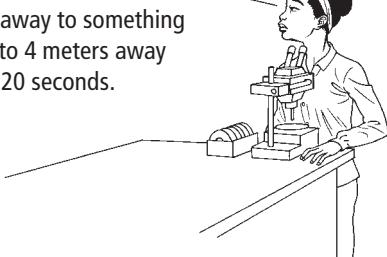
Working where there is not enough light, looking at the screen of your computer or mobile phone all the time, or focusing your eyes for many hours on something close is hard on the eyes. Reduce eye strain by improving lighting and regularly looking away at something across the room. Older workers may need reading glasses for close-up work (page 29).



First look at something close to you.



Then look away to something about 3 to 4 meters away for 20 seconds.



Do this a few times each hour. Also, it helps to move your eyes around: keep your head still and move your eyes to look up one wall, around the ceiling, and down the other wall.

Care for the eyes with good food

Many foods that help the body stay healthy also help people have good vision. Foods especially good for eye health include:

- Vegetables: leafy greens, pepper, peas, beans, sweet potato, carrot, and pumpkin
- Fruits: mango, papaya, orange, and avocado
- Fish, nuts, and whole grains

Eating nutritious foods during pregnancy helps the developing baby's eyes. Breastfeeding babies and making sure young children eat green and orange vegetables and fruits can prevent vitamin A deficiency (page 23).



Save your money for nutritious foods and keep away the salt and sugar. The chapter Good Food Makes Good Health has ideas on how to eat well even when you have little money.

Health workers and community eye health

Dealing with eye emergencies is unfortunately common for health workers and health promoters, but everyday eye and vision problems may not be. When health workers learn to recognize early signs of eye problems, they can help people improve their vision and prevent people from losing their sight.

- Learn to look for redness, swelling, itching, or gray spots in the eyes when you see patients – and what each sign means and how to treat it.
- Make it easier for women to receive eye exams and eye treatment. Their work and family roles make them more likely to suffer eye problems.
- Help people know what home remedies and commercial products might be dangerous for the eye and not to spend money on false cures.
- Organize a yearly vision check for children at school and train teachers to recognize signs of eye problems, especially poor vision.
- Refer older people for treatment if they have cataracts.
- Help people over the age of 40 get reading glasses if they need them.
- Make your community a safe place for people who are blind (page 30).

Health workers can also share information on programs and eye hospitals that offer low-cost or free care for eye problems and emergencies. Organize community members to get vision testing, eyeglasses, and cataract surgery at not-for-profit and government organized events (see page 20).

Common eye problems by age:

Babies' eye infections need to be treated. Some of these are prevented by cleaning the baby's eyes and using eye ointment at birth (see page 33).

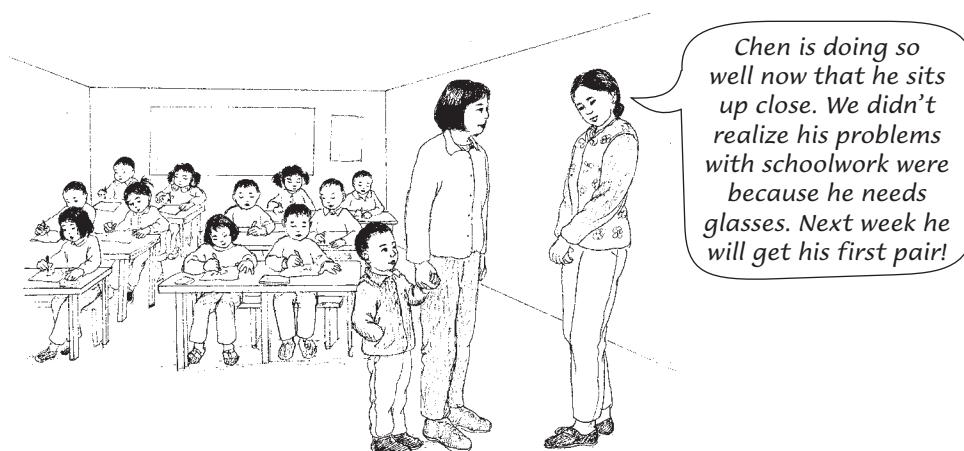
Young children's vision problems may be hard to notice. Starting at 6 months old, see if the child's eyes move and follow a light or a toy when you move it around. A child with a wandering or crossed eye can be helped (page 24) and glasses may help with poor vision. For children with very limited or no vision, Hesperian's book *Helping Children Who Are Blind* shows many ways to help a blind child develop her skills.

School-age children who cannot see clearly cannot tell you they need eyeglasses because they do not know what good vision would be like. A child who has headaches, squints a lot or is having difficulty in school or playing games may have a vision problem and need eyeglasses. It is also a good idea to learn what to do if there is an eye injury from sports or fighting at school.

Any child can get eye injuries. Keep chemicals and sharp objects locked away and out of reach of children.

Adult vision may change at any age and sometimes eyeglasses can help. If a person has diabetes or high blood pressure, treatment to manage these problems will help prevent further harm to the eyes. Different kinds of work make some eye injuries or eye conditions more likely (page 4).

Older adults are more likely to develop cataracts (page 19) and need reading glasses (page 29).



Eye Emergencies and Injuries

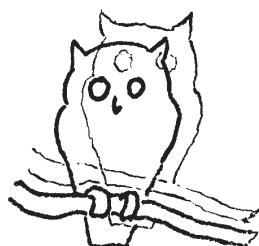
Some eye problems like injuries are clearly emergencies. Other eye problems may seem less urgent, such as signs of illness or infection, but if there are danger signs, they too can quickly lead to blindness.

Protect the eye (see page 12) and send the person to get emergency medical help for these danger signs:

DANGER SIGNS

- Sudden loss of vision in one or both eyes
- Any injury that cuts into the eyeball (page 9) or eyelid
- An injury with blood inside the colored part of the eye (page 10)
- Severe pain in the eye with a white-grayish spot on the clear part (cornea). Treat with antibiotic ointment (see pages 32 to 33) on the way to help. This could be an ulcer on the cornea (page 16).
- Severe pain inside the eye. This could be iritis (page 17) or acute glaucoma (page 20).
- Pus inside the colored part of the eye (page 10)
- In a baby or child, a cloudy or white pupil
- Seeing small spots (floaters, see page 23) are not an eye emergency unless they start suddenly along with flashes of light. This can happen when the retina, a part inside the eye, comes loose from the back of the eye. Surgery is needed soon to prevent loss of vision.
- Sudden double vision, especially in both eyes at once, can be a sign of several problems.

Also treat as an emergency any infection or inflammation that does not get better after 4 days of antibiotic ointment or drops.



Double vision is seeing everything as if there were two. Suddenly seeing double may indicate a serious problem. Get medical help.

Injuries to the eye

Anything sharp or that can scratch the eye, such as thorns, branches, or pieces of metal from factory or other work, can seriously injure the eye. Treatment by an experienced health worker is important so injury does not lead to blindness. Even small scratches or cuts can get infected and harm vision if not cared for correctly. A wound inside the eyeball is especially dangerous.

If the eye has been hit hard with a fist, stone or other hard object, the eye is in danger. And if the eye becomes very painful 1 or 2 days after being hit, this could be acute glaucoma (page 20).

DANGER SIGNS

- The person cannot see well with the injured eye.
- There is a thorn, splinter, or other object stuck in the eye.
- The wound is deep.
- There is blood or pus inside the colored part of the eye.
- The pupils do not get smaller in response to brighter light.

TREATMENT

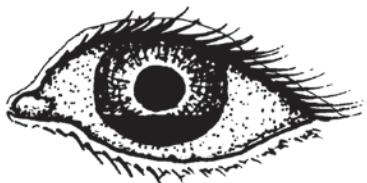
Apply an antibiotic eye drop if available and cover the eye by taping a paper cup over the eye, gently bandaging around the object, or using a cone made out of stiff paper (see page 12). Send the person for medical help.

If the person has none of these danger signs and can see well with the injured eye, apply antibiotic eye treatment (see pages 31 to 33), lightly cover the eye with a clean eye pad, and wait for a day or two. But if the eye does not improve, get medical help.



If you help a person who has been hit, try to find out if she was abused and is still in danger. Help people suffering violence in the home or workplace. See Chapter 18 in *Where Women Have No Doctor*.

Bleeding behind the cornea (hyphaema)



Blood pooling behind the cornea
is dangerous.

Blood in the colored part of the eye (the iris) is serious. The blood is trapped behind the clear covering (cornea) and may cover the iris. The person will not see well and may feel pain. The cause of this kind of bleeding is usually because the eye was hit with something hard, like a fist or stone. Send the person to an eye specialist right away. Have him sit upright on the way so that the bleeding does not block his vision.

If there is blood in the white part of the eye, usually it is not dangerous and will go away in a few weeks (see Blood in the white of the eye, page 21).

Pus behind the cornea (hypopyon)

Pus trapped between the clear covering (cornea) and the colored part of the eye (iris) is a sign that eye is in danger. The pus shows there is severe inflammation. This can occur because of an ulcer on the cornea or after eye surgery. Put antibiotic eye ointment in the eye (pages 31 to 33) and send the person for medical help right away.



Injuries to the eye from chemicals

When cleaners, pesticides, gasoline (petrol) or other fuels, car battery acid, snake venom, lime powder (limestone), or other chemicals get into the eye, they can cause immediate injury so it is important to act quickly.

1. You will need lots of clean water to pour on the eye.
2. Have the person lie down.
3. The chemical may be trapped under the eyelid. Hold the eye or eyes open (the injured person or another person can help) as you gently pour the water onto the eye to rinse it.
4. As you wash the chemical out, don't let the water run from one eye into the other. If only one eye is affected, tilt the head so the water runs toward the side of the head, not toward the other eye. If the chemical went into both eyes, tilt the head back and pour the water on the nose so that it runs toward both eyes at the same time.
5. Keep pouring water gently over the eye or eyes for at least 15 minutes to 30 minutes. The chemical may still be causing harm to the eye even if it seems to have washed away.
6. After rinsing, put antibiotic ointment in the affected eye or eyes and send the person for medical help.



Police may use chemicals such as pepper spray and tear gas that irritate or harm eyes. See Police Weapons in the First Aid chapter.

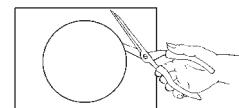


Protect eyes when injured or healing

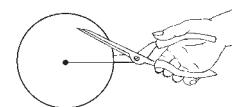
After an injury, a paper cup or an eye cone can protect the eye while the person goes for emergency help. The eye cone will help remind the person not to rub her eye by mistake and can prevent the injury from getting worse.

Make an eye cone

1. Cut a circle out of a clean piece of heavy paper or thin cardboard.



2. Cut into the middle in a straight line, and make a small hole in the middle.



3. Make a cone shape.



4. Tape the cone, outside and inside.



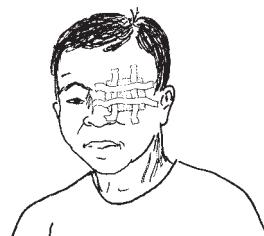
5. Tape the cone over the injured closed eye using tape that sticks well to skin.



If you cannot make an eye cone or the injury is not severe, use an eye pad. If a person had an operation, help change the eye pad often. If there are signs of infection, like redness and discharge, this is a sign the eye needs urgent treatment. In this case, covering the eye can make it worse.

Make an eye pad

1. Wash your hands well with soap and water.
2. Do not touch the eye with your hands.
3. Ask the person to shut both eyes while you cover the eye that needs the eye pad.
4. Cover the eye with sterile gauze or a very clean cloth cut into a square (6 centimeter sides).
5. Layer another 1 or 2 squares over the eye and use long strips of adhesive tape that sticks to skin to keep the eye pad in place.



Red Eyes and Painful Eyes

Various problems cause red, painful eyes. When trying to determine the problem and what to do about it, ask the person if there was an injury to the eye or if he felt something go into the eyes.

Type of redness and pain	Possible cause
Usually both eyes but may start in one eye Mild burning pain Usually reddest at outer edges	If there is also thick white or yellow discharge, probably a bacterial infection called conjunctivitis (page 14) Trachoma (page 17) Measles (see Caring for Children, page 22)
One or both eyes Redness and pain may be severe	An injury to the eye from something sharp or from a blow (page 9) Chemical burns or harmful liquids in the eye (page 11)
Usually one eye only Bleeding inside the eye, affecting the iris (colored part)	Bleeding in the colored part of the eye (page 10), often because of an injury This is an emergency.
Usually one eye only Redness and pain—not severe at first but can get worse	A bit of dirt in the eye (page 3) Scratch on the eye surface (page 16)
Usually one eye only Pain often severe Reddest close to the iris	Ulcer on the cornea (page 16) Iritis (page 17) Acute glaucoma (page 20) All are emergencies.
Usually one eye only Redness with a bump or swelling on the eyelid (with or without pain)	Infection around the eyelash or under the eyelid (page 22)
Usually one eye only Bright red patch on the white part of the eye	Probably a tiny blood vessel has burst, not an emergency (page 21)
Usually both eyes Discomfort but not pain Redness and itchy, watery eyes and sneezing, worse at certain seasons during the year	Hay fever, also called allergic conjunctivitis (page 16)
Usually both eyes Redness but no discharge and no pain Rash or fever	Conjunctivitis caused by a virus. If your region has Zika virus, red eyes could be one of the signs.

If there is redness, check if eyes are watery or have discharge (pus or secretions):

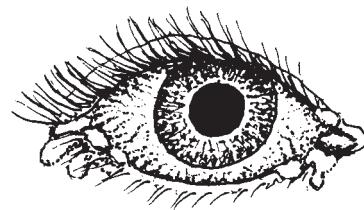
- Thick secretions or discharge can be conjunctivitis ('pink eye' or 'red eye'), a bacterial infection, especially if the eye is also very red.
- Watery eyes, with mild redness, that feel itchy in the corner of the eyes near the nose, are usually allergies.
- Watery eyes, with mild redness after a cold or flu, may be caused by a virus. This needs no special treatment and medicines will not help.
- Watery eyes, with redness and fever, cough and a runny nose, could be a sign of measles, even before a rash appears.

Conjunctivitis ('pink eye', 'red eye')

Conjunctivitis can occur at any age, but is especially common in children.

SIGNS

- Eye looks pink or red
- Eye may itch or burn
- Starts in one eye, may spread to both
- Thick discharge may cause the eyelids to stick together overnight



TREATMENT

Most conjunctivitis is caused by a virus that goes away in a few days without any special treatment.

If the yellow or white discharge is thick, the cause is likely a bacteria that can be treated with antibiotic eye ointment or drops (see Antibiotic eye treatments, pages 32 to 33). Even if the eye seems better, use the treatment for all 7 days so the infection does not come back.

Before applying antibiotic eye treatment, gently clean each eye with separate, wet cloths. Change cloths and wash your hands between cleaning and treating each eye to avoid spreading the infection from one eye to the other, or to yourself or other people.

PREVENTION

Conjunctivitis spreads very easily from one person to another. Wash hands often and after touching the eyes of another person or your own. Do not let a child with conjunctivitis use towels or bedding that others will use. Separate the child from other children until her eyes are better.

Conjunctivitis in newborn babies

An infection in a baby's eyes needs prompt treatment.

SIGNS

- Red, swollen eyes
- Pus in eyes
- Eyelids stuck together, especially upon waking



A newborn baby with red, swollen eyelids and pus may have an infection of gonorrhea or chlamydia that passed during birth. If eyes are swollen when the baby is between 2 and 4 days old, it is more likely to be gonorrhea. Treat immediately to prevent harm to the baby's eyes. If they are swollen when the baby is between 5 and 12 days old, it is more likely to be chlamydia. These infections, which spread during sex, affect many men

and women but often give no signs of sickness. It is best to test and treat all pregnant women for these infections to prevent the baby from getting them at birth.

To protect the eyes from permanent damage and blindness, use antibiotic eye ointment (pages 32 to 33). Test the baby and mother to know what kind of infection they have. Both will need further treatment with antibiotics, not just eye ointment.

Care for a newborn baby's eyes to prevent problems

Immediately at birth, gently clean the baby's eyes with a new cotton swab. Then put antibiotic eye ointment on the eyes of a newborn baby to prevent eye infections. Use 1% tetracycline OR 0.5% to 1% erythromycin ointment. Put a thin line of ointment in each eye, 1 time only. Do this right away, within 2 hours after birth (see Antibiotic eye treatments, pages 32 to 33).

If a baby has watery eyes all the time, especially if tears fill the eye and run down the face even when the baby is not crying, it could be that the tiny tubes that drain tears away from the eye are blocked. This problem often goes away by itself, but a health worker can show you how to gently massage the baby's face on the side of the nose (Crigler or lacrimal sac massage), to help open the tubes.

Hay fever (allergic conjunctivitis) and allergies bothering the eyes

Dust, pollen, or other particles in the air cause sneezing along with red, itchy, and watery eyes in some people. When the body reacts with the same signs to the same thing every time, it is called an allergy. If this happens only certain times of the year, the person may have an allergy to pollen released by trees and plants (also called hay fever). If it happens all the time, the cause could be dust, mold, chemical products, or animals. Allergies irritate both eyes.

TREATMENT

If you know what is causing the eyes to react, the best treatment is to avoid or remove the source of the problem. For example:

- Try to keep sleeping areas and bedding free from dust. If an animal is causing the allergy, avoid the animal and the area where it sleeps.
- Close or cover windows at night.
- Use a dust mask or cloth to over your mouth and nose to protect yourself from breathing pollen and dust when working or walking outside.

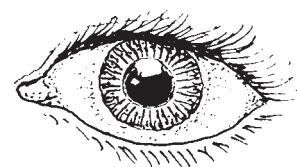
Anything that is very close to your eye, like eye makeup, or something you can smell, such as clothing washed with perfumed soap, can also cause allergies that affect the eyes. If you stop using the product that is irritating your eyes, the allergy should bother you less.

Sooth itching eyes with a wet folded cloth over your eyes (cool water feels best). If antihistamine eye drops (see page 32) are available, they may help eyes feel better when hay fever is severe.

Ulcer on the cornea (damage to eye surface)

SIGNS

When the very delicate surface of the eye is damaged by infection or scratched, a painful corneal ulcer can result. Do not rub your eye, it only makes it worse.



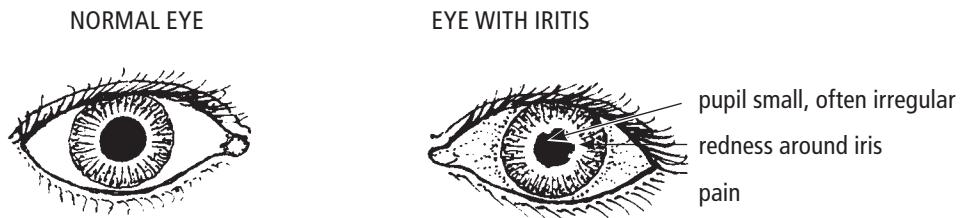
The person's vision is often reduced and they have severe pain. They may have thick or watery discharge.

The eye is red and if you look at the cornea in strong or bright light, you may see a gray-white patch. It may look less shiny than the rest of the eye.

TREATMENT

This is an emergency. If the ulcer on the cornea is not well cared for, it can cause blindness. Get medical help. Apply antibiotic eye ointment or drops in the affected eye every hour on the way to see an eye specialist (see pages 32 to 33).

Iritis (inflammation of the iris)



Inflammation of the iris is called iritis. Its cause is usually not known.

SIGNS

- Usually in one eye only
- Deep aching pain in the eye
- The pupil (the black center of the eye) may have an irregular shape instead of round
- Redness on the white part of the eye closest to the iris
- The eye hurts more in bright light
- Vision is usually blurred

TREATMENT

Iritis is a serious eye problem and is painful. Get medical help within 1 to 2 days.

Antibiotics are not useful.

An experienced health worker may use eye drops to increase the size of the pupil, and other eye drops to decrease inflammation.

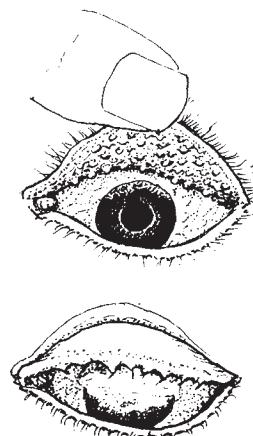
Trachoma — a chronic conjunctivitis

Trachoma is an eye infection that spreads from one person to another by hands, flies, and cloths that touched an infected eye. Trachoma is most common in children and their mothers. If a person is infected many times, after several years this can make the eyelashes turn in and scratch the eye's surface, which causes pain and loss of vision. Because it feels scratchy, it is sometimes called "hair in the eye."

Trachoma has become less common in the world but is still a serious problem in some countries, especially in Sub-Saharan Africa. It mostly affects people who live in poverty, in crowded conditions, and where there are many flies and little water. Improving water and sanitation is important in preventing trachoma.

SIGNS

- Trachoma often begins in young children like a mild conjunctivitis that is not very noticeable at first.
- Repeated infections in young children cause small white-gray swellings to form inside the upper eyelids. To see these, fold the eyelid back (see page 3).
- After years of repeated infections, these swellings or bumps become white scars under the eyelid. Scars pull the eyelashes inward and these scratch the clear part of the eye, causing pain to the eye and loss of vision.



TREATMENT

The best treatment for trachoma is a single dose of azithromycin (page 34) by mouth. If azithromycin is not available, 1% tetracycline eye ointment inside the eye 2 times a day for 6 weeks also works.

For people with advanced trachoma, a simple surgery can make the turned-in eyelashes turn outward again. If surgery is not available, a trained eye-health worker may be able to remove the irritating eyelashes.

PREVENTION

Early and complete treatment of trachoma prevents its spread to other people. Wash children's faces every day and wash your hands after touching anyone's eyes. Wash towels, clothes, and bedding often to be sure that 2 people never share a pillow or the same cloth to dry their faces.

Keep flies away by covering food, keeping latrines covered, and composting away from the house. See Water and Sanitation: Keys to Staying Healthy.

If there are many cases in your community, health authorities may treat everyone in the community with azithromycin to stop trachoma from spreading.



Trachoma is spread by flies, fingers, and fabric.

Common Eye Problems

Cataracts

The lens is a clear part inside the eye that focuses the light from outside so the eye can see. As people get older, the lens can become cloudy, blocking light from shining through it, and leading to a gradual loss of vision and eventual blindness. This cloudiness can sometimes be seen as a gray spot on the eye, called a cataract. Cataracts are most common in older people, but may occur in babies and children.



To delay the development of cataracts:

- Don't smoke.
- Wear hats to protect the eyes from strong sunlight.

Health workers can identify people with cataracts and recommend programs and hospitals that offer operations to restore sight. Women are less likely than men to get treatment for cataracts. Visit older women in their homes and ask about their eyesight. Checking older people can help them get treated before cataracts block their vision. But even if they can barely see, it is never too late to get them help.



We say: "If there is gray hair, check for gray eyes." We encourage older people with cataracts to get the operation to bring back their vision.

TREATMENT

Medicines do not help a cataract go away. An operation removes the cataract (the cloudy lens) and puts in a clear lens so the person can see again.

After the operation, the person will need antibiotic and anti-inflammatory eye drops to help the eye heal, usually for about 4 weeks. The eye may be slightly uncomfortable and seeing can be blurred at first, but this should improve a little each day. If pain in the eye develops in the first two weeks, this is a danger sign. Get help from an eye doctor within 24 hours. Reading glasses may be needed after the operation in order to see close up.

When eye health programs come to the community

Doctors from your country or elsewhere may organize events to remedy eye problems, including operations to treat cataracts.

Community leaders can work with the doctors to benefit as many people as possible. The helping group should provide:

- clear explanations to local health workers on how to care for the eyes after the operation.
- the eye drops that people will need to heal.
- information on where people can get eyeglasses, if needed, after the eyes have healed.
- who to contact if a problem arises after the operation, both in their organization and locally.

Glaucoma

Sometimes pressure increases inside the eye and damages nerves inside the eye, causing a serious disease called glaucoma. A person with glaucoma loses side vision and gradually can become blind. The eye may hurt and get hard like a marble. Glaucoma may be caused by an injury, but most often the cause is unknown.

A person with glaucoma needs treatment to lower the pressure. This may be eye drops daily for the rest of their life, or sometimes laser treatment or an operation is used to lower the eye pressure.

Glaucoma mostly affects people who are older than 40, especially those who have had a family member with glaucoma. Help people over 40 get their eyes checked for glaucoma every few years.

There are different forms of glaucoma. Most common are acute glaucoma and chronic glaucoma.

Acute glaucoma (angle-closure glaucoma)

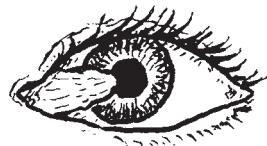
This worsens very quickly. It causes a red and very painful eye with loss of vision. The person may feel nausea, have a headache, and their eye hurts more in bright light. The eye may feel hard compared to the other, normal eye. If not treated, acute glaucoma will cause blindness within a few days. Send the person for medical help immediately. They will first need eye drops that lower the pressure in the eye. Then they will likely need laser treatment or an operation.

Chronic glaucoma (open-angle glaucoma)

In chronic glaucoma, the pressure in both eyes increases slowly over months and years. There is no pain. Side (peripheral) vision is lost first. As the glaucoma gets worse, it is like looking through a tunnel. The person often does not notice until vision loss is severe. Eye doctors can test side vision and look inside the eye to check for this kind of glaucoma. The earlier it is treated, the better. Treatment with eye drops, laser, or surgery can stop vision from getting worse.

Fleshy growth across eye (pterygium)

A fleshy thickening on the eye surface that slowly grows out from the white part of the eye near the nose and toward the middle is called a pterygium. It is common and usually not serious. People who spend many years working outside in strong sunlight or where there is wind or dust are more likely to have them.



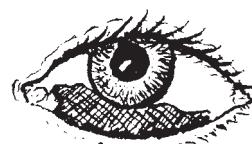
Wearing dark glasses and hats helps keep sunlight, wind, and dust away from the eyes, which prevents or slows the growth.

Often these need no treatment. If it is too close to the colored part of the eye or causes too much discomfort, the growth can be removed by an eye surgeon before it begins to affect the person's vision.

Blood in the white of the eye

Blood in the white of the eye occasionally appears after lifting something heavy, coughing hard, or a minor injury to the eye. It results from the bursting of a tiny blood vessel. It is harmless, like a bruise, and it will slowly disappear on its own within 2 weeks. No treatment is needed.

However, if blood is in the colored part of the eye (the iris), this is serious. See page 10.



A patch of blood in the white part is usually harmless.

Dry eyes and crusty eyelids

Dry eyes are caused by dry climates, getting older, smoke in the air, and some medications.

Crusty eyelids can happen when dirt or discharge blocks moisture and tears, making eyes dry and itchy. The person may get eyelid infections (see below) or crust or dandruff-like flakes along the eyelid. When the eyelids and face around the eyes are clean, the tears and natural moisture of the eyes can keep them healthy.

TREATMENT

For dry eyes, rest your eyes by closing them now and then. If your eyes stay dry, you can try warm compresses 1 to 2 times a day for 5 to 10 minutes to increase the natural moisture in the eyes. Lubricating eye drops can also help (see page 32).

For crust on the eyelids, use warm compresses 2 to 4 times a day, followed by a gentle washing of the eyelids. If it does not improve, there may be a bacterial infection and you can try erythromycin antibiotic eye ointment 2 times a day for 7 days (see Antibiotic eye treatments, page 32).

Lumps and swelling on the eyelids

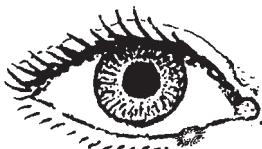
A red swollen lump on the eyelid usually is either:

- a stye, a painful lump caused by an infection around an eyelash; or
- a chalazion, a lump that may not hurt, caused by blockage inside the eyelid.

Sometimes an infection that starts around an eyelash can spread to inside the eyelid.

Both can be treated with warm compresses 4 times a day for 15 or 20 minutes each time. Re-heat the cloth several times while using to keep it as warm as possible without burning. Do not squeeze or puncture the lump as this makes the problem worse.

If swelling does not lessen in a few days, get medical help.



A stye is a painful infection around the eyelash.



A lump under the eyelid that does not hurt may be a chalazion.

Floater (seeing small spots)

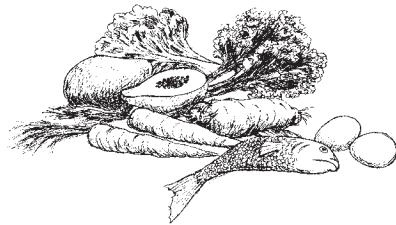
Floater or small moving spots are sometimes seen when looking at a bright surface (like a wall or the sky). The spots move when the eyes move and look like tiny flies. These spots are common and usually harmless.

If large numbers of floating spots appear suddenly and vision begins to fail in one eye, or you also continue to see flashes of light, this could be a sign of a condition called a detached retina. A surgery at an eye hospital is needed as soon as possible to reattach the retina.

Vitamin A deficiency (night blindness, xerophthalmia)

Lack of vitamin A is a type of malnutrition that can damage the eyes of children, causing blindness. This is preventable.

Protect the eyes of small children by making sure they eat foods rich with vitamin A, including orange foods such as carrots, mango, and papaya, and green leafy vegetables, fish, and eggs. Breastfeeding helps protect a baby's eyes from lack of vitamin A along with providing many other benefits for the baby's health.



Where this type of malnutrition is common, sometimes all children are given a vitamin A supplement every 6 months (page 34).

SIGNS

First, the eyes become dry and produce less tears. Then there is more difficulty seeing in dim light. The white part of the eye loses its shine and starts to wrinkle. Eventually the eyes become more damaged and the child may become blind.

TREATMENT

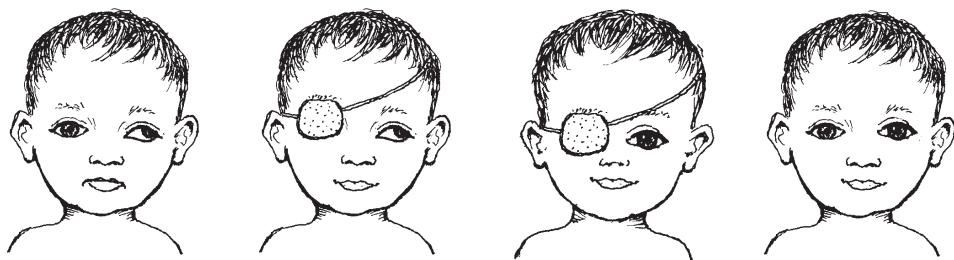
If a child cannot see well in the evening or if the child has measles, then treat the child with vitamin A (page 34).

Crossed eyes, wandering eye, squint (strabismus)

If one or both eyes of a baby or a child do not look straight, this condition can lead to a loss of vision in the wandering eye. Get the child to an eye specialist. It is not an emergency, but the child should go as young as possible to have the best chance of correcting his vision.

TREATMENT

The eye doctor may patch the good eye to make the wandering eye work better or prescribe special glasses to help. An operation can usually straighten the eye but is often not necessary.



Sometimes patching the good eye will help the wandering eye become straight and better at seeing.
 Some children need the patch a few hours a day and some will need to wear it all day.

Pregnancy and vision

Changes in hormones can cause a woman's vision to change during pregnancy, but usually after the baby is born her vision goes back to the way it was.

Pregnant women who suddenly have blurred vision, see spots, lose vision in one eye, or have double vision could be having danger signs of a serious condition called pre-eclampsia. Pre-eclampsia also brings headaches and high blood pressure (140/90 or higher). Get help right away.

Help pregnant women get tested for gonorrhea and chlamydia and to receive treatment if they need it. Women can have either of these illnesses that are passed during sex and not know it. If these germs spread to the baby's eyes during birth, the baby can lose her sight.

Protect pregnant women from rubella and Zika, illnesses that can cause serious eye problems in babies. Rubella (German measles) is prevented by a vaccine. For more information on Zika and how to prevent it, see Illnesses from Mosquitoes (in development).

Illnesses that Can Affect the Eyes

Some infections or illnesses affecting the whole body can harm the eyes. When someone has eye problems, it is wise to consider if the cause could be another illness.

Tuberculosis can infect the eyes and cause redness or poor vision. Most often, signs of tuberculosis will appear first in the lungs or other parts of the body.

HIV and AIDS: Eye problems and loss of vision in people with HIV are prevented by treatment with HIV medicines, called ART. Get tested so you can start treatment if you need it.

Herpes (cold sores) occasionally spreads to the eye, causing an ulcer of the cornea with pain, blurred vision, and watery eyes. Antiviral medicines are helpful. Do not use steroid eye drops—they make the problem worse.

Problems in the liver: Jaundice, when the white part of the eye is yellow (or the skin of a light-colored person gets yellow), can be a sign of hepatitis (see Belly Pain, Diarrhea, and Worms, page 7).

Diabetes and high blood pressure

People with diabetes may develop vision problems. As the disease advances, diabetes can damage their eyes (a serious condition called diabetic retinopathy). Without treatment, diabetes can lead to blindness. Blurred vision can be an early sign that blood sugar is high and a person may have diabetes. If someone with blurred vision also is very thirsty and has to urinate a lot, it is likely they have diabetes. Inexpensive tests can let them know for sure.

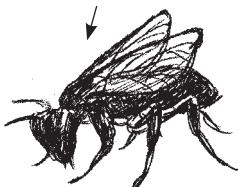
Help people with diabetes get treatment to bring down their blood sugar levels and encourage them to visit an eye specialist once a year to check their eyes for damage from diabetes. Eye disease from diabetes can be treated if found early.

High blood pressure can affect the eyes and vision by damaging the blood vessels inside the eye. Checking blood pressure during health care visits is the best way to know if it is too high. Preventing and treating high blood pressure will help protect the eyes.

River blindness (onchocerciasis)

This disease of the eyes and skin is becoming less common. It is still found in parts of Africa, Yemen, and a few communities in the Amazon region of South America. River blindness is caused by tiny worms that are carried by black flies. The worms get inside a person when an infected fly bites him.

The black fly has a humped back like this



but is actually much smaller, like this.



SIGNS

- Itchy skin and rash
- 2 to 3 cm lumps you can feel under the skin

Without treatment, the skin gradually becomes wrinkled and loose. White spots and patches may appear on the front of the lower legs.

The illness can lead to eye problems and sometimes blindness. First there may be redness and watery eyes, then signs of iritis may follow (page 17).

TREATMENT

The medicine ivermectin treats river blindness. Where ivermectin is given every 6 months or once a year as part of community-wide campaigns, fewer people get the disease and it may disappear from the region.

PREVENTION

- These black flies breed in fast-running water. Clearing brush from the edges of stream and river banks helps reduce their number.
- Avoid sleeping outside, especially in the daytime when the flies bite most.
- Cooperate with programs working to lower the number of black flies and with the health workers giving ivermectin to the whole community to prevent new cases.

Early treatment prevents blindness and reduces spread of the disease.

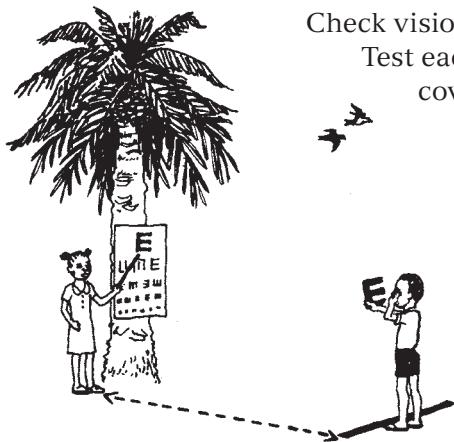
Poor Vision and Eyeglasses

Many children and adults do not see well. A person may not see people or read signs clearly from far away or must squint to see up close. They may have headaches or blurred vision after reading before realizing they need eyeglasses. With eyeglasses matched to your eyes, you can see better. See if there are programs where you live that test vision and supply free or low-cost eyeglasses.

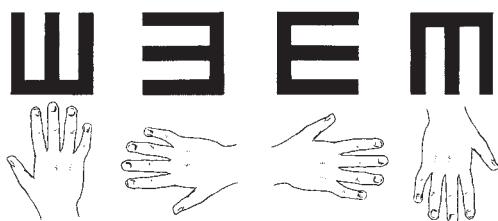
It is common for a person's vision to change. You may need to change your eyeglasses every few years.



Testing sight for distance vision



Check vision with an 'E' chart (see Appendix A). Test each eye separately by having the person cover the other eye with the palm of their hand or thick paper. The person looks at each row and uses their free hand or a paper 'E' to show if the bars on the 'E' point up, down, or to one side. The row with the smallest size of letters they see well is the measure of their eyesight. For example, if the person can read most of the row of letters labeled 6/12 but less than half of the row of smaller letters after that, we say they have 6/12 vision.



Use your hand to point the same way
as the bars on the 'E.'

For an adult, if distance vision is poor (they cannot read the 6/18 or smaller letters on the eye chart), send them to an eye doctor. For school children, check to make sure they can read the 6/12 line letters. Sometimes a child does not do well in school only because she cannot see clearly from far away. Eyeglasses will help her learn.

'E' charts are made in different sizes to be used at 6 meters, 3 meters, or other distances. There are also mobile phone applications that make an 'E' of different sizes to do the same test without a chart. For the test to be accurate, follow the instructions carefully for the chart or phone app you are using. Carefully measure the correct distance where the person needs to stand.

Print the 'E' chart, found at the end of this chapter, on letter-sized paper to use with the person standing 3 meters away from the chart.



There are 2 ways of writing how well the person sees based on an eye chart test. The number sets showing 20/200, 20/20 etc. begin with the number 20 because 20 feet is the distance for a larger eye chart. Using meters, the numbers are 6/60, 6/6 etc. because 6 meters is about 20 feet. Any chart or measure system you use will likely have one of these 2 number systems to label the different rows even if the chart is meant to be used at distance other than 20 feet or 6 meters. The better the eyesight, the lower the second number:

6/18 = 20/60: An adult sees well enough for most work

6/12 = 20/40: A child sees well enough for school

6/6 = 20/20: The person sees very well

Reading glasses

People over the age of 40 years may have a harder time seeing well enough to do close-up tasks like reading, sorting seeds, or threading a needle. Reading glasses magnify close-up things to look larger. They come in several different strengths of magnification. Glasses that are labeled +1 make close objects look slightly bigger, +2 make them look even bigger, and +3 the biggest. Test each of the different reading glasses by trying to read a book or thread a needle at a comfortable distance.



If a person has trouble seeing close up and also cannot see well far away, reading glasses may not solve the problem. Help them visit an eye clinic to find out what is affecting their vision.

Contact lenses and surgery to correct vision

Contact lenses are tiny plastic lenses that rest directly on the eye to correct vision, just as eyeglasses do. After a vision test, a specialist can help you find contact lenses that will work for your eyes. Do not use contact lenses made for someone else. Do not sleep wearing contact lenses unless they are made for overnight use. There are many different kinds of contact lenses and each needs specific liquids to disinfect, store and rinse them. Do not use homemade versions of the contact lens liquids.

While contact lenses are convenient, they can cause serious problems if not cared for and used properly. To prevent infections, always wash your hands before touching contact lenses. If you have mild irritation in your eye or an eye infection, do not use contact lenses until your eyes are better. Clean and disinfect lenses before wearing them again. If a contact lens has a torn edge, do not use it. If you have pain, burning, discharge, unusual redness, or blurred vision, this could be a danger sign of a scratch or ulcer on the cornea (page 16) or another serious problem. Get help from an experienced health worker.

For some people, poor vision can be repaired with laser surgery (surgery using a very strong beam of light instead of cutting instruments). This is different than the kind of surgery to treat cataracts and may be expensive. Before spending money, it is wise to talk to others who have used the same eye surgeon with good results.

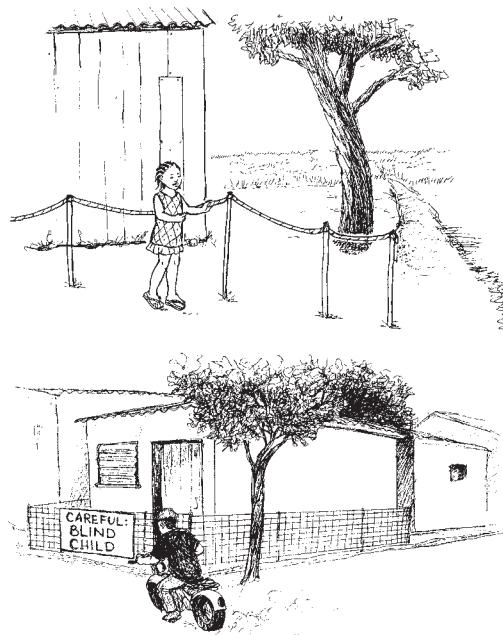
People with blindness or poor vision that cannot be improved

Sometimes a child is born blind or a person's poor vision cannot be improved with eyeglasses, surgery, or medicines.

People learn to live with blindness and poor vision. With support from family and community, people who are blind attend school, earn a living, and have their own families.

To make life easier and safer for a person with poor vision or blindness:

- Introduce yourself when speaking to the person, speak to him directly and let him know when you are walking away from him.
- Let him grasp your elbow when you walk together. You can alert him and lead him around any danger. This is a more respectful than pulling a person along by his hand or body.
- Create handrails or guide ropes to the latrine or other places the person goes to daily.
- Do not move furniture or other objects to a different place in the home, school or workplace. Alert the person if you do move something.
- Drive carefully in the area where a blind person lives. A bell on a cow or other animal warns a person who does not see.



Children with disabilities, including blindness, can be more at risk for abuse, including sexual abuse, than children who can see. They need family and community protection to keep them safe, especially while young.

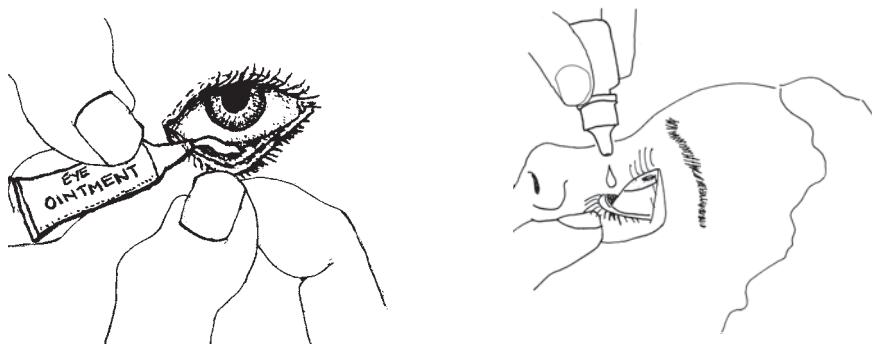
See the Hesperian book *Helping Children Who Are Blind* to learn more about how young children with vision problems can learn to take care of themselves, go to school, and lead good lives. Helping children to move about, understand the world around them and learn the skills they need is very important. See *A Health Handbook for Women with Disabilities* for ideas about how health workers, families, and communities can support everyone with disabilities to have better lives and better health.

Problems with the Eyes and Seeing: Medicines

How to use eye ointment or eye drops

Wash your hands before and after applying eye drops or eye ointment because many eye infections spread easily through touching a person's face and then your own eye. Eye drop bottles come with a seal. Help the person break the seal and show them how to squeeze out 1 drop.

To be effective, eye drops and ointment must go inside—not outside—the eyelid. Ointment will last longer in the eye and work well overnight but will blur vision temporarily making drops more convenient during the day.



To avoid spreading germs, do not let the tube or the dropper touch the eye.

To use eye ointment, gently pull down the lower eyelid and squeeze a thin line of ointment along the length of the eye, starting at the inner corner.

To use eye drops, pull out the lower eyelid to make a small pouch and gently squeeze 1 to 2 drops into it while looking up. Gently close your eye but try not to blink. Most of the drop will spread around the eye surface.

Common types of eye drops

Eye drops with antibiotics are used to treat an infection by germs (bacteria). Eye antibiotics also come as ointments. Antibiotic eye drops and ointments will not help irritated or red eyes caused by a virus.

Eye drops with antihistamines relieve watery, red, and itching eyes caused by allergies. Cold compresses on the eyes can help calm itching eyes and cost nothing.

Eye drops for lubrication, called “artificial tears” or “natural tears,” are used for eyes that feel dry. They can be used up to 4 times a day and at night just before sleep. Resting with warm compresses over closed eyes 1 to 2 times a day for 5 to 10 minutes can help your eyes make more of their own moisture.

Eye drops with natamycin are sometimes used by health workers to prevent fungal infections when there is an ulcer on the cornea.

Eye drops with tetrahydrozoline or naphzoline shrink the tiny blood vessels so the eyes look less red. Because they do not cure the cause of a red eye, they are a waste of money.

Important ▲

Eye drops with steroids (such as prednisolone or dexamethasone) reduce eye inflammation after surgery or from some other eye diseases. If used incorrectly, steroid eye drops can cause severe harm to the eye or may hide a problem that needs other treatment. Some drops mix antibiotics and steroids (often adding ‘Dex’ or ‘Pred’ to the name). Use eye drops with steroids only when specifically recommended by an experienced health worker.

Antibiotic eye treatments

Antibiotic eye treatments have the word “eye” or “ophthalmic” on the label to show they are safe for use in the eye. Do not use antibiotic skin ointments in the eyes.

Antibiotic eye ointment and antibiotic eye drops treat eye infections caused by bacteria and treat ulcers on the cornea. Erythromycin or tetracycline eye ointment is used at birth to protect a newborn baby’s eyes from infections that may pass at birth.

Common antibiotic eye treatments include:

- 1% tetracycline eye ointment
- 0.5% or 1% erythromycin eye ointment
- 0.3% ciprofloxacin eye drops or ointment
- 0.3% ofloxacin eye drops
- 0.3% gentamycin eye drops
- 10% sulfacetamide eye drops
- 0.5% chloramphenicol eye drops

How to use



For an eye drop or an eye ointment to work, it must be put inside—not outside—the eyelid. Show the person you are helping how to use them (see page 31).

FOR CONJUNCTIVITIS (PINK EYE) CAUSED BY BACTERIA

Use the antibiotic eye ointment or antibiotic eye drops 4 times a day for 7 days in both eyes. Even if the eye seems better, use the antibiotic treatment for all 7 days so that the infection does not come back. Sometimes it takes 2 days for the medicine to start working.

FOR AN ULCER ON THE CORNEA

Apply antibiotic eye drops every hour and send the person for help. The drops are applied every hour for 24 hours and then, if improving, drops are applied 4 times a day for 7 days. More advanced help is needed if the eye does not improve in 2 days. For an ulcer on the cornea, never use drops or ointment that contain steroids.

FOR TRACHOMA

If azithromycin pills (page 34) are not available, tetracycline antibiotic eye ointment can be used. Use 1% tetracycline antibiotic eye ointment in both eyes, 2 times a day every day for 6 weeks.

FOR NEWBORN BABIES TO PREVENT EYE PROBLEMS

Antibiotics are used to protect the newborn baby's eyes from infection that can pass to the baby during birth.

After gently wiping the eyelids with a cloth and water immediately after birth, use one of these antibiotic ointments with every newborn baby in both eyes within the first 2 hours:

1% tetracycline OR 0.5% to 1% erythromycin ointment Put a thin line of ointment in each eye, 1 time only, within 2 hours after the birth.

→ Gently pull down the lower eyelid and squeeze a thin line of ointment along the eye moving from the inside corner outward (see page 31). Do not let the tube touch the baby's eye and do not wipe the ointment away.

If there is no ointment, use:

2.5% solution of povidone-iodine

→ Put 1 drop in each eye, 1 time only, within 2 hours of birth.

Pull down the lower eyelid and squeeze 1 drop into this pocket (see page 31). Do not let the dropper touch the eye.

Azithromycin

Azithromycin is an antibiotic that treats many infections including trachoma, for which just 1 dose by mouth is needed. Where health authorities have campaigns to eliminate trachoma, azithromycin may be offered to the whole community to cure current infections of trachoma and prevent new ones at the same time.

How to use

FOR TRACHOMA

→ **Children 6 months and older, up to 40 kg.** To dose by weight: give at least 20 mg per kg by mouth in a single dose, but do not give more than 1000 mg (1 g).

For young children, liquid azithromycin is mixed to a strength of 200 mg/5 ml. For example, a child weighing 10 kg would take a single 5 ml dose (200 mg).

Give older children azithromycin by mouth. Pills usually come in 250 mg. It is safe to give a little more instead of dividing pills in half. For example, give 500 mg for children that weigh between 20 kg and 30 kg. Give 750 mg for children that weigh between 30 kg and 40 kg.

Programs distributing azithromycin often determine the dose based on the height of the child.

→ **Young people that weigh over 40 kg and adults (including pregnant women):** give 1000 mg (1 g) by mouth in a single dose. Taking 4 pills that each have 250 mg is the same as 1 g.

When azithromycin is given to the whole community for prevention, doses may be given once every year for 3 years.

If azithromycin by mouth is not available, trachoma can be treated with antibiotic eye ointment. Use 1% tetracycline antibiotic eye ointment in both eyes, 2 times a day every day for 6 weeks.

Vitamin A, retinol

Vitamin A prevents night blindness and xerophthalmia.

To get enough vitamin A, people need to eat enough yellow fruits and vegetables, dark green leafy vegetables, and foods such as eggs, fish, and liver. In areas where night blindness and xerophthalmia are common and eating enough of these foods is not always possible, give children vitamin A every 6 months.

Important

Do not use more than the suggested amount. Too much vitamin A from capsules, tablets, or oil can be dangerous. Do not give the regular adult dose of 200,000 U to girls or women who could become pregnant, or women in the first 3 months of pregnancy because this can harm a developing baby. For pregnant women, vitamin A is given in smaller doses more often instead of a single large dose.

How to use

Swallow pills or capsules. But for young children, crush tablets and mix them with a little breast milk. Or cut open capsules and squeeze the liquid into the child's mouth.

TO PREVENT VITAMIN A DEFICIENCY IN CHILDREN

As part of a prevention program:

- **6 months to 1 year:** give 100,000 U by mouth one time.
- Over 1 year:** give 200,000 U by mouth one time. Repeat every 6 months.

TO TREAT NIGHT BLINDNESS

If someone already has difficulty seeing or has other signs of night blindness, 3 doses are given. The first dose is given right away, the second is given one day later and the third dose at least 2 weeks later.

- For each of the 3 doses:
 - Under 6 months:** give 50,000 U by mouth in each dose.
 - 6 months to 1 year:** give 100,000 U by mouth in each dose.
 - Over 1 year:** give 200,000 U by mouth in each dose.
- **For pregnant women:** give 25,000 U by mouth weekly in pregnancy for 12 weeks. If she has continued signs of night blindness or another severe eye problem from lack of vitamin A, an experienced health worker may give a pregnant woman a larger dose.

FOR CHILDREN WITH MEASLES

Vitamin A can help prevent pneumonia and blindness – two common complications of measles.

- **Under 6 months:** give 50,000 U by mouth 1 time a day for 2 days.
- 6 months to 1 year:** give 100,000 U by mouth 1 time a day for 2 days.
- Over 1 year:** give 200,000 U by mouth 1 time a day for 2 days.

If the child has already received a dose of vitamin A in the last 6 months, give this treatment for one day only. If someone with measles is severely malnourished or already starting to lose her vision, give a third dose of vitamin A after 2 weeks.

20/200

20/120

6/60

6/36

20/80

6/24

6/18

6/12

20/10

6/9

6/6

Distance Vision Acuity Chart — for use at 3 meters (10 feet)

This box should measure 2cm x 2cm
when you print this page



Adapted from Matthew Smith, 2009
by Hesperian Health Guides

Heart Disease and High Blood Pressure

What Is Heart Disease?

Our bodies need a strong and healthy heart to pump blood through arteries and veins, the tubes that carry the blood from the heart to all parts of the body (arteries) and then back again (veins). If the arteries are blocked or brittle, not as much blood gets back to the heart, making it weak. And if the heart is too weak, it won't pump the blood well and has to work too hard.

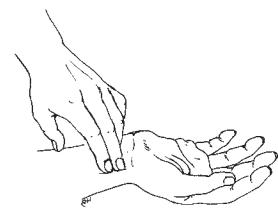
Because the blood carries oxygen and nutrients throughout the body, blood circulation and heart problems can affect the entire body. It is like a water system: if the pump works too hard, it may burn out; if it is too weak, not every household will get water; if the pipes are clogged, there is less water getting through; and in the homes that don't get water, there will likely be more illness.

Problems in the arteries and veins and problems with the valves inside the heart are all called **heart disease**. Common heart diseases (also called cardiovascular disease) include:

- **Hardening of the arteries (arteriolosclerosis):** When the arteries that carry blood from the heart throughout the body become stiff, narrow, or blocked—often from too much unhealthy food—not enough blood will return to the heart.
- **Congestive heart failure:** When the heart is not strong enough to pump the blood well, it is called heart failure. It harms the person because the blood does not get everywhere it is needed. With less blood flow to the body's organs, the person gets tired more easily. Lack of good blood flow can cause swelling in the legs and fluids to build up in the lungs.



The heart works day and night to pump blood through the body. Put your fingers on the side of your neck or on your wrist to feel the steady beat of your heart.



- **Heart attack:** When blood flow is blocked inside the heart, the heart muscle is damaged and becomes too weak to work properly. This is an emergency (page 19).
- **Stroke:** When blood flow to the brain becomes blocked or when a smaller tube, called a blood vessel, bursts inside the brain, the brain is damaged. This is an emergency (page 20).
- **Rheumatic heart disease:** This is caused when rheumatic fever damages a child's heart (page 22). Medicines or an operation can help.
- **Newborn heart problems:** When a child is born with a hole or other defect in his heart, it may cause problems only surgery can fix. These are called heart defects (page 23).

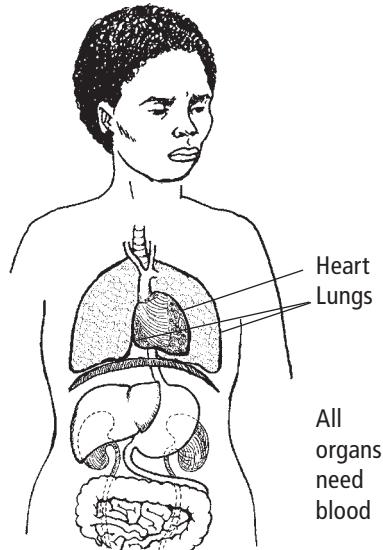
The heart moves blood through the body

The **heart** is on the left side of the chest. The heart pumps blood through tubes that carry it throughout the body and then back to the heart. If the heart stops pumping, the person dies. Blood moving through the body is called **circulation**.

The tubes are called **blood vessels**. There are 2 kinds: **arteries** go from the heart to organs and other body parts, and **veins** carry the blood back to the heart. When the blood goes through the **lungs**, it picks up oxygen from the air we breathe.

The heart is only the size of your fist. It is like a house divided into rooms.

Blood flows from one room (**chamber**) to another, through doors (**valves**) that open and close. Heart valves that are damaged or don't work well can cause heart problems.



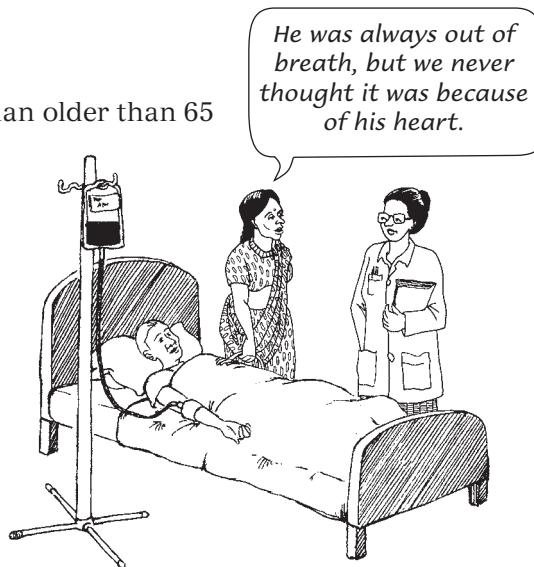
Who is more likely to get heart disease?

Most kinds of heart disease develop for a long time before any signs appear. But because certain conditions often lead to heart disease, it is easy to predict that a person with 2 or more of these conditions is more likely to have heart problems in the next few years:

- has blood pressure higher than 140/90 every time it is measured
- weighs too much
- has diabetes
- smokes tobacco
- is a man older than 55 or a woman older than 65

Health workers can encourage people with these conditions to check their blood pressure and get tests for diabetes and cholesterol levels (see page 16).

You can make heart problems less likely, and even improve heart problems you already have. Stop smoking, get treatment for diabetes, eat less salt and less processed “junk” foods, exercise more, and lower your stress. These changes will help your heart. Talk to your health worker and see page 9, Ways to lower blood pressure and help your heart.



A heart attack or stroke may seem to happen suddenly, but heart disease often starts when you are young and then gets worse over many years.

Heart disease and diabetes

Many people with diabetes also have heart problems. Diabetes often goes together with the conditions that make heart disease more likely: high blood pressure, high cholesterol, gaining too much weight, and not getting enough exercise. That is why everyone with diabetes should be checked for high blood pressure and everyone with high blood pressure should be checked for diabetes. Eating healthy foods, moving more, not smoking tobacco, and reducing stress make both conditions better. See the chapter on Diabetes for more information.

How to check the heart and circulation system

A health worker measures how well your heart is working by:

- **Measuring blood pressure** (page 6). This shows if your heart is working too hard to move blood around the body. When the blood pressure measurement is always high, this is a warning that you have or could develop heart disease or problems that can lead to a heart attack or a stroke.
- **Testing blood to measure cholesterol.** Cholesterol is a waxy liquid made in the body (page 16). The body needs some, but too much is a sign of heart problems to come.

Other signs that may show a heart problem, especially if you feel them often, are:

- Too fast, too slow, or always changing heartbeat (arrhythmia, page 17)
- Pain in the chest (angina, page 18)
- Trouble breathing or feeling short of breath
- Swelling in your feet and legs
- Trouble lying flat to sleep at night

Preventing heart disease

Most heart disease is caused by the foods we eat and how we live. We can control some of these choices, but many are not under our control. Are good housing or healthy foods available and affordable? Do jobs pay enough? Are there safe places to exercise and for children to play? Is there pollution or tobacco smoke everywhere? Does racism, poverty, harsh lives for women, or violence make our lives constantly stressful? This chapter describes how heart disease works, but it also shares ideas how individuals, families, and communities can prevent heart disease to live better and longer.

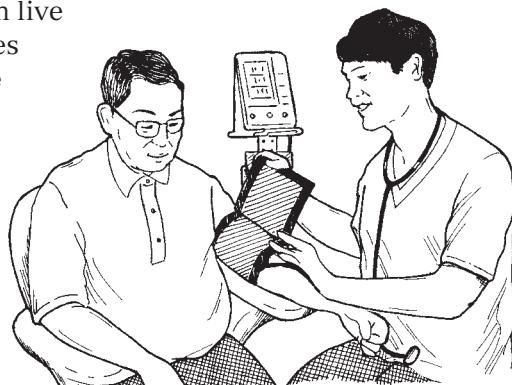


When children can play safely every day and have nutritious food to eat, they will have fewer health problems when they are older.

What is High Blood Pressure?

Measuring a person's blood pressure tells how much force is needed for the heart to move blood through the body and back to the heart. It is normal for blood pressure to go up and down during the day depending on exercise, eating, feelings, etc. But having high blood pressure most of the time is not healthy. High blood pressure (also called hypertension) is a sign that the heart is working too hard.

When people have high blood pressure, lowering it helps them live longer. Medicines are sometimes needed to lower blood pressure but high blood pressure can often be lowered by eating healthier foods, using less salt, and exercising. Quitting tobacco and alcohol also helps. And treating a person's diabetes will help their heart too. There are many ways to lower blood pressure (see page 9).



Sometimes there is no clear reason why a person has high blood pressure. As people grow older, their blood pressure gradually gets higher as their arteries stiffen with age. For some women, pregnancy increases blood pressure. High blood pressure can also run in families, meaning that if you have parents or other close relatives with this problem, it might be a problem for you too.

Measuring blood pressure

Usually blood pressure is measured by a “cuff” that tightens and then loosens around your upper bare arm, while your health worker (or the machine itself) listens to the blood flow above your elbow. Two numbers, written side-by-side or one on top of the other, show your blood pressure. The first (or top) number shows how hard the blood pushes when your heart is pumping. This is called systolic pressure. When the top number is more than 140, it is too high. The second (or bottom) number shows how hard the blood pushes when your heart is relaxed between beats. This is called the diastolic pressure. It is too high if it is more than 90.

A blood pressure measurement (BP) has two numbers:

It is usual for blood pressure to vary a little each time it is measured.

For most people, it is normal and healthy to have a blood pressure of no more than 120 as the top number and no more than 80 on the bottom. Blood pressure with even lower numbers is better for most people, but there are times when blood pressure can be too low (see page 8).

A person may feel nervous in a health clinic, causing her blood pressure measurement to rise. Have her relax a few minutes first, with both feet on the floor, and not speak while you take her pressure. If it seems high, measure her blood pressure more than once during the clinic visit. Also, having one high measurement does not always mean the person has a blood pressure problem. After a high blood pressure measurement, ask the person to come back to check it again in a few months, or sooner, depending on the measurement. To learn how to measure someone's blood pressure as accurately as possible, see Health worker skills (in development).



When blood pressure is too high

Blood pressure measured regularly at over 140/90 is considered high blood pressure. But if a person has other health conditions, her acceptable blood pressure numbers may be higher or lower. For example, it is normal for blood pressure to go up a little as people get older, and this may not be a problem for a person with no other health problems. If blood pressure is regularly more than 130/80 or is getting higher over time, try different ways to lower it (page 9) and continue checking blood pressure to see what works.

Usually, a person with high blood pressure will not notice any signs unless his blood pressure is very high. Unfortunately, no signs does not mean no harm. The only way to know if you have high blood pressure is to have it checked.

Very high blood pressure (hypertensive emergency)

Having the top (systolic) number around 180 or higher or the bottom (diastolic) number higher than 110 can be an emergency if the person also has one or more of these signs:

- Headache
- Blurred vision
- Chest pain
- Shortness of breath
- Blood in the urine, or side pain (kidneys)
- Seizures

Take the person to a clinic or hospital where medicines can be used to gradually bring down their blood pressure. Lowering blood pressure too quickly can cause harm.

High blood pressure and pregnancy

Health workers and midwives usually measure the blood pressure of pregnant women at every visit. It is common and healthy for a woman's blood pressure to be a little lower than usual during the first 6 months of pregnancy. A healthy blood pressure stays between 90/60 and 140/90 and does not rise much during pregnancy. High blood pressure during pregnancy causes less blood to circulate. This brings less food to the developing baby, so the baby might grow too slowly.



Blood pressure measuring between 140 and 150 for the top number or between 90 and 100 for the bottom number may be treated without medicines by having the woman rest more and lie on her left side. Signs of more serious health problems include shortness of breath, chest pains, or higher blood pressure. High blood pressure in pregnancy can be a sign of pre-eclampsia, an emergency that can lead to premature birth, bleeding, convulsions, and even death (see page 15 in the chapter Pregnancy and Birth).

When is blood pressure too low?

Blood pressure lower than 90 (systolic) over 60 (diastolic) is generally considered to be low blood pressure. Some people have no problems from low blood pressure. But if there is dizziness or fainting, low blood pressure may need treatment. Low blood pressure can be a sign of dehydration or other problems. It is important to find the cause of low blood pressure to treat it.

When blood pressure drops very quickly and there are other signs such as confusion, cold sweat, or a weak, fast pulse, this could be an emergency condition called shock. Once signs of shock begin, it usually gets worse very fast until the body shuts down completely. Treat shock quickly to save the person's life (see Shock, page 11 in the chapter on First Aid).

It is important to check your blood pressure

Anyone with a blood pressure measurement device can check blood pressure. Usually health workers check your blood pressure at every visit, but you may be able to check it at a pharmacy or a health promotion event in your community or workplace. Keep a record of your blood pressure to see if it changes over time.

Date	Blood Pressure
8 Sep	100/61
12 Oct	110/62
15 Nov	90/58
10 Dec	112/61
12 Jan	110/70
9 Feb	108/68

If you get a blood pressure device, you can learn to check your own blood pressure at home. Blood pressure equipment can be shared safely among people.

High blood pressure is a warning that heart disease might be developing or has already begun. Over time, the increased pressure damages the organs in your body and can lead to heart attacks, heart failure, strokes, kidney disease, and eye damage. When you learn to check your own blood pressure, you can see how exercise and healthy eating help your blood pressure improve.

Ways to Lower Blood Pressure and Help Your Heart

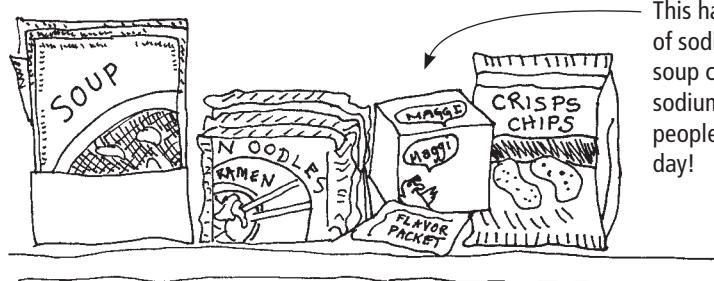


Eat lots of vegetables, fruits, legumes, and whole grains instead of processed, fried, salty, sugary or other “junk” foods. The chapter Good Food Makes Good Health has information on eating a variety of foods for better health and how to eat well when you have little money.

Limit the amount of salt you eat.

Read food labels to see how much salt (sodium) is in canned and packaged foods before you buy them. Processed foods in packages and cans can have too much salt even when they do not taste salty. Make your own meals with fresh foods and no salt. Flavor foods with lemon, garlic, onion, and herbs instead. Soy sauce, soup cubes, flavor packets, steak sauce, tomato ketchup, pickled foods, onion salt, and garlic salt usually have far too much salt to be healthy.

Instant noodles, instant soups, broth (consume), and food flavoring packets are filled with chemicals and salt (called sodium on many labels). All the ingredients are bad for you.



This has 2000 mg of sodium in each soup cube, more sodium than most people need in a day!

Keep a healthy weight. If you weigh too much, even losing a few kilos or pounds can lower your blood pressure. Sometimes eating less of the main starchy food (rice, maize, cassava) at each meal, cooking in ways that use less oil, or stopping soft drinks such as Coca-Cola and other sweet drinks will help you lower your weight a little without too much effort. You can get used to less sugar in your tea or coffee by using a little less each week.

Stop smoking. Smoking makes having a heart attack or stroke much more likely. Even after years of smoking, stopping can improve your health. For help to stop, see Drugs, Alcohol, and Tobacco (in development).

Limit alcohol. Drinking alcohol increases the chance of heart disease. Too much is drinking more than 1 or 2 alcoholic drinks a day.



Older people who walk every day and continue their daily activities as much as possible usually feel better and have better health.

Move your body — be active every day.

Walking briskly 30 minutes a day works well for many people. Walking or doing activities with others is safer and more fun. Activities that people do anyway, such as farming and gardening, cleaning, and playing outside with children, are all good ways to keep moving.

Feel less stress. Make yourself feel calmer.

Experiment to find what works best for you. Some people calm the body and mind with meditation, yoga, prayer, or other traditions. Others feel better after hard physical work or exercise. It often helps to build a relationship with another person or a group of people you can share your feelings with.

Join with others to help your health and the community's health.

Organize a group to share good ideas and activities that contribute to health. To reduce high blood pressure and heart disease in your community, adapt ideas about Community Action for Diabetes (see page 27 of the Diabetes chapter). For example, community gardening or sharing better ways to prepare food can prevent many future cases of heart disease and bring people together in ways that lead to other improvements for the community.

Tell me more about why you want to do something about your high blood pressure.

I'm afraid of getting too sick or dying while the children are young. But changing what we eat is hard. And vegetables are expensive for us.

What changes have you been able to make so far?

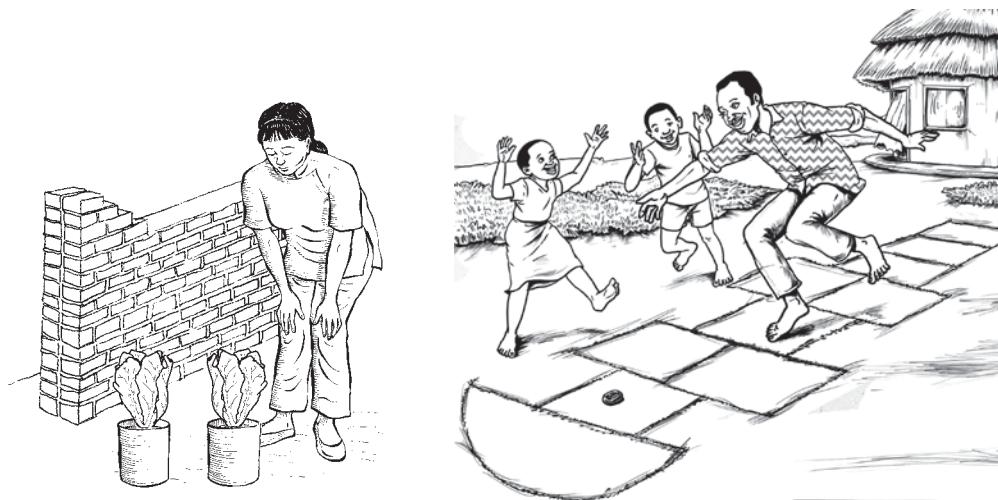
Well, now I walk a lot more.

Health workers can ask people what they are able to do and why they want to do it, instead of telling them what they should do. Nobody likes to be told what to do all the time.

If you have high blood pressure or a heart problem

Finding out you have high blood pressure or another heart problem is worrisome. As with diabetes, you can manage heart and blood pressure problems so they do not lead to ill health or an emergency, and you can feel better. Whether or not you need medicines for your heart problem, you will probably feel better when you move more and change what you eat. This is why some people decide that finding out about their high blood pressure, heart disease, or diabetes—and doing something about it—is like being given a second chance (see the Diabetes chapter, page 26).

Adapting to new foods and new situations is easier when everyone in the family helps and makes the same changes too. And it is easier to exercise and move more if you plan something fun to do regularly with family and friends, such as walking together on your errands or dancing. Work with others to reduce stressful situations when possible.



I have a small patio where I grow vegetables.

I play with my children every evening.

People come up with many creative ways to exercise more and eat healthy food. What will you do?

Care for older people in the community

In your community, there may be older people who need companionship and help with their health. Bringing older people together can help fight heart problems, diabetes, and the sadness people feel from being alone.

Some families have lived in Soweto, South Africa for many decades. But as younger people find work far away from Soweto, they sometimes must leave home and their older parents behind. To earn enough to live, those still in Soweto rent out space on their lot so migrants from rural areas can build rooms, one for each new family. Soweto is very crowded now and neighbors no longer see each other from yard to yard. Older people with problems such as diabetes and high blood pressure keep to themselves because they are scared to come outside among all the new people. Poverty, loneliness, and fear keep them from eating well, walking much, or getting health care. When community health workers at the local clinic went door to door, they discovered this problem and began to invite the older people to meet as a group. Soon they were meeting on their own without the health workers and taking walks together. They walk, talk, prepare food together, and share celebrations. Health workers still bring medicines to those who need it, but are finding that less medicine is needed now that people are exercising daily and enjoying life more.



Medicines Can Lower Blood Pressure

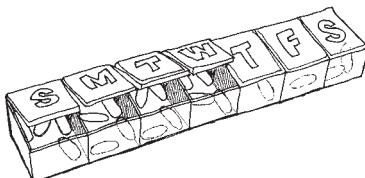
Nutritious food and more exercise improve health for most people with high blood pressure. Some people also need medicines to lower and control their blood pressure. If your blood pressure is high and you also have other health problems, taking medicine every day can prevent health emergencies.



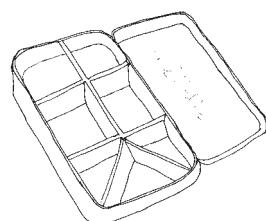
There are many blood pressure medicines. All of them work best when you take them every day. If you stop taking them, usually your blood pressure will go back up. When these medicines are necessary to live a long, good life, people can get used to taking them every day.

Some blood pressure medicines can cause uncomfortable side effects like having to urinate often, diarrhea, nausea, or a cough. Instead of just stopping the medicine, ask your health worker if there is another medicine that will work better for you. But if you get a rash or swelling, stop taking the medicine and talk to your health worker.

People may need more than one blood pressure medicine to control their blood pressure. For people taking more than one blood pressure medicine, it may help to take them at different times of the day.



Use a 7-day pill box to help you remember to take the pills every day. You can make your own. Refill it once a week.



The most common types of medicines used for high blood pressure are:

- **Diuretics (“water pills”) (page 29).** Examples are hydrochlorothiazide and chlorthalidone. They make you urinate more often. This leads to less fluid in the body and this makes blood pressure go down.
- **Calcium channel blockers (page 30).** These include amlodipine, nifedipine, diltiazem, and verapamil. They prevent blood vessels from narrowing and that helps lower blood pressure.
- **ACE inhibitors and ARBs (page 31).** Examples are captopril, enalapril, lisinopril, and losartan. They prevent the narrowing of blood vessels and this lowers blood pressure. These help protect your kidneys and are often used for people with diabetes who also need to lower their blood pressure.

- **Beta blockers (page 32).** Examples are atenolol, metoprolol, bisoprolol, and carvedilol. They make the heart beat a little slower so it pumps with less force and lowers blood pressure. When used to treat high blood pressure, beta blockers are used together with diuretics or other medicines.

There are many other less common medicines for high blood pressure.

When aspirin helps with heart problems

Aspirin, commonly used to lower fevers or reduce pain, also helps stop blood from clotting. People with certain heart conditions can take a low dose of aspirin once a day to avoid a heart attack or lessen the likelihood of a stroke. Low-dose aspirin usually comes as 75 mg or 81 mg tablets. If only regular strength tablets (300 or 325 mg) are available, you can use half a tablet (or use 1/4 tablet if they can be cut in 4 pieces).

Do not take aspirin if you have anemia, blood in your stools, or ulcers or if you have had an allergic reaction to aspirin.

Because aspirin can irritate the stomach if taken for many years, low-dose aspirin is usually given to people who are 50 years or older and then only if they are likely to develop heart problems.

A low dose of aspirin once a day can help a person who:

- already had a heart attack or stroke.
- has diabetes and is over 40 years old.
- has at least 2 of these health problems: high blood pressure, smokes tobacco, high cholesterol (page 16), or weighs too much.

WARNING SIGNS

Stop taking aspirin if you notice:

- blood in the stool.
 - dark black stools.
 - paleness or extreme tiredness (fatigue).
 - a rash, swelling on your face or body, or trouble breathing. These are common allergic reactions to aspirin.
- If you cannot get aspirin as low-dose tablets, cut a 300 mg or 325 mg tablet into 2 or 4 pieces. Take 1 piece every day.

If you develop any of these warning signs, you will need blood tests to see if another health problem requires treatment.



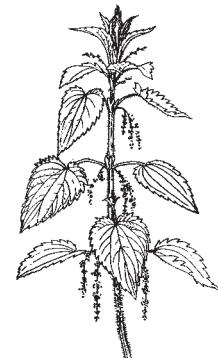
Some plant medicines may lower blood pressure

Plants that grow in your region may also be used to lower blood pressure. For example, stinging nettle (*urtica dioica*) leaves make you urinate more and reduce fluid in the body, a way to lower blood pressure. Hibiscus (*hibiscus sabdariffa*) can lower blood pressure and is found in many places. Hawthorn berries and flowers (*crataegus*) seem to improve cholesterol levels and lower blood pressure by improving blood flow in the body. However, hawthorn should not be used in pregnancy. Using garlic and turmeric in your food may help lower blood pressure as well.

Often these plant medicines are prepared as teas or extracts. Ask midwives, healers, and the older women in your community if they know about helpful plants and plant medicines, where they can be found or purchased inexpensively, how to prepare them, and how to use them without causing harm.

As with other medicines, take care when using plant medicines. Find out how much is the right amount to take, if it interacts with other plant or chemical medicines you may be taking, and if it is safe to use during pregnancy. Some plant medicines used to treat other conditions may raise blood pressure, so find out if a plant medicine you already take might be making your blood pressure high.

For most people with high blood pressure, neither plant medicines nor chemical medicines will do them much good if they do not get enough healthy food and exercise. Healthy food, clean water, basic safety, and good lives are most important.



Stinging nettles contain calcium, vitamin K, folic acid, and other important nutrients and may help with high blood pressure. They are safe in pregnancy. But cover your hands when you pick them or you will be stung!



Hibiscus is used all over the world to treat high blood pressure. Common names for this red flower include roselle, rosella, red sorrel, jamaica, chukor, and bissop. Prepare a tea by letting the dried flowers steep in hot water for 5 or 6 minutes. Drink a glass of the tea, warm or cold, 3 times a day, each day for 5 or 6 weeks. Continuing for longer will do no harm. Drinking this flavorful tea with little or no sugar is best because sugar makes heart problems, diabetes, and other conditions worse.

Cholesterol and Your Heart

Cholesterol is a waxy liquid with nutrients the body needs. Your body makes some cholesterol and gets more from the food you eat. But too much cholesterol can build up in your arteries, leading to high blood pressure, heart attacks, and strokes. Cholesterol does this by blocking blood flow, causing dangerous blood clots and swelling.

Cholesterol is measured through a blood test. There are 2 main types of cholesterol:

- LDL or “bad” cholesterol. When people are told they have high cholesterol, this means the LDL levels are too high.
- HDL or “good” cholesterol. This protects you from heart disease, heart attack, and stroke by taking bad cholesterol out of your blood.

Many things affect cholesterol levels. For example, the LDL (bad) cholesterol increases as people become older. Also, high LDL cholesterol seems to run in families. Often, you can lower bad cholesterol by:

- Limiting the amount and type of fats you eat. Instead of frying, cook meats and vegetables by boiling, grilling, or baking.
- Eating more fruits, vegetables, legumes, and whole grains helps because these foods have fiber that the body can use to lower bad cholesterol.
- Losing weight often improves cholesterol. Being heavy or overweight does not.
- Exercise may help with cholesterol. Sitting a lot does not.



Because cholesterol doesn't make you feel sick, a blood test to measure cholesterol (lipid panel) is the only way to know if you have this problem. People with diabetes may have more problems with cholesterol.

High cholesterol levels and what to do

High cholesterol becomes more dangerous when combined with other conditions that harm the heart, such as high blood pressure, too much stress, or diabetes. You can improve all of these problems with a healthier diet and more exercise (see page 9). But if you have made these changes and your cholesterol levels are still high, you may need medicines.

A type of medicine called statins stops the body from making more cholesterol and also removes the LDL (bad) cholesterol from the blood. One common statin medicine is called simvastatin (see page 34).

Statins are also given to people with diabetes and to people who have already had a heart attack or a stroke. For these conditions, statins can help prevent heart emergencies.

You should not take statins if you are pregnant or think you might get pregnant soon since they are dangerous to a baby in the womb.

Other Heart Problems

Irregular heartbeat (arrhythmia)

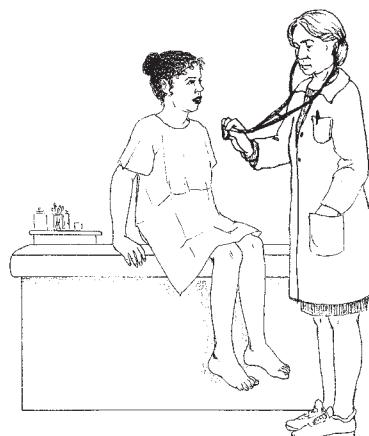
Almost everyone has felt a very fast heartbeat, a “fluttering” or pounding in their chest, or was startled and thought their heart “skipped a beat.” These changes in heartbeat are called irregular heartbeat or arrhythmia. Changes in heartbeat are common, especially as people get older, and they are usually harmless. But some arrhythmias happen often, are dangerous, and require treatment.

If the changes in your heartbeat happen too often, they may affect your heart enough that you will have other signs. See a health worker if you often feel heart palpitations (a fluttering feeling in the chest or neck), skipped beats, or if they happen with any of these signs:

- rapid or pounding heartbeat
- fatigue
- dizziness, lightheadedness
- fainting or near-fainting spells
- shortness of breath
- chest pain

Certain drinks, medicines, or drugs can cause or worsen an irregular heartbeat, including:

- caffeine, found in coffee, some tea, and some bottled or canned drinks
- nicotine, found in cigarettes and other tobacco products
- alcohol
- cold and cough medicines
- anti-arrhythmics. Though unusual, the same medicines used to treat arrhythmia can sometimes cause arrhythmia! Health workers should carefully monitor a person taking antiarrhythmic medicine.
- drugs such as cocaine, marijuana, and “speed” (amphetamines)



If you are being treated for irregular heartbeat and use any of these drinks, products, or substances, tell your health worker. They may be causing the problem, or they may make medicines to treat arrhythmia work differently.

Chest pain (angina)

Angina is the name for pain or discomfort in your chest. Angina may happen when you are more active or emotional than usual, and then go away when you relax. The pain is caused by narrowed or blocked blood vessels carrying blood to your heart.

Angina may feel like pressure or squeezing in your chest or shoulders, arms, neck, jaw, or back. Angina sometimes feels like indigestion. Your discomfort may be worse or you may also feel shortness of breath when walking, especially uphill.

Not all chest pain is a sign of heart disease. It could be something less serious, such as heartburn or indigestion. Take an antacid, and if that makes the pain go away, it is more likely the pain is from belly problems (see page 12 in the chapter on Belly Pain, Diarrhea, and Worms).

Pay attention to chest pain



Chest pain can be a sign of a heart attack (see box, page 19), although not all heart attacks cause chest pain. Chest pain can also be a sign of other serious conditions including lung infection, blockage of a blood vessel in the lung (pulmonary embolism), or the tearing of a major artery.

Because chest pain can be a sign of a heart problem, tests are usually needed to know if it is an emergency. Tests for heart problems given in a health clinic include blood tests, chest x-rays, or an EKG (electrocardiogram). In an EKG, wires taped to your chest measure how well your heart is working. None of these tests hurt. Treatment for chest pain might include changes in eating, medicines, or surgery.

If you sometimes feel pain in your chest and already know it is not an emergency, take notes about each time you feel the discomfort. Show these notes to your health worker. If you already take heart medicine, this information will help the health worker know how well it is working.

Include in your notes:

- The date and number of times you felt the chest pain that day.
- Anything that happened before the chest pain, such as exercising, feeling strong emotions, eating a large meal, going out in cold weather.
- If the pain was mild, somewhat strong, or severe.
- How long the pain lasted and if resting helped it go away.

The same changes in people's food and lives that help with heart disease are helpful for angina: stop smoking, eat less oily and fried foods, drink less alcohol or none at all, and reduce stress. Exercise is helpful, but if you get chest pain during exercise, talk with your health worker about what kind of and how much exercise is safe. Medicines used for angina include calcium channel blockers, beta blockers, aspirin, and a type of medicine called nitrates.

A heart attack is an emergency!

Both men and women have heart attacks. If blood flow to the heart is blocked for a long enough time, part of the heart muscle begins to die.

SIGNS

- Pressure, squeezing, tightness, burning, pain, or a full feeling in the chest
- The pain may spread to the neck, shoulders, arms, teeth, or jaw
- The pain usually comes on gradually, but sometimes can be sudden and intense
- Shortness of breath
- Sweating
- Nausea
- Feeling lightheaded



Chest pain is the most common sign of a heart attack for both men and women, but women often do not feel chest pain. Instead they feel shortness of breath, tiredness, nausea, vomiting, or back or jaw pain.

If you suspect someone is having a heart attack, give 1 tablet of aspirin right away (300 to 325 mg). Ask the person to chew it up and swallow it with water. Even if you are not sure the person is having a heart attack, aspirin will do no harm. If you have it, give nitroglycerin dissolved under the tongue (see page 35). Morphine helps with the pain and fear. Reassure the person and get help.

A stroke is an emergency!

When the blood moving through the body is blocked from reaching the heart, it hurts the heart muscle and can cause a heart attack (see page 19). When the blood is blocked from reaching the brain or a blood vessel bursts in the brain, this is called a stroke. With a stroke, the blood carrying nutrients and oxygen to the brain is blocked and parts of the brain stop working.

SIGNS

- **Face drooping.** Ask the person to smile, and see if one side is drooping. One side of the face may be numb, and the smile may appear uneven.
- **Arm weakness.** Ask the person to raise both arms. Is there weakness or numbness on one side? One arm drifting downward is a sign of arm weakness due to stroke.
- **Speech difficulty.** People having a stroke may slur their speech or have trouble speaking at all. To check, ask the person to repeat a simple sentence.



A person having a stroke may notice other signs including paralysis somewhere in the body, numbness or tingling, trouble walking, blurred vision, dizziness, severe headache, difficulty swallowing, or memory loss.

Time is important. If you suspect a stroke, get the person to a hospital right away. Hospitals can give treatment, especially within the first 3 hours of the stroke, and can tell you if the stroke's effects are serious.



After a stroke, physical and speech therapy can help the person to recover use of their body or speak clearly. Treatment may also include medicines for blood pressure, treatment of diabetes, and aspirin or other medicines that prevent blood clots. After a mild stroke, the person may recover quickly. But a mild stroke is a warning that a person needs treatment to prevent another stroke that could cause serious and lasting damage.

Congestive heart failure

Congestive heart failure is a condition in which your heart is weak and beats with too little force to move your blood around well. This makes extra fluid collect in the lungs, legs, and other parts of the body. This makes you weak and, without treatment, eventually can cause death. But treatment can improve how well the heart works, make you feel better, and increase how long you live.

SIGNS

- **Excessive tiredness and weakness.** When your heart does not pump with enough force, your muscles do not get enough oxygen. You feel more tired.
- **Shortness of breath.** Breathing is more difficult when there is fluid in your lungs. You may have difficulty breathing, especially when lying flat at night, and you may cough a lot. Your breathing may make a whistling sound.
- **Swelling (edema).** Swelling from too much fluid can happen over a few days, or sometimes more gradually. You may have swelling in your feet and ankles and your clothes or shoes may feel tighter. This kind of swelling does not go away after lying down.
- **Swelling in the abdomen.** Your liver may be swollen and feel bigger to a health worker doing an exam. Your belly may fill with liquid.
- **More frequent urination.**



Swollen legs, called edema, can be a sign of congestive heart failure.

TREATMENT

- Eat less salt. Cook without much salt, add no salt to the food once it is prepared, and avoid canned foods, processed foods, or junk food like chips or crisps. Processed foods often have a lot of salt (sodium) even if they do not taste salty.
- Medicines that help drain excess water from the body include “water pills” (called diuretics). Someone taking these medicines may need to eat plantains, bananas, oranges, lemon, or avocado daily to replace the potassium that some diuretics take out of the body.
- Beta blockers, such as metoprolol, bisoprolol, and carvedilol, are also used to treat congestive heart failure. They need to be started at very low doses and increased slowly, especially if your blood pressure is already low. Work closely with your health worker.
- ACE inhibitors, such as captopril, enalapril, or lisinopril, are also used to treat congestive heart failure. Some people get a cough from these medicines and should talk with their health worker to see if a different medicine would work better.

Rheumatic heart disease

Rheumatic heart disease affects mostly children and young adults. It is usually caused by untreated strep throat developing into rheumatic fever (see the chapter Caring for Children, page 21). Rheumatic fever often starts with pain in the joints, shortness of breath or chest pain, and uncontrolled or jerky movements. This needs immediate treatment with antibiotics. Without treatment, rheumatic fever causes infection and scarring in a heart valve. This blocks the valve and it no longer works well, like a little doorway that won't open much. The heartbeat becomes weaker and the person does too. This permanent damage is called rheumatic heart disease. If the heart valve damage is not stopped or repaired, the person can die.

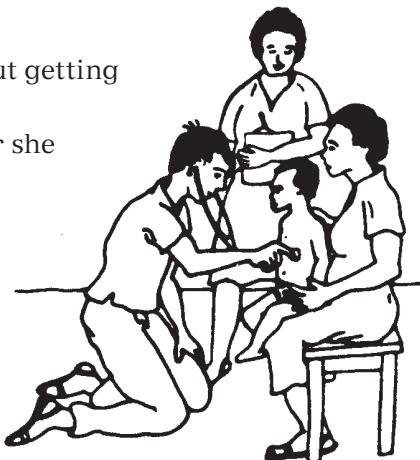
SIGNS

- A young person cannot walk 100 meters without getting out of breath.
- A child needs to sleep propped up by pillows or she cannot breathe.
- Using a stethoscope, a trained health promoter hears an abnormal heart murmur (the sound of blood moving through the damaged heart valve).

TREATMENT

- The health worker injects benzathine penicillin G once a month to prevent infections from returning and further damaging the heart. Do this at least until a child turns 18 years old.
 - If the heart is damaged, a valvuloplasty is a simple operation that opens a narrowed heart valve by inserting a thin tube (catheter) into an artery that leads to the heart valve. The blockage is opened by inflating a tiny balloon through it. If the rheumatic heart disease is more advanced, a more complicated operation can repair it.
- Treat strep throat with antibiotics to prevent rheumatic fever. If a child does get rheumatic fever, he needs treatment every month to prevent heart damage.

Pregnancy and childbirth make the heart work hard. If a woman who had rheumatic fever or rheumatic heart disease gets pregnant, an experienced health worker should check her heart to see if the pregnancy might be dangerous for her. The health worker will also make sure any heart medicines the woman takes are not harmful in pregnancy. It will be safer to give birth in a hospital.



Rheumatic heart disease happens mostly to malnourished children in rural areas living in poverty and in overcrowded conditions, without access to safe water or sanitation, medicines, or health care. In countries that have addressed these conditions even partially, rheumatic heart disease has almost disappeared.

Babies born with heart defects

Babies born with badly formed hearts sometimes die right after birth. Other problems, like a tiny hole between two sections of the heart, may sometimes go away without treatment. Many heart defects are serious but can be treated with operations or medicines. Some countries have special programs that offer heart operations for children at no cost.



SIGNS A BABY MAY HAVE A HEART PROBLEM

- Very fast breathing.
- A baby that is not feeding.
- A heartbeat that is too fast or too slow.

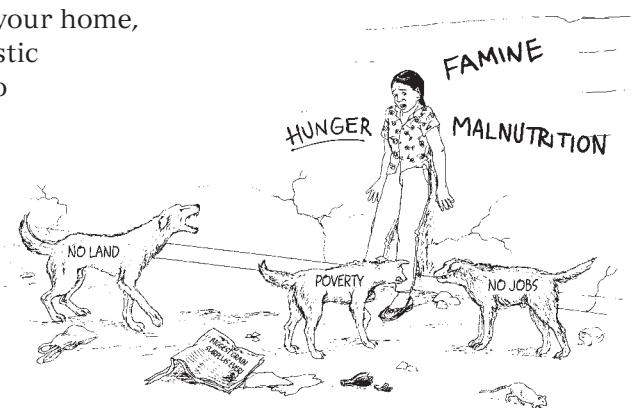
Using a stethoscope, a health worker listens to the baby's heart for a heart murmur or too-fast heartbeat. An x-ray may be used to show the shape of the heart. An EKG, a test to measure the pattern of the baby's heartbeat, may be needed.

Sometimes heart problems are found in older children or young adults. The cause is often a heart defect or rheumatic heart disease that was not treated (see page 22).

Poverty and Inequality Hurt the Heart

Heart disease, high blood pressure, and diabetes are making people's lives more difficult and causing more deaths, both in low-income countries and in richer countries. These changes are mostly caused by an economic system that increases inequality, forces people who are poor to spend even more to live, and allows unhealthy foods and sweet drinks made by big businesses to become more common than food grown or prepared locally. Poverty often forces people to live in crowded conditions, with polluted air or water, with no safe places to walk or play. All this results in more heart disease and diabetes. These illnesses are worse for people who are poor and cannot get the health care or medicines they need.

Being denied equality or opportunities to make your life better is not just unfair, it harms your health. It may keep you from eating well, make you choose between a dangerous job or no job at all, evict you from your home, or leave you facing domestic violence. And if you try to change these conditions, you may face violence from the police. These difficult situations cause stress. Stress means both how we feel—sadness, worry, fear—and also how our bodies react when dealing with difficult situations.



Difficult situations cause stress

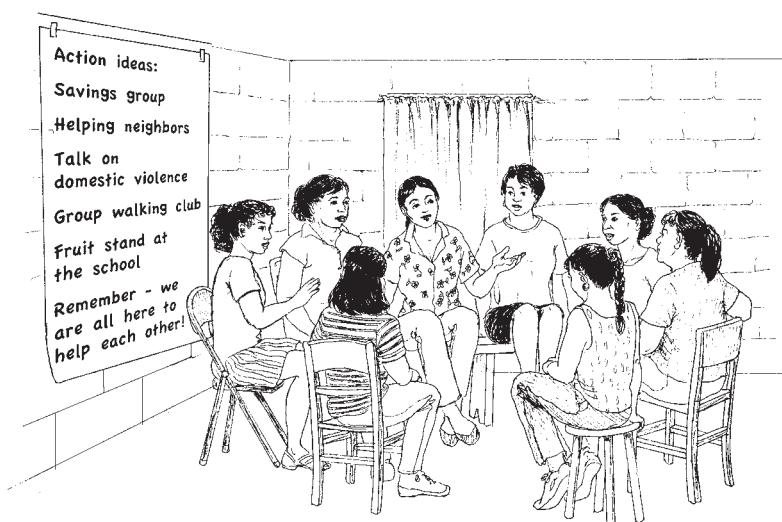
When problems arise, we feel stress. Stress can cause a physical reaction in the body such as fast heartbeat, sweaty palms, or feeling faint. These changes happen because the body changes the natural substances (hormones) it releases in response to something that scares or worries us. On the positive side, hormones alert our bodies to run from danger or fight an attacker. Stress hormones and their effects go away quickly if the cause of the stress goes away. But for people who are stressed all the time, their bodies never get a chance to recover, the effects of stress build up, and they are sick more often. Even when we become used to living with difficult situations and notice the stress less, it can still harm our bodies.

Stress can seem never-ending and overwhelming. Stress caused by living in a war, moving to a new place and not knowing the language or customs, family or relationship problems, housing or employment problems, fear for your safety, racism and discrimination—it all troubles the mind and wears down the body. You become less able to fight infection and illness and more likely to have health problems. Women and men who are always stressed are more likely to have heart disease and diabetes compared to those whose lives are not so difficult.

Stress—and the illnesses it causes—is a result of injustice and inequality. Working to change that is important to improving health.

People working for change help others and feel better

Creating strong community groups to solve problems of violence against women, better education for children, equality of services from city governments, or whatever important problems your community is facing, can reduce stress. This is not easy to do. But with patience and hard work communities bring about changes that improve life. See *Health Actions for Women, A Community Guide to Environmental Health, Workers' Guide to Health and Safety* and other Hesperian resources for ways to improve health by working on the problems facing your community.



Fighting poverty, discrimination, violence, and isolation helps make living conditions better and jobs less dangerous. Working for change with others makes us feel more powerful, part of something bigger, and more connected to others. These feelings can relieve stress.

Getting junk food out and healthy food and exercise in

Communities and governments have to pay attention to why people do not get enough exercise, why it is hard to find fresh and healthy foods, and why junk foods are everywhere and often inexpensive. Some ways a community can work on this are:

- Increase taxes on cigarettes and sweet drinks like *Coca-Cola* so people will buy less of them. Then fewer people will have problems with weight gain, diabetes, and heart disease.
- Plant a school garden to provide nutritious food. Stop vendors from selling unhealthy foods near school property. This changes what children eat and also what they are used to eating.
- Calm traffic so it is safer to walk to school, work, and the market. Make it easier and safer to get more exercise.
- Increase access to parks and other areas where people can play sports, dance, walk, or exercise with others.

When people work together for change they feel less alone and feel less stress. And that is good for the heart.

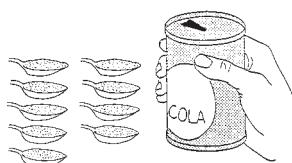


Save your money for nutritious foods.
Some foods make your body strong, but
other foods just make big companies rich.



Tax the companies that make us sick

Many countries are now taxing sugar-sweetened drinks because they damage teeth, make people weigh too much, and lead to problems such as heart disease and diabetes. Money from the taxes are often used for health or education. In Mexico, drinks made by Coca-Cola and Pepsi were so common that children drank them for breakfast. Now more people are dangerously overweight in Mexico than anywhere else in the world, and diabetes is increasing. But since taxes on these sweet drinks started in 2014, every year the companies sell less of them and Mexicans are more aware of how advertising and businesses affect their health.



A can of cola has more than 9 spoonfuls of sugar.
A 2-liter bottle can have more than 70 spoonfuls!



Change the message!

Be creative to get people talking and thinking about the harm of unhealthy products and who benefits from their sales. For example, make people take notice by changing an advertisement you have seen in a newspaper or on a billboard. You can share a new idea, expose an ugly truth about the product, or make the viewer feel the opposite of what the advertiser intended. It can be as simple as taping a new caption on an advertising flyer. Take a photo of it to show others or post it online. Or make an internet image with a caption (meme) to promote health and social justice. Hesperian's *Health Actions for Women: Practical Strategies to Mobilize for Change* has ideas about group activities used in many different countries that you can adapt to the health issue that is important to your community.



Medicines for Heart Problems

Types of blood pressure medicines

Medicines for high blood pressure work a little differently in each person and each person's heart problem can be different. When health workers treat high blood pressure and other heart problems with medicines, they usually start with a low dose. Depending on how well it works for that person and whether blood pressure goes down enough, the medicine is adjusted to make the dose a little more or a little less. Another medicine might be added to the first, or used instead of the first. When blood pressure readings are at normal levels, that means you are taking the right dose and type of medicine or medicines for your condition and this is called having your blood pressure controlled or under control. When starting treatment, get blood pressure checked every few weeks.

Health workers also monitor the side effects, if any, the medicine causes, and know if the medicine can be easily found and if it is affordable or free. If the person stops taking the medicine because of side effects or the cost, the health worker can work to find a solution.

Common medicines to treat adult high blood pressure include:

1. Hydrochlorothiazide (HCTZ) or another diuretic ("water pills")
2. Amlodipine or another calcium channel blocker (the names of these often end with -dipine)
3. Captopril, enalapril or another ACE inhibitor (the names of these often end in -pril)
4. Losartan or another ARB (the names of these often end in -sartan)
5. Atenolol or another beta blocker (the names of these often end in -lol). When beta blockers are used to treat high blood pressure, they are used in combination with other medicines.

There are also medicines that combine 2 heart medicines in 1 tablet. These may be more expensive than buying each separately, but may be more convenient.

Important

Learn from experienced health workers which medicines can be combined. Learn the best starting dose for each medicine when the person has another condition along with high blood pressure, such as congestive heart failure, high cholesterol, diabetes, or kidney problems.

For a person over 60 taking high blood pressure medicines for the first time, start with the lowest dose.

If medicines do not seem to be working, look for kidney disease, problems taking the right dose, what other medicines or drugs they take, or thyroid problems.

Diuretics ("water pills")

Hydrochlorothiazide (HCTZ), chlorthalidone, spironolactone, bendroflumethazide, triamterene, and furosemide are diuretics.

Diuretic medicines help the kidneys get rid of extra fluid and sodium by causing the person to urinate more often. With less fluid in the body, blood pressure goes down. Some diuretics also make the blood vessels become wider to reduce blood pressure. Diuretics are sometimes used to treat the swelling (edema) from congestive heart failure if the health worker can monitor with lab tests how it is affecting the body.

Side effects

Dizziness, frequent urination, headache, feeling thirsty, muscle cramps, and upset stomach. Most people take diuretics in the morning to avoid urinating frequently at night.

Important

Pregnant women should not use diuretics unless other medicines do not control their blood pressure.

Danger signs: severe rash, problems breathing, problems swallowing, and intense joint pain, especially in the feet. Get help right away.

How to use

Diuretics such as HCTZ, chlorthalidone, and furosemide take potassium out of the body. Eat plantains, bananas, oranges, lemon or avocado often to replace the potassium. If a blood test shows that potassium levels are low, some people will need potassium pills. Spironolactone and triamterene keep the potassium in the body. They are sometimes used in combination with the other diuretics to keep the potassium level normal but need more caution if used together with ACE inhibitors or ARBs.

Diuretics also take magnesium out of the body. Eat greens, yogurt, and squash seeds to replace magnesium.

Potassium levels and kidney function should be checked with lab tests a few weeks after starting diuretics and then every 6 to 12 months if you are taking hydrochlorothiazide, and even more often if you are taking furosemide. Furosemide is a stronger diuretic and the person needs to be monitored closely.

HYDROCHLOROTHIAZIDE (HCTZ)

Hydrochlorothiazide comes in 25 mg and 50 mg tablets.

For high blood pressure

→ Adults: The usual starting dose is 12.5 mg, 1 time each day in the morning.

If necessary, the dose can be increased to 25 mg each day after a few weeks if the blood pressure is not controlled with the lower dose.

Do not take more than 25 mg in one day. Taking more does not lower your blood pressure, it only increases side effects.

Calcium channel blockers

Amlodipine, nifedipine, diltiazem, and verapamil are calcium channel blockers.

Calcium channel blockers prevent calcium from entering the blood vessels and the heart. This relaxes the blood vessels, helping lower blood pressure.

They are also used for chest pain (angina).

People with diabetes can take calcium channel blockers.

Side effects



Amlodipine and nifedipine can cause ankle swelling. Prevent swelling by avoiding salty foods, exercising, and keeping legs elevated when sitting. If swelling continues, you may have to change medicine.

Minor side effects such as a mild headache, feeling drowsy, or upset stomach sometimes go away a week or two after starting the medicine. Talk to your health worker about changing the medicine if side effects continue.

Important !

Not all calcium channel blockers can be used during pregnancy.

People with some types of congestive heart failure and some other heart conditions should not use calcium channel blockers.

People taking calcium channel blockers while also taking statins (page 34) will need a lower dose of statins.

Danger signs: severe rash, chest pain, fainting, irregular heartbeat, swelling of any part of the face, mouth, arms, or legs. Get help right away.

How to use



AMLODIPINE

Amlodipine comes in 5 mg and 10 mg tablets.

For high blood pressure

→ Adults: The usual starting dose is 5 mg, 1 time each day.

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased to 10 mg.

Do not take more than 10 mg in one day.

ACE inhibitors and ARBs

Angiotensin-Converting Enzyme (ACE) inhibitors and Angiotensin Receptor Blockers (ARBs) are two types of medicines that act in similar ways. Both types are used for lowering high blood pressure, for congestive heart failure, for other kinds of heart disease, and to help protect the kidneys of people with diabetes.

ACE inhibitors and ARBs block the substance in the blood that makes the blood vessels tighten and narrow. When the blood vessels relax and widen, blood pressure goes down.

Captopril, enalapril, lisinopril are ACE inhibitors. Losartan is an ARB.

Side effects



ACE inhibitors can cause a dry cough. If you get a dry cough, switch to an ARB, such as losartan, which does not cause coughing.

Other possible side effects: rash, dizziness, feeling tired, headache, problems sleeping, or fast heartbeat.

Important ▲

Do not give to pregnant women or to women who may become pregnant. ACE inhibitors and ARBs are dangerous for a developing baby.

Avoid use in people with severe kidney disease.

Avoid ibuprofen and other anti-inflammatory medicines when taking ACE inhibitors or ARBs.

Danger signs: chest pain, problems breathing, problems swallowing, swelling of any part of the face, mouth, or legs. Get help right away.

How to use



ACE inhibitors and ARBs increase potassium. A blood test should be done a few weeks after starting an ACE inhibitor to monitor the health of the kidneys and the level of potassium. This is especially important if the person has even mild kidney disease. Use extreme caution and monitor the potassium levels through blood tests carefully if the person is also taking one of these diuretics: spironolactone or triamterene.

CAPTOPRIL

Captopril comes in 25 mg and 50 mg tablets

For high blood pressure

- Adults: When captopril is used by itself, without other heart medicines, the usual starting dose is 25 mg each day, divided in half and taken 2 times a day (12.5 mg each time).

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased. The next dose to try is 50 mg each day, divided in half and taken 2 times a day (25 mg each time). If necessary, this can be increased to a dose of 100 mg each day, divided in half and taken 2 times a day (50 mg each time).

If captopril is used with diuretics or the person is age 60 or older, then the starting dose is 12.5 mg each day, divided in half, and given 2 times a day (6.25 mg each time).

Do not take more than 100 mg total in one day.

ENALAPRIL

Enalapril comes in 2.5 mg, 5 mg, 10 mg and 20 mg tablets

For high blood pressure

→ Adults: When enalapril is used by itself, without other heart medicines, the usual starting dose is 5 mg each day.

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased. Most people do well with a dose between 10 mg to 20 mg each day. When the dose is 10 mg or more, it works better if the dose is divided in half and given 2 times a day.

If enalapril is used with diruretics, the person is age 60 or older, or has mild kidney disease, start with 2.5 mg per day.

Do not take more than 40 mg in one day.

LOSARTAN

Losartan comes in 25 mg, 50 mg, and 100 mg tablets.

For high blood pressure

→ Adults: When losartan is used by itself, without other heart medicines, the usual starting dose is 50 mg each day, either 1 time each day, or divided in half and taken 2 times a day (25 mg each time).

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased to 100 mg each day, either 1 time each day, or divided in half and taken 2 times a day (50 mg each time).

If losartan is used with diuretics, then the starting dose is a total of 25 mg taken 1 time each day.

Do not take more than 100 mg in one day.

Beta blockers

Beta blockers slow the heartbeat so the heart pumps with less force, resulting in lower blood pressure. If taken every day, beta blockers help lower high blood pressure and can help with chest pain (angina). Beta blockers are usually used together with diuretics or other medicines when taken to lower blood pressure. Some beta blockers are used to treat congestive heart failure.

Atenolol, metoprolol, bisoprolol, and carvedilol are beta blockers

Side effects



Feeling tired, upset stomach, headache, dizziness, constipation, diarrhea, feeling lightheaded.

If these are mild, they will sometimes go away after a few weeks of using the medicine.

Important

Not all beta blocker medicines may be used during pregnancy.

People with diabetes should use beta blockers with caution if they are having episodes of low blood sugar.

Beta blockers can make asthma worse, so people with asthma should use with caution.

Beta blockers can also lower the pulse. Reduce the dose if the pulse is less than 60 beats per minute.

Danger signs: chest pain, problems breathing, slow heartbeat, swelling in the hands, feet, or legs.

How to use

These medicines should be started at a low dose and gradually increased every 1 or 2 weeks. If you are taking a high dose of these medicines and need to stop them, they should be slowly decreased over a few weeks.

ATENOLOL

Atenolol comes in 25 mg and 50 mg tablets

For high blood pressure

- Adults: the usual starting dose is 25 mg 1 time each day.

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased by adding 25 mg more for a total of 50 mg each day. Measure the blood pressure again and repeat the increase if necessary after 2 more weeks (to 75 mg, 1 time each day), and again in 4 weeks (100 mg ,1 time each day).

Do not take more than 100 mg in one day.

METOPROLOL TARTRATE

Metoprolol tartrate is a short-acting medicine that is taken 2 times a day. It is a different medicine than metoprolol succinate which is long-acting.

Metoprolol tartrate usually comes in 50 mg and 100 mg tablets

For high blood pressure

- Adults: the usual starting dose is 50 mg to 100 mg each day, divided in half and taken 2 times a day (25 mg or 50 mg each time).

After a few weeks, measure to see if blood pressure is controlled. If necessary, the dose can be increased by adding 50 mg to the amount per day. Measure the blood pressure again and repeat the increase if necessary after 2 more weeks. The usual dose is 200 mg to 400 mg each day, divided in half and taken 2 times each day (100 mg to 200 mg each time).

Do not take more than 400 mg in one day.

Statins

Simvastatin, lovastatin, atorvastatin, and pravastatin are statins.

Statins make a person's liver produce less cholesterol. Too much cholesterol limits blood circulation and makes it harder for the heart to pump.

Statins are used to prevent heart attacks and strokes in persons who have already had one. They are also used to prevent heart emergencies in people with diabetes or other health problems that make a heart attack or stroke more likely.

Statins are very helpful for people who have these severe problems. They are also given to people to lower unhealthy levels of cholesterol.

There are moderate intensity statins (such as simvastatin) and stronger high intensity statins (such as atorvastatin) used for people with higher risk of a heart attack.

Side effects

Statin medicines can cause muscle pain. When this is mild and not all over the body, the dose can be lowered to limit the discomfort. But if the muscle pain is severe or is felt all over the body (like having the flu), stop taking the statin and see a health worker.

Minor side effects such as a headache, upset stomach or constipation are common and often go away after the body becomes used to the medicine.

Important

Statins should not be used during pregnancy and are not usually given to women who could become pregnant.

Some statin medicines should not be mixed with other medicines. Sometimes combining medicines changes the dose of one or both. For example, people taking amlodipine, cannot take more than 20 mg of simvastatin. Be sure to tell your health worker about all the medicines you are taking so she can check for drug interactions.

Danger signs: severe muscle aches or muscle aches that affect the whole body. Stop taking the statin medicine and see a health worker.

How to use

Statins are usually started at a moderate dose and decreased if there are side effects. This is different than some high blood pressure medicines where a lower dose is tried first and then slowly raised.

Statins work best if taken before going to sleep.

SIMVASTATIN

Simvastatin comes in 5 mg, 10 mg, 20 mg and 40 mg tablets.

To lower cholesterol for people at high risk of heart attacks

→ Adults: The usual starting dose is 20 mg, 1 time each day.

Most people will have a dose of 10 mg to 40 mg. When combined with certain medicines, the amount of simvastatin will be lower. It is important to know about all the medicines a person is taking before starting simvastatin.

Do not take more than 40 mg in one day.

Medicines for Heart Attack

If you suspect someone is having a heart attack, give 1 tablet of aspirin right away (300 to 325 mg). Ask the person to chew it up and swallow it with water. Even if you are not sure the person is having a heart attack, aspirin will do no harm. On the way to a hospital, give nitroglycerin if you have it.

You can also give morphine to help with the pain and fear, and make it easier for the heart to pump. There is more information about morphine on page 85 of the chapter on First Aid.

Nitroglycerin (Glyceryl trinitrate)

Nitroglycerin is used to treat chest pain from a heart attack. It helps to widen the blood vessels making it easier for the heart to pump blood.

Important

Do not give nitroglycerin to someone with low blood pressure or who has taken sildenafil (*Viagra*) in the last 24 hours. This combination of medicines can cause blood pressure to drop dangerously low, and can be deadly.

Side effects

May cause severe headache, feeling hot, or dizziness.

How to use

The person should sit or lie down, not stand up, in case they get dizzy.

- Give $\frac{1}{2}$ mg (0.5 mg) dissolved under the tongue, no more than 3 times, waiting 5 minutes between each tablet. If the chest pain and other signs go away, another tablet is not needed. Do not chew or swallow nitroglycerin tablets. As the tablet dissolves under the tongue, it tingles or even burns a little.

Belly Pain, Diarrhea, and Worms

Everyone gets pain in the belly, nausea, vomiting, constipation, or diarrhea at one time or another. Most belly problems make you feel bad but are not dangerous. If pain or nausea is not severe, wait a few days and see if it gets better. It usually will.

Belly problems can be caused by many things. For example, someone may have a belly ache because of a cold or flu, because she ate bad food, or because she is worried about her children. Every cause requires a different kind of help. (Giving tablets for pain will do nothing to cure any of these causes!)

But the cause of diarrhea, belly pain, or nausea may not be clear. As with all health problems, understanding the cause of the problem is the key to treating it. Begin by asking questions about the general problem, such as diarrhea, and then ask questions to help you learn more.



! Danger Signs

Some belly problems are dangerous and should not wait to be treated:

- Severe pain that gets worse and worse (page 8)
- Severe pain when you touch the outside of the person's belly (page 8)
- Diarrhea in small children or people who are malnourished (page 25)
- A very large amount of watery diarrhea (cholera, page 28)
- Diarrhea with blood (dysentery, page 30)
- Vomiting that goes on for more than 1 day and 1 night (page 24)
- Black stools that look like tar (caused by bleeding in the stomach or upper intestines, page 38)

Questions to ask if there is pain



? Are there bowel movements?

→ **Severe pain that gets worse is very dangerous!** This is called acute abdomen. Act fast. See page 8. You may need to go to a hospital.

→ A woman with these signs could have a serious pelvic infection (see page 16) or an ectopic pregnancy (see page 10).

? Is there pain with nausea and vomiting?

→ This may be from eating spoiled food. Drink plenty of fluids, like rehydration drink. See page 22.

? Does the pain come after eating? Is there a burning feeling in the chest or belly?

→ This may be heartburn, or it may be an ulcer. See page 12.

→ It could also be a gallbladder problem. See page 14.



? Is there pain on one side of the back? Does it "wrap" around the body to the groin?

→ This could be a kidney stone. See page 17.

Questions to ask if there is diarrhea

Diarrhea is explained starting on page 25. The most important treatment for all diarrhea is drinking fluids. As soon as possible, the person should eat food too.

? Has there been a lot of watery, painless diarrhea in a short time?

→ A very large amount of watery diarrhea could be cholera. So much diarrhea can quickly weaken or kill a person. Helping him drink constantly and eat as soon as possible can save his life. See page 28.

? Is there blood in the diarrhea (called dysentery)?

→ Dysentery is treated by drinking fluids. Antibiotics can be of use too. See page 30. Other causes of red blood in the stool are explained on page 38.

? Is the diarrhea frothy and smelly?

→ This could be giardia. Drink fluids. Antibiotics might be helpful. See page 31.

Is the person farting a lot?

? For how long has the diarrhea been going on?

→ Certain germs, such as giardia or amebas, tend to cause long-lasting diarrhea. But diarrhea might also last a long time because the person has another health problem such as:

- Malnutrition – best treated by providing more foods with protein. See page 20 in Good Food Makes Good Health.
- Problems digesting milk. See page 6 in Good Food Makes Good Health.
- A long-lasting illness, especially HIV. See HIV and AIDS (in development).

? Does the person have other signs of sickness – such as ear pain, fever, or a rash?

→ Diarrhea with fever and vomiting may be typhoid. See Some Serious Infectious Illnesses (in development). Diarrhea in children is sometimes caused by an infection in another part of the body and will go away when that infection heals. For:

- ear infection, see page 18 in Caring for Children .
- malaria, see Some Serious Infectious Illnesses (in development).
- measles, see page 22 in Caring for Children.

Questions to ask if there is diarrhea continue on next page →

Questions to ask if there is diarrhea (continued)

- ? Is the person taking antibiotics? → Antibiotics cause diarrhea in many people and should be avoided unless necessary. See page 26.
- ? Are a lot of people in the household or community sick with diarrhea at once? → When a lot of people have diarrhea, everyone must be more careful to prevent it spreading. You can do this by washing hands more, washing or peeling vegetables and fruits, making water safe to drink, and building toilets where there are none. See Water and Sanitation. Eat food quickly after preparing it and wash hands and surfaces used to prepare food. If everyone with diarrhea ate the same food, the food was probably bad.
-

Questions to ask if there might be worms

Worms are explained starting on page 31. Some worms are big enough to see in the stool. Some can only be seen with a microscope.

If worms are common in your area, treat children for worms regularly.

- ? Have you seen worms in the stool? Are worms common where you live? → If someone has worms, give the correct worm medication. See page 31.
- ? Is the belly swollen? → This can have many causes including:
 - a big ball of roundworms. See page 32.
 - malnutrition. (A child can be malnourished and have roundworms at the same time.) See page 20 in Good Food Makes Good Health.
 - giardia. See page 31.
 - hepatitis. See page 17.
 - tuberculosis in the gut. See Problems with Breathing and Coughing (in development).
- ? Is there burning, itching, or pain in the anus? → This is usually a hemorrhoid, or raw, torn skin from rough wiping after bowel movements. See pages 39 to 40.
- If a child scratches her anus, especially at night, it may be pinworm. See page 32.



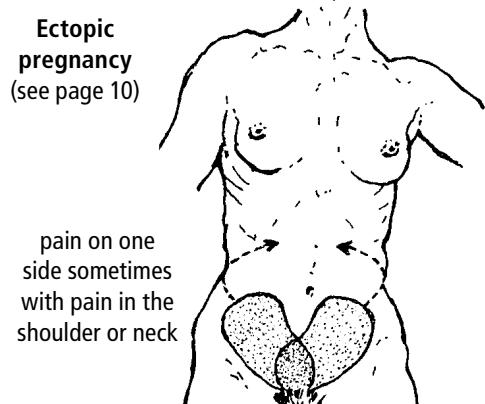
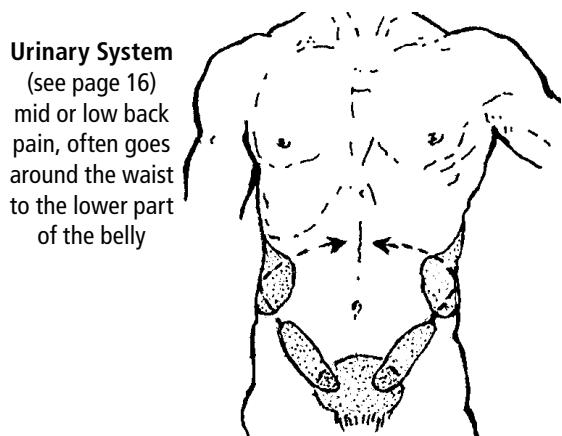
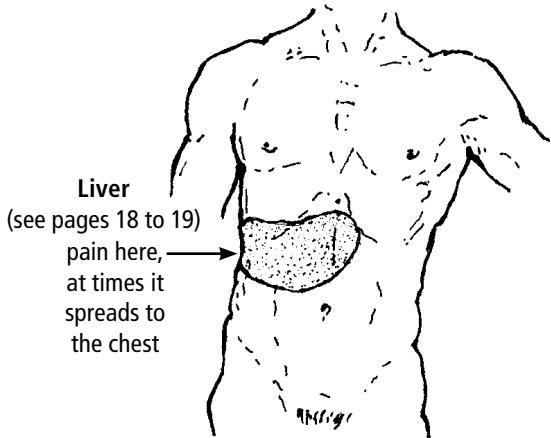
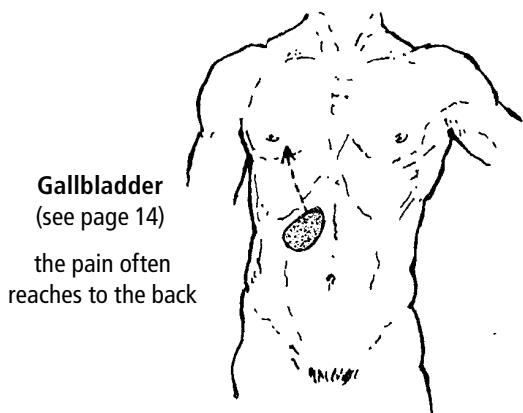
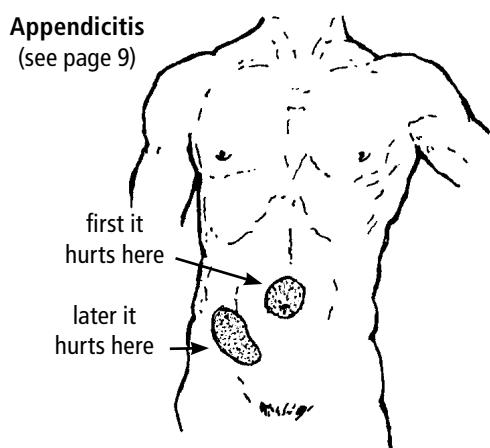
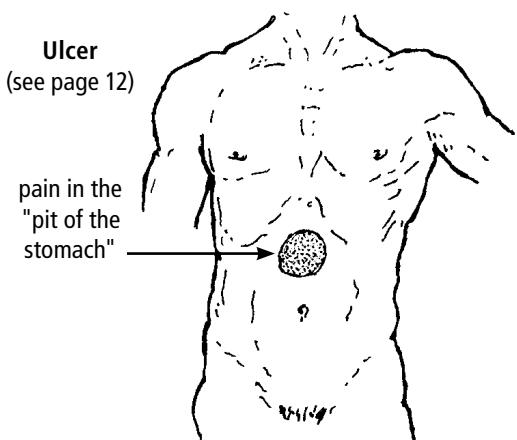
Questions about other problems with the stool (feces)

- ? Is the stool whitish or much lighter in color than normal stool?
→ This is a sign of hepatitis (liver disease). See page 17.
- ? Is there red blood in the stool?
→ This is usually a hemorrhoid or another sore in the rectum. See page 39. It is usually not dangerous, but it could also be a sign of colon cancer (see Cancer - in development).
→ Bloody diarrhea with mucus is called dysentery, see page 30.
- ? Is the stool black and sticky?
→ This is usually from blood higher up in the intestine or in the stomach. **This is dangerous.** See page 38.

Pain in the Belly or Gut

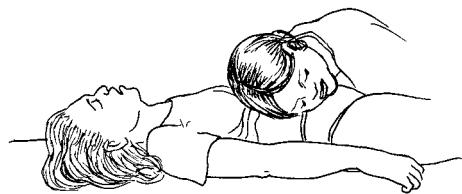
If there is pain, ask the person to point to the exact spot where it hurts. The location of the pain in the gut can be a clue as to what is causing it. It is also important to know if the gut is working – moving and digesting food. If it is not, that can be a sign of real danger.

1. **Ask:** has the person had any bowel movements or farted? Having normal bowel movements is a good sign. If the person has not had a bowel movement in a few days it could be constipation (page 37). If they have no bowel movements, cannot fart, and have pain, it might be obstruction (page 8).
2. **Listen:** are there any sounds from the gut? Sounds are a healthy sign of digestion and you will hear some sounds even when there is constipation. No sounds are another dangerous sign of obstruction.
3. **Feel:** is the belly hard, like a board? Is your touch very painful? These are signs of serious danger.



How to listen

Listen to the belly with a stethoscope or your ear, to help find out if the person is in danger.



A healthy belly makes little gurgling sounds every few seconds. (If you are a health worker, practice listening to healthy people's bellies to get to know these normal belly sounds. It takes practice to hear these quiet sounds.)

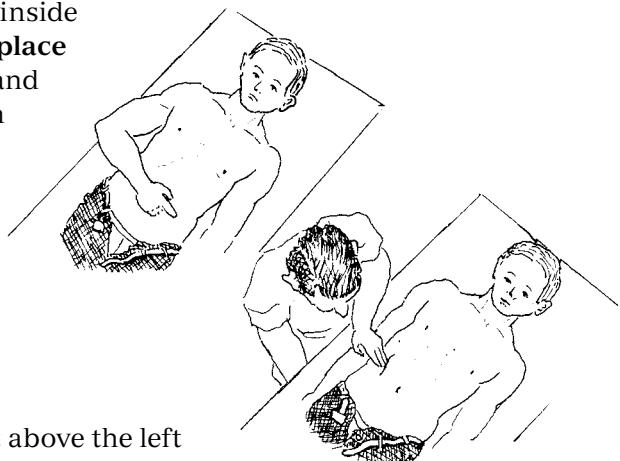
Lots of loud gurgles may mean food is moving very quickly through the bowels. Does the person have diarrhea?

High-pitched noises, or no belly sounds for 2 minutes, are signs of acute abdomen. Feel the abdomen. If it is hard and painful, get to a hospital quickly. See page 8.

How to feel

Ask the person to touch the place where it hurts.

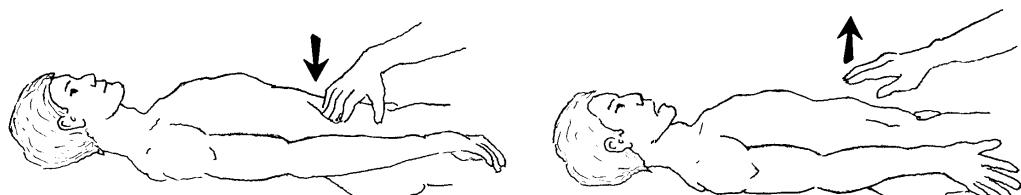
Beginning on the opposite side from the spot where he has pointed, press gently to try to learn which organ inside the body hurts. (**Save the most painful place for last.**) Use gentle, but firm pressure, and move in an organized pattern so you can feel each part of the belly.



Note also whether the belly is soft or hard, and whether the person can relax his stomach. If it is stiff like a board, he may have an obstruction. See page 8.

How to check for rebound pain

Slowly but forcefully press the belly, just above the left groin, until it hurts a little. Then quickly remove your hand. Sharp pain when you remove your hand – worse than the pain from the pressure of your hand – is called rebound pain. If there is no rebound pain on the left, try on the right. Rebound pain is a sign of appendicitis or peritonitis (page 9). Go to a hospital right away.



Severe, sharp pain in the gut (acute abdomen)

Sudden onset of severe pain in the gut, that keeps getting worse, with no diarrhea, is likely acute abdomen. Acute abdomen can be caused by obstruction (see below), appendicitis (page 9), ectopic pregnancy (page 10), or other dangerous problems. If you see these signs, you can save the person's life by helping her get to a hospital right away.

SIGNS

- Continuous, sharp pain – feels like a knife
- Vomiting
- Few or no bowel movements
- A hard, quiet belly
- Severely ill feeling

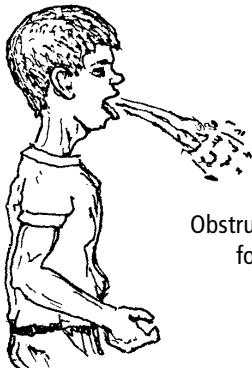
Usually the person with acute abdomen is writhing in pain, unable to get comfortable and protecting her belly with her arms.



Obstruction

When something blocks (obstructs) part of the gut, food and stool cannot pass. This can cause serious pain and infection.

Along with pain, the person may have constipation and vomiting. The belly can be silent, or can make a lot of high-pitched noises.



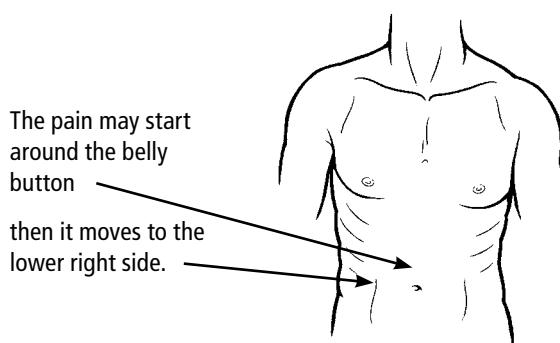
Obstruction can cause very forceful vomiting.

Obstruction may be caused by:

- a ball of roundworms (page 32).
- a hernia (see page 27 in Caring for Children).
- a loop of intestine twisting around an old scar. This can happen to someone who had an injury or surgery to the gut.
- cancer (see Cancer - in development).

If you think there may be obstruction, do two things:

- 1. Get the person to a hospital right away.** Surgery may be needed.
- 2. If there are roundworms where you live, treat the person for roundworms on the way to the hospital, in case worms are causing the obstruction. See page 54 for worm medicines.**



Appendicitis and peritonitis

Appendicitis is an infection of the appendix, a little sac attached to the large intestine in the lower right side of the belly. There is no way to prevent appendicitis. It just happens to some people.

The main sign of appendicitis is a sharp pain in the belly that gets worse and worse.

Someone with appendicitis usually does not want to eat. There usually will not be diarrhea. Fever is common, and walking or riding over bumps in the road hurts a lot. There is rebound pain (page 7).

Get medical help. If not treated, the infected appendix may burst, spreading germs inside the belly. This can cause a deadly infection called **peritonitis**.

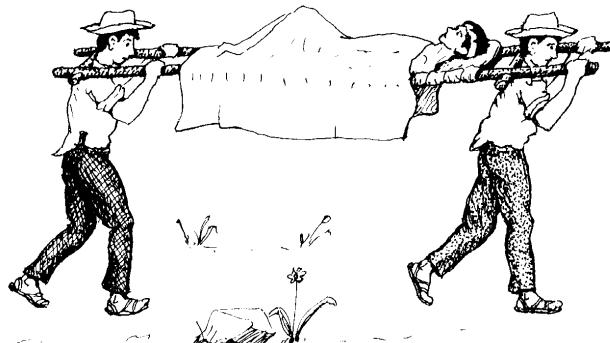
Peritonitis can also be caused by an injury to the gut – for example, being hit very hard or stabbed in the belly.

If the belly is quiet, hard, and painful all over, there is peritonitis.

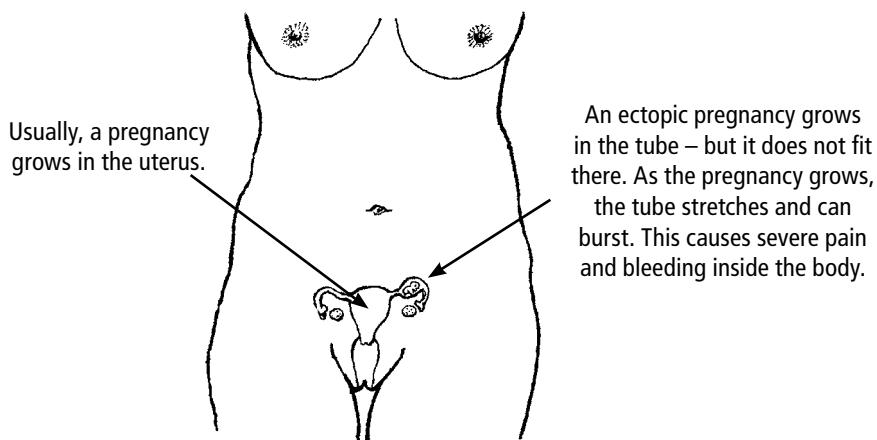
If you think the person has appendicitis or peritonitis:

- get him to a hospital.
- give 2 medicines: metronidazole AND ciprofloxacin OR ceftriaxone OR ampicillin. See page 50.
- do not give any food or drink except medicines and small sips of water.

Watch for signs of shock such as weak, rapid pulse; pale, cold skin; or confusion or loss of consciousness. See pages 10 to 11 of First Aid.



Ectopic pregnancy



As with a miscarriage, signs of an ectopic pregnancy happen early in pregnancy – often before the woman even knows she is pregnant. There is pain in the lower belly and some bleeding after having no menstruation for one or more months.

SIGNS

- Bleeding from the vagina is usually light – called spotting (bleeding from miscarriage is heavier).
- Pain may become stronger on one side.
- If the pregnancy breaks through the tube, the pain becomes severe.
- The woman may also have pain in her shoulder or neck.
- The woman may feel dizzy or light-headed because she is bleeding inside.

Severe pain in the lower belly can have many causes, including bladder infection, appendicitis, and others. If possible, ask the woman to take a pregnancy test. If the test is positive, or if you cannot test but think there may be an ectopic pregnancy, **get her to a hospital – you can save her life.** If the pregnancy test is negative, it is not an ectopic pregnancy.

On the way to the hospital, treat for signs of shock such as weak, rapid pulse; pale, cold skin; or confusion or loss of consciousness. See pages 10 to 11 of First Aid.



Stomach cramps

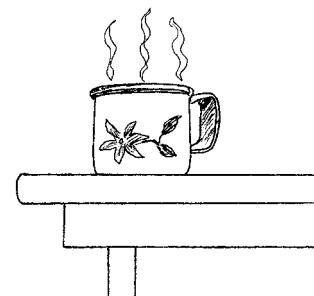
Most cramps are not very dangerous. They can be caused by:

- eating food that has been left out too long or spoiled.
- drinking water that has germs in it.
- worms.
- ulcers.
- stress or nervousness.
- hunger.
- menstruation.

Usually, stomach cramps will get better on their own in a day or two. To help:

- drink tea of boiled ginger, mint, chamomile, or another tea that calms the stomach.
- eat papaya. It helps break down food in your gut.
- take a hot bath, or use a warm compress on the belly, or simply rest in a dark, quiet place. See Care for Sick People (in development) to learn how to make a warm compress.
- avoid foods that can cause gas. Milk, cheese, cabbage, peppers, onions, or beans might be the problem.

You can prevent a lot of stomach cramps by cooking food thoroughly to kill germs, eating food while it is still hot, and washing your hands before cooking and eating. For more on preparing and storing food, see the information starting on page 5 of Water and Sanitation: Keys to Staying Healthy.



Gently massage the belly, or rub it in a slow, clockwise circle.

Problems digesting cow's milk

Many people are unable to digest milk from cows, a problem called lactose intolerance. For these people, drinking cow's milk and eating cheese or other milk products causes stomach cramps, diarrhea, and painful gas. This is due to the lack of an enzyme (a chemical) inside the body which helps digest milk. The majority of Asian, Native American, and African people, along with many people from other parts of the world, are lactose intolerant. The solution is to avoid most milk products. Yogurt and other fermented milks are often easier on the stomach than liquid milk and may even help prevent stomach aches and diarrhea.

Heartburn, acid reflux

Heartburn, acid indigestion, and reflux are all names for a burning feeling or pain in the middle of the chest or throat caused by stomach acid getting up into the food pipe. It can be very painful. It tends to happen when you lie down or after you eat – especially after eating a lot, or eating something fatty or spicy.

The name “heartburn” is confusing: it has nothing to do with the heart. (Real heart pain often feels “heavy” or “tight.” It may spread to the jaw, shoulder, or belly. See Heart Problems - in development.)

TREATMENT AND PREVENTION

- Do not eat for at least 3 hours before you go to sleep.
- Eat smaller meals, but eat more often.
- Avoid fatty and spicy foods.
- Avoid alcohol and smoking, which make heartburn worse.
- Try an antacid to ease the pain (pages 51 to 53).



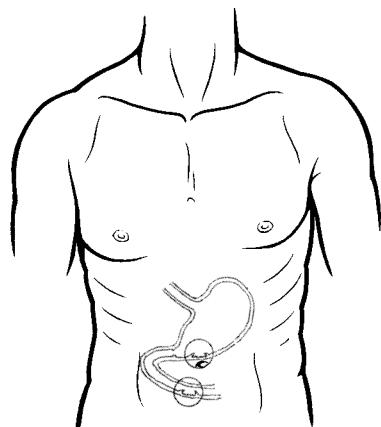
Heartburn causes burning or pain in the chest, and sometimes in the throat.



Sit upright after eating, and prop yourself up to sleep at night (or raise the head of your bed with a few blocks). This keeps the acid down in the stomach.

Ulcer

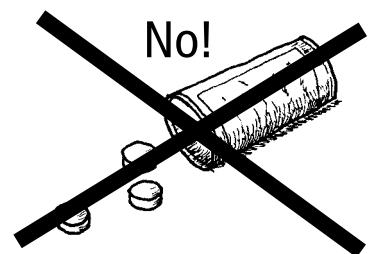
Stomach pain that comes again and again may be caused by an ulcer. Ulcer pain is usually burning or gnawing, like hunger, and is felt in the upper middle part of the belly. Often, an ulcer will cause pain for a few weeks, and then will go away for weeks or months before coming back again. The pain may lessen when the person eats or drinks. (Or eating may make the pain worse, depending on where the ulcer is.)



An ulcer is an open sore inside the stomach or intestine.

TREATMENT: TO LESSEN THE PAIN AND HELP THE ULCER HEAL

- Stop taking ibuprofen, aspirin, and other pain medicines (pages 39 to 40 in Caring for Children: Medicines). Taking these frequently hurts the stomach and is one of the main causes of ulcers. (Paracetamol is better for people with stomach pain because it does not harm the stomach, but it should also not be taken in large quantities or every day.)
- Do not smoke. People who smoke have more ulcers, and their ulcers take longer to heal.
- Eating smaller meals and drinking a lot of water throughout the day can help lessen the pain.
- You may find certain foods make the pain worse. Try avoiding acidic foods like lemon, vinegar, and coffee. Chili, fatty foods, and alcohol also worsen the pain for some people.
- Stress might be one reason people get ulcers, and stress tends to make them hurt more. Finding ways to be less anxious and upset may help. For ideas about relaxation, see Mental Health (in development).



If after a few weeks of making the changes above there is still a lot of pain, try a low-cost antacid. Pain may be reduced by calcium carbonate, 4 times a day for 1 week. A class of medicines called proton pump inhibitors (PPI), such as omeprazole (see page 53), work even better. They reduce acid in the stomach enough to relieve pain and often allow the ulcer to heal. However, if the pain comes back, you will need to cure the ulcer with antibiotics.

TREATMENT: TO CURE THE ULCER

For ulcers that keep coming back, you will need to give a combination of antibiotics, proton pump inhibitors, and antacids for 2 weeks. This is a lot of medicine, but if taken correctly the ulcers will usually stop coming back. See page 53.

If there is still stomach pain after this treatment, the problem is likely something else – not an ulcer. Get help.

DANGER SIGNS

Are there signs of **bleeding ulcers**? Watch for bloody or black, grainy vomit – like coffee grounds. Feces may be bloody or black – like tar or motor oil. This is an emergency. Get help.



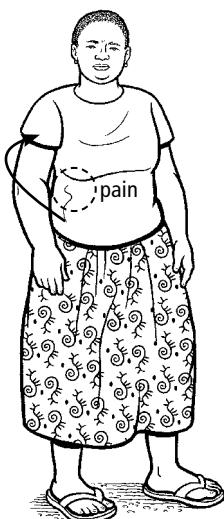
Some people take sodium bicarbonate (baking soda) for belly aches. This works quickly, but causes the stomach to make more acid later, so do not use it often. Do not use sodium bicarbonate if you have heart problems or swollen legs, it can make these problems worse.

Gallbladder problems

The gallbladder is a small sac that collects bile, which helps digest fatty foods. The bile can harden, causing an obstruction in the gallbladder. This can cause pain that lasts several hours. Gallbladder problems are more common in women 40 years or older, people who are fat, and people with diabetes. But any adult can get this problem.

SIGNS

- Steady pain in the center or right edge of the rib cage. This pain may spread up to the right side upper back or the shoulder.



- Pain that gets worse and worse, then stays the same for a while, then after a few hours it slowly goes away.
- Pain that comes soon after eating fatty foods. It may wake the person in the night.
- Nausea and vomiting.
- Taking aspirin or paracetamol, changing positions, or farting does not make it feel better.

While these signs can help to identify a gallbladder problem, an ultrasound or x-ray is needed to know for sure.

TREATMENT

Gallbladder pain can be very uncomfortable, but if there is no fever or other danger signs listed below, it is not immediately dangerous. Ibuprofen may help relieve pain.

DANGER SIGNS

If a person has gallbladder problems, watch for these danger signs. The person will need surgery.

- Gallbladder pain that lasts more than 4 hours at one time.
- Gallbladder pain with fever.
- Gallbladder pain with jaundice (yellow skin or eyes).

PREVENTION

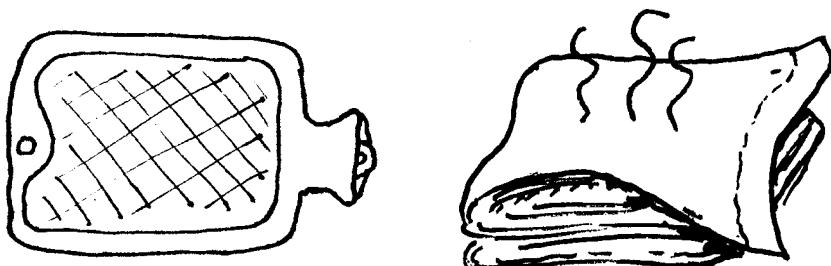
Avoid fatty meat, deep fried food, or other very fatty foods which often trigger gallbladder pain in someone who has this problem. (It is OK to eat a small amount of fat or oil in each meal and doing so helps the gallbladder empty itself. Vegetable oils are better than palm oil, butter, or lard.)

If you are fat, losing weight may help, but do so slowly by exercising often and eating smaller amounts. Losing a lot of weight very fast can cause gallstones.



Menstrual cramps

Many women have cramps or pain in their lower bellies right before or during their monthly bleeding (menstruation). Rest, use gentle massage, or take a pain reliever such as ibuprofen. For more on menstruation and how to reduce pain, see Women's Menstrual Cycles (in development).



A hot water bottle or warm compress on the belly can help with the pain.

Pelvic infection

When a woman has pain in her lower belly, she might have an infection of the uterus called pelvic infection. There are 2 causes of pelvic infection, both dangerous. It can happen when harmful germs get inside a woman's body, either after childbirth or after the loss of a pregnancy (miscarriage or abortion), or when a sexually transmitted infection is left untreated and spreads into the uterus.

SIGNS

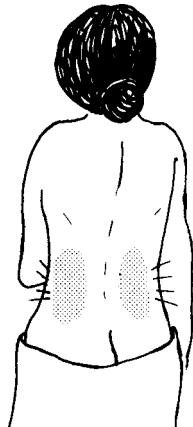
- Pain in the lower belly (pelvis) – it can be mild or severe.
- Pain or bleeding during sex.
- Tenderness when you press on the lower belly.
- Fever.
- Unusual bleeding or bad-smelling discharge from the vagina.

TREATMENT

Treat the infection with antibiotics right away to prevent serious illness, infertility or even death. If this infection came after a pregnancy or birth, see page 32 in Pregnancy and Birth. If the woman was not recently pregnant, she needs different medicines, listed in Genital Problems and Infections: Medicines (in development).

Bladder infection, kidney infection

A bladder infection (urinary tract infection, cystitis) causes pain or burning when urinating, or pain just behind or above the front of the pelvic bone. But if the infection spreads into the kidneys, the pain may be felt along the side or in the back. Bladder infections are especially common in women. For more about bladder and kidney infections, see Difficulties with Urinating (in development).



Pain when you tap on one side of the lower back could mean an infection or stone in the kidney.

Kidney stones

Kidney stones are tiny rocks that form inside the kidney, urine tube, or bladder and cause a lot of pain as they pass out with the urine. Usually the pain slowly gets worse and worse, and then stops. The pain lasts 20 minutes to an hour each time. It is often more on one side and might be felt anywhere from the back to the urethra (the tube urine travels through). In men, the pain can also be felt in the testicles. There may be blood in the urine. There is usually no fever and the belly is soft. The regular treatment is to take a pain medicine and drink a lot of water until the stone passes, but see Difficulties with Urinating (in development) for more information on how to prevent and treat this.

Hepatitis

Hepatitis is the name for inflammation of the liver. Hepatitis can be caused by a virus, drinking too much alcohol, or chemical poisoning. All types of hepatitis have similar signs. But a person gets the different kinds of hepatitis in different ways, and some are more dangerous or longer lasting than others. Hepatitis A and E usually go away within a few months. Hepatitis B and C can last for many years and can lead to liver cancer.

SIGNS

- Nausea and vomiting.
- Itching skin.
- Dark urine – the color of Coca-Cola.
- Light, whitish stools.
- Pain on the right side. Or sore muscles and joints all over.
- Weakness and exhaustion that can last for months.
- Yellow eyes and skin.

You may be able to feel the swollen liver from the outside, on the right side, just under the ribs.



The liver cleans the blood. When the liver is not working well, toxins and wastes build up in the body, causing sickness.

TO HELP THE LIVER HEAL

There are now medicines that can help treat Hepatitis B and C, however they are not yet widely available. Check at your health center to see if you can get them where you live. Even without medicines, rest, plenty of fluids, and avoiding certain things that harm the liver can help it heal.



Hepatitis makes you very tired.
 Listen to your body and rest.

- Drink throughout the day – 8 cups or more. Water, fruit juices, and soup broth are all healthy choices.
- Do not drink any alcohol for at least 6 months. Alcohol is very hard on the liver. If you need help to stop drinking alcohol, see Drugs, Alcohol, and Tobacco (in development).
- Avoid paracetamol because it can build up in the liver and cause problems. Take a different pain medicine if you need one.
- If you have tuberculosis, you may need to wait to start treatment until the liver heals. Get medical advice. (If you develop signs of hepatitis while taking tuberculosis medicines, stop treatment immediately and get medical help.)
- Be cautious about using medicines. Avoid medicines that are not essential. Many medicines harm the liver, especially when taken in large amounts or over a long period.



PREVENTION

Hepatitis A and E are spread because of poor sanitation and can be prevented by using toilets and washing hands.

Wash your hands many times each day to protect others from infection. Everyone who lives in your house should wash their hands more often too.

Hepatitis B and C are found in blood and sexual fluids. These forms of hepatitis spread during sex or when tools for scarring, tattooing, cutting, or injecting are used on more than one person without cleaning them each time. This allows blood, and the virus inside the blood, to pass from one person to the next. Hepatitis B and C can also pass from a mother to her baby during pregnancy, birth, or after birth.

In places where hepatitis B is very common, including many parts of Africa and Asia, it passes among children and within families even without sharing blood. This is more likely to happen when the family lives in a small, crowded home and are in very close contact most of the time.

Prevent hepatitis B and C:

- Avoid injections unless necessary. Always use a brand new needle and syringe for each injection. If you cannot get new ones, you must sterilize needles and syringes between each use. See Medicines, Tests, and Treatments (in development).
- Use condoms when you have sex.



Hepatitis A and B can be prevented with vaccines. Hepatitis B vaccine is especially important for those who live where the Hepatitis B virus or liver cancer are common.

*If you are caring for a person sick with hepatitis,
keep yourself healthy by washing your hands often and
protecting yourself from his blood and stool.*

Liver abscess

Liver abscess can be caused by an infection of amebas that has spread to the liver. This is much more common in men.

SIGNS

Tenderness or pain in the right upper belly with a fever. The pain may also go into the right chest. It is worse when the person walks. Compare this with hepatitis, cirrhosis (see Drugs, Alcohol, and Tobacco - in development) and gallbladder pain, page 14.

If someone with signs of liver abscess begins to cough up a brown liquid, the abscess is draining into his lung. This requires medical help.

TREATMENT

Treat as for amebic dysentery. See pages 47 and 49.

Dehydration

Dehydration means not enough fluid in the body. It is described in this chapter because the most common cause is diarrhea. Dehydration can also come from vomiting, getting too hot from the sun, overwork, or wearing too many layers of clothing. Especially in young children, dehydration can get worse quickly and become deadly.



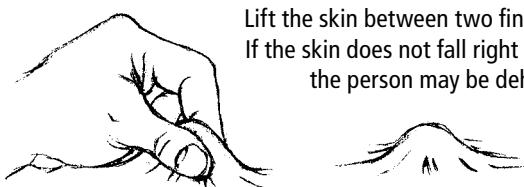
No matter the cause, the treatment, which anyone can do at home, is rehydration (drinking fluids). You can save a person's life by helping her drink fluids when she is dehydrated.

SIGNS

- Thirst
 - Dry mouth and tongue (when you touch the inside of the person's cheek, it feels dry)
 - Urinating less often and the urine is dark-colored
- Start treatment now, before the signs get any worse.

SIGNS THAT DEHYDRATION IS GETTING WORSE

- Lethargy: tired, low-energy
- Fast heart beat
- Deep breathing
- Sunken, tearless eyes
- Skin stays in a pinched shape



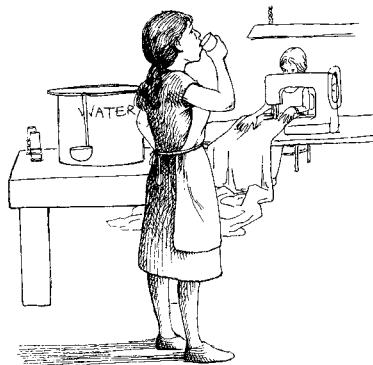
Lift the skin between two fingers, like this...
 If the skin does not fall right back to normal,
 the person may be dehydrated.

- In infants, a sunken "soft spot" on the head

TREATMENT AND PREVENTION

It is always safer and easier to prevent dehydration than to try to treat it once it starts. **Give fluids before signs of dehydration appear.**

*Dehydration is prevented and treated in
the same way – by drinking fluids.*



Do you believe that giving something to drink will make diarrhea worse? It is easy to think this as you watch liquid diarrhea come from a child. **But fluids do not cause diarrhea.**

Diarrhea happens because of infection with germs. It will continue whether the person drinks or not. But giving fluids helps a person to stay strong enough to recover from the infection. Someone with diarrhea who does not drink will dehydrate and may eventually die. **You can save a life by giving fluids to replace what was lost.**

Holding back fluids does not protect children from diarrhea. It puts them in danger.

Drinking fluids keeps you healthy when you have diarrhea, and helps you get well.



Rehydration drinks

Rehydration means replacing what we lose during dehydration. When we have diarrhea, when we vomit, and when we sweat, we lose water. So rehydration drinks must include water. We also lose nutrients that we get from food, mainly salt and energy (that we get from eating sugar or grain or protein). To rehydrate, we must replace these nutrients too. Water + a little salt + energy food (sugar or rice or corn meal) = rehydration drink.

Give as much rehydration drink as the person will drink, one or more drinks after each stool. Each drink should be at least one cup for a small child, a cup or more for an older child or adult.

Keep giving rehydration drink until diarrhea has stopped and signs of dehydration are gone.

What are some good rehydration drinks? Almost any fluid that you can easily prepare at home is a good rehydration drink!

Salt and sugar drink

At home or at a clinic you can make a simple rehydration drink. It is just as good as the ORS (oral rehydration salts) packets you can buy, but costs much less.

1) In 1 liter clean water

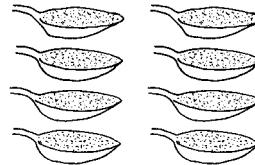


2) Mix ½ teaspoon salt

Taste this mixture. It should be less salty than tears.

3) Then mix in 8 flat teaspoons sugar

OR, instead of sugar, mix in 8 rounded teaspoons of cereal, such as ground rice cereal or maize meal. If you use cereal, cook the mixture for a few minutes before serving it.



To mix a single serving of rehydration drink:



1 glass water + 1 pinch of salt + 2 or 3 teaspoons of sugar or cooked grain cereal

Rice water

Rice water works as well as salt and sugar solution for rehydration. Cook some rice in twice as much water as you would normally use. Add some salt to the water. (About $\frac{1}{2}$ teaspoon salt per liter of water, or a big pinch in a glass of it). You can add a little sugar if you like. Drink as much as you can. You can eat the rice too.

Other home cereals

If you usually make porridge or gruel to eat or feed to young children, these can be watered-down for rehydration drink. Ground corn, dal, potato, or cassava will all help rehydrate someone (if they are well cooked and watered down to a thin liquid, and a little salt is added).

A thinned porridge like this does not replace food. If you thin down porridge for a rehydration drink, you can also give regular, thick porridge to eat. To recover from dehydration, give food as well as fluids.

Yogurt or fermented milk drinks

These are good rehydration drinks and provide needed protein too. If the yogurt drink is very thick, mix in some water. Add a pinch of salt per glass.

Breast milk

If you are breastfeeding a child who has diarrhea, continue to do so. Breastfeed the child more often – at least after every bowel movement. Let him breastfeed for as long as he wants. A child who has any signs of dehydration should also get some salt and sugar drink after each time he breastfeeds.



Avoid drinks that make dehydration worse

Very sugary drinks, drinks with caffeine, and alcohol worsen dehydration. So avoid:

- Sodas (*Coke, Fanta, Pepsi*) and sugary fruit drinks.
- Coffee and strong tea.
- Beer, wine and other alcohol.



What about plain water?

When you are dehydrated, plain water is not as good as the rehydration drinks above because it lacks the nutrients your body needs. When you are very dehydrated, drinking plain water can make you sick because you also need salt and energy. But it is better to give plain water than nothing at all – for a little while. Give water while you wait for rice water or cereal drink to cook.

Must the water be boiled first?

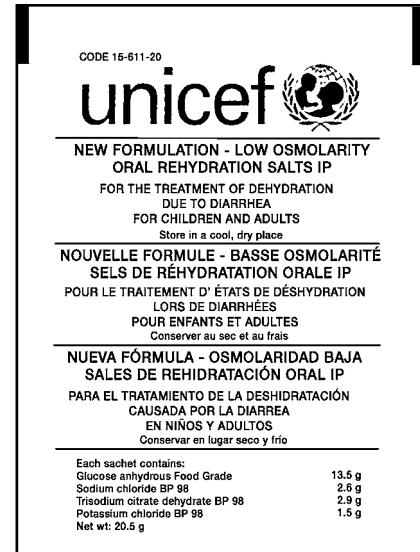
Water that has been boiled or otherwise cleaned of germs (disinfected) is best. To make water safer to drink, see Water and Sanitation.

But if you do not have firewood for boiling water, or have trouble getting clean water, use the water you do have until you can make your water safe.

Pre-packaged ORS

Pre-made packets of Oral Rehydration Salts (ORS, ORT) may be available from your pharmacy, clinic, or market. Like homemade rehydration drink, these contain a mix of salt and sugar in the right amounts for treating dehydration. They also contain potassium, citrate, and zinc – which are helpful nutrients for people with diarrhea. Where these packets are available for free, they are a convenient way to make rehydration drink. Be sure to add the right amount of water – usually 1 liter of water per packet. (But check the instructions on the packet because adding too little or too much water can make sickness worse.)

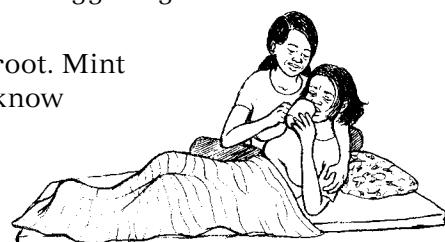
If ORS packets are not free, it is better to make your own rehydration drink – it is much less expensive. Spend your money on vegetables, beans, eggs, or other healthy foods. Your homemade rehydration drink is just as good as the packet, and healthy food will help you recover faster.



Vomiting

Vomiting once or twice is usually not dangerous and goes away on its own. For simple vomiting with a cold or stomach problems:

- Give small but frequent sips of rehydration drink (page 22). Some people like bubbly drinks such as soda for nausea. If you are throwing everything up, drink one small spoonful. Wait 15 minutes and drink another. If those stay down, have another spoonful in 5 minutes. The idea is to drink more as soon as you can without triggering more vomiting.
- To lessen nausea, make tea by boiling ginger root. Mint or chamomile tea might help too, or you may know another local plant medicine that works.
- When you start to feel better, eat a little at a time, and keep drinking fluids to replace what you have lost.



DANGER SIGNS

- Vomiting that causes dehydration (see page 20).
- Vomiting for more than 24 hours, or vomiting that keeps getting worse.
- Violent vomiting with a dark green or brown color, or with the smell of feces (see obstruction, page 8).
- Vomiting blood or vomit like ground coffee (see ulcer, page 12 and cirrhosis, in Drugs, Alcohol, and Tobacco - in development).
- Vomiting with fever and pain that lasts more than 24 hours (see acute abdomen, page 8).

Diarrhea

Passing loose, watery stools several times a day is called diarrhea.

When a person has diarrhea, he loses fluids and nutrients very quickly. A healthy adult may have diarrhea for a day or two, and will quickly recover. But losing so much fluid and nutrition is dangerous for children, old people, and people already weak from malnutrition or another sickness.



Care for children with diarrhea is explained in Chapter 28: Caring for Children. If you are helping a baby or a child with diarrhea, or you live somewhere where children die of diarrhea, please read the section below, and then read the section starting on page 7 of Caring for Children.

DANGER SIGNS

- A lot of watery diarrhea in a short time. This could be cholera (page 28). No matter the cause, a lot of diarrhea in a short time quickly leads to dehydration.
- Diarrhea with blood and mucus – called dysentery (page 30).
- Diarrhea that goes on for weeks. This kind of long-lasting diarrhea drains the body of nutrients and weakens the gut. It is usually caused by malnutrition or a long-lasting illness (see page 20 in Good Food Makes Good Health).

TREATMENT

1. **Treat dehydration.** Dehydration is the real danger of diarrhea, and the reason people with diarrhea can die. So the most important step in caring for people who have diarrhea is drinking fluids. You can make rehydration drink at home to replace the nutrients you need. See page 22. **Drinking fluids does not worsen diarrhea. On the contrary, drinking fluids can save your life.**
2. **Give food.** At first, if the person feels nauseous, you may need to give only little bites of something mild. Yogurt and bananas are especially helpful and may help diarrhea end sooner. Give more food as the person can eat more. Children especially must eat.
3. **Decide if medicines will help** (usually, they do not). To help you decide, see page 28.



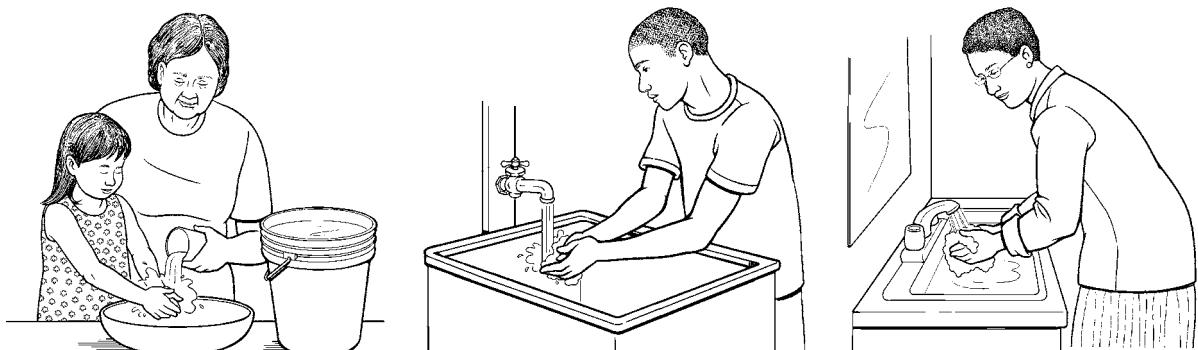
What causes diarrhea?

Diarrhea has many causes. The most common are:

- **A germ (virus, bacteria, or parasite) spread by poor sanitation.** Prevent diarrhea by using toilets, washing hands, and cooking food well and eating it soon after cooking (instead of letting it sit for hours). When you buy food made on the street, ask for it to be heated again. See Water and Sanitation: Keys to Staying Healthy for more advice on improving sanitation – the best way to prevent diarrhea.
- **Another infection in the body.** Ear infection, bladder infection, malaria, or HIV can all cause diarrhea. The diarrhea will get better once you treat the main infection.
- **Malnutrition.** Malnutrition weakens the gut, making it less able to absorb food and liquid, which pass quickly through the intestine and cause diarrhea. Better food, every day, is needed to treat malnutrition. For ideas on how to eat well with little money, see page 12 in Good Food Makes Good Health.
- **Antibiotics.** Antibiotics can cause diarrhea and stomach aches. They are used much more than they are needed and many sicknesses will get better without antibiotics. They do nothing for the common cold or other diseases caused by viruses, for example. In general, avoid antibiotics for common infections and only use them when you are fairly certain the disease you are treating requires these medicines.

All I do is treat kids with diarrhea. Maybe it would be a better use of my time to work on getting a clean water system for the community.





You can prevent many cases of diarrhea by washing your hands often with soap and water.

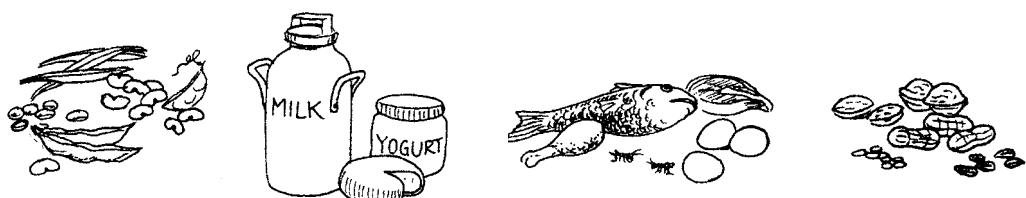
Eating and diarrhea

A person with diarrhea should start eating again as soon as possible. For someone who is vomiting, or feels too sick to eat much, offer small amounts of food many times a day. If there is a lot of diarrhea, offer a little every hour or two to replace all the lost nutrition. Try soups or gruels of rice, maize, or potatoes. Include a little well-cooked meat, eggs, or vegetables if the person can keep that down. Fermented milk drinks or yogurts provide protein. Fried foods and raw fruit are not as good for a person with diarrhea.

For diarrhea that lasts 2 weeks or more – chronic diarrhea – eating is especially important. Chronic diarrhea is usually caused by malnutrition or a long-lasting illness, such as HIV. In either case, more food is needed to replace what was lost from diarrhea and to help the gut better absorb the food that is eaten.

*Malnutrition worsens diarrhea.
Diarrhea worsens malnutrition.
Food breaks the cycle.*

A malnourished child must eat more often – 6 times a day or more. Every day, she needs protein and fat, to replace lost strength and energy. Vegetables and fruits protect the body and help her fight infections – including the infections that lead to diarrhea. See page 20 in Good Food Makes Good Health for how to treat malnutrition.



Children with chronic diarrhea need protein foods.

Medicines

For most diarrhea, using medicines will not fight the infection that caused it. They are just a waste of money and may even be dangerous.

For certain causes of diarrhea, antibiotics can be of use. Antibiotics are helpful for dysentery and certain cases of cholera. But even for dysentery and cholera, drinking fluids is the most important treatment. Never give a laxative to someone with diarrhea.

“Anti-diarrhea medicines” such as bismuth or loperamide slow or stop up the bowel but do not prevent dehydration, which is the real danger of diarrhea. Even though the fluid is not leaving the body, it is leaving all the organs that need it to function. While these medicines may occasionally be useful, for example, if you will be on a bus for a long time, they slow the body’s ability to get rid of bacteria and make diarrhea last longer. Avoid these drugs when the person has fever, bloody diarrhea (dysentery), or constant liquid diarrhea (cholera). Loperamide is not safe for children.



Anti-diarrhea medicines act like a plug. They keep the infection inside, instead of letting it come out.



Cholera

Large amounts of diarrhea that looks like rice water may be cholera. Cholera spreads very rapidly to affect many people in a community at once. Cholera quickly leads to severe dehydration that can cause death. You can save the life of a person with cholera by giving fluids.

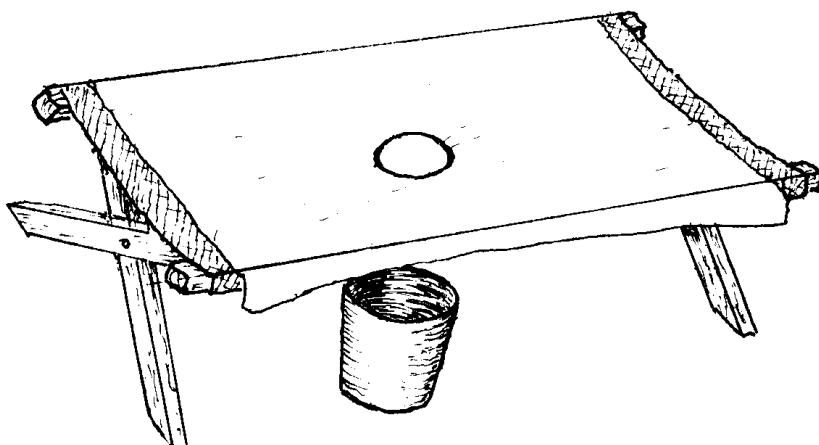
TREATMENT

Treat the dehydration continuously with rehydration drink. Have the person drink as much as he can, not stopping until the diarrhea has stopped and there are no more signs of dehydration. Even though the person is likely to vomit, he must continue to drink.

Antibiotics may help for certain cases of cholera. Which antibiotic to use depends on drug resistance in your area. Check with your local health authority and see page 42.

Cholera is everyone's problem

An outbreak of cholera is an emergency for the entire community. The bacteria that cause this disease are spread through the water supply and quick action must be taken to stop it.



A "cholera bed" can allow people to rest and stay fairly clean.

- Be sure everyone knows the most important treatment for cholera: **drinking as much fluid as possible**. Share the recipe for rehydration drink on the radio, by telling your neighbors, and by posting notices.
- Wash your hands often and help everyone understand the need for good hygiene to stop the spread of the infection.
- Get people who need it to medical help. There may be a "field clinic" or somewhere to take people for IV fluids. Sometimes antibiotics help and these may be available at a clinic.
- Organize to make the water safe. See Water and Sanitation: Keys to Staying Healthy.
- Future outbreaks can be prevented by building toilets and improving sanitation for everyone. As long as people do not have safe toilets to defecate in, or sources of drinking water get contaminated with human waste, everyone will be in danger of cholera and other illness. See Water and Sanitation: Keys to Staying Healthy for how to build safe toilets.
- There are vaccines that can help prevent cholera. They work best when a whole community is given the vaccine to prevent the spread of an outbreak.

Diarrhea with blood (dysentery)

Dysentery is usually caused by a bacteria called shigella, or by parasites in the intestine called amebas.

SIGNS

- Many loose stools with a lot of mucus and usually blood.
- Cramps in the belly and the feeling of needing to pass stool, even when nothing, or only mucus, comes out.
- Pain in the anus.
- Diarrhea alternating with constipation.

How to know the cause of dysentery

If someone has bloody diarrhea, it is best to test the stool to learn the cause. If you cannot get a lab test, these signs can help determine the cause.

Shigella, called **bacterial dysentery**, usually causes fever. It often starts suddenly, and causes painful cramps and watery stools with mucus or blood.

Diarrhea + mucus or blood + fever = shigella (bacterial dysentery)

Amebas, called **amebic dysentery**, can cause heavy bleeding. Fever is not common.

Diarrhea + blood + no fever = amebas (amebic dysentery)

TREATMENT

It is best to treat dysentery with antibiotics, especially young children or people who are already weak or sick.

For shigella

Shigella quickly becomes resistant to medications, so there is no one medicine that is best everywhere in the world. See Medicines, Tests, and Treatment (in development) to learn more about drug resistance. In most cases, ciprofloxacin will work, but check with your local health authority to learn the best treatment. See page 48 for doses.

For amebas

For amebas, give metronidazole. See page 47.

Giardia

Giardia is a tiny parasite that lives in the gut and is a common cause of diarrhea, especially in children.

SIGNS

- A lot of gas. This causes a swollen, uncomfortable belly, cramps, nausea, and a lot of farts and burps. The burps have a bad taste, like sulfur or rotten eggs.
- Bad-smelling, yellow, and frothy (full of bubbles) diarrhea, without blood or mucus.
- There is usually no fever.
- It can last for weeks, causing weight loss and weakness.

A mild giardia infection is uncomfortable, but will usually get better on its own within about 6 weeks. Good nutrition helps. A long-lasting case, especially in a child, is best treated with metronidazole (see page 47). Quinacrine (see page 50) is cheaper and often works well, but causes worse side effects.

Worms

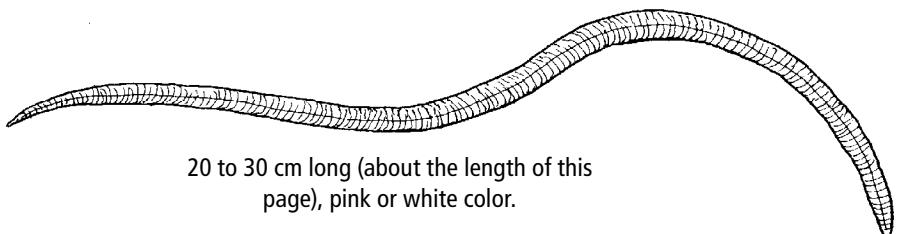
Worms inside our intestines live off our food and blood. They cause belly aches or diarrhea, and drain us of nutrition and energy. A child with a very bad worm infection may develop anemia (lack of iron) or vitamin A deficiency. Often she will have trouble in school and working around the home, because the infection hurts her ability to concentrate.

Different worms get in our bodies in different ways, live different amounts of time, cause different problems, and may require different medicines. Try to learn how the worms where you live are best prevented and treated. (And if you adapt this book for use in another language or specific place, include details about the particular worms common to your community.) But generally, worm infections can be prevented:

- Use toilets to improve sanitation.
- Wash hands. Keep fingernails short so dirt does not get trapped under them.
- Cook meat well before eating. Do not feed raw meat or feces to livestock.
- Wear shoes or sandals.
- De-worm children over 1 year old every 3 to 6 months with albendazole or mebendazole. See pages 54 to 55.

Worms that spread from feces to the mouth: roundworm, whipworm, pinworm

**Roundworm
(Ascaris)**



20 to 30 cm long (about the length of this page), pink or white color.

**Whipworm
(Trichuris, Trichocephalus)**



3 to 5 cm long, pink or grey.

**Pinworm, threadworm, seatworm
(Enterobius)**



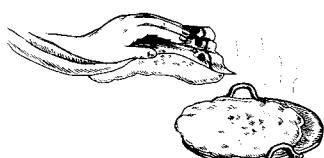
1 cm long, white, very thin and thread-like.

How these worms spread

Tiny amounts of feces are left on the hands when cleaning the anus after passing stool, or when someone scratches an itchy bottom. Or stool left on the ground is tracked into the house by animals, children, or on people's feet. Then worms, or their eggs that are in the stool, get under the nails or on the skin. These worms or eggs get into the mouth when:



A child puts his hands in his mouth.



Someone cooks for the family.



Anyone touches her own or someone else's mouth.

*Worm eggs are too small to see -
that is why they spread so easily.*

TREATMENT

To treat roundworm, whipworm, hookworm, or pinworm, give mebendazole for 3 days. In places where these worms are common, repeat treatment every 3 to 6 months. See page 54.

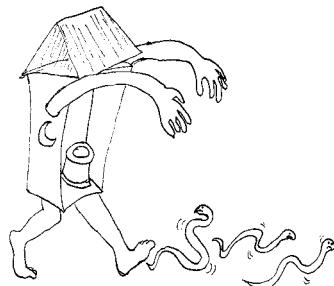
Avoid thiabendazole for roundworms. It can make roundworms move up to the nose or mouth and can cause choking and difficulty breathing.

You may be able to treat these worms with home remedies. Eating a little raw garlic or ground papaya seeds each day can help to kill worms.

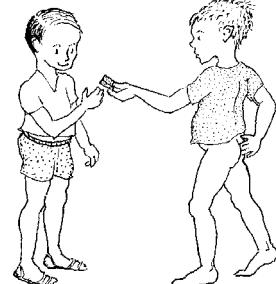
PREVENTION

For worms, prevention is the best and most important treatment. Without prevention and cleanliness, a person will just get worms again and again.

Toilets: Build a clean, private place to pass stool, away from the house and drinking water. Then children and animals will not track stool into the house. See how to build simple, safe toilets in Water and Sanitation: Keys to Staying Healthy.



Wash your hands, and help children wash their hands too: Wash often and well with soap and water, or with ashes. Wash before preparing food and before eating, and after every time you pass stool. Help children to wash hands even more often – since they touch everything and frequently put their fingers in their mouths.



If a child is scratching his anus because of worms, he will easily re-infect himself or others. To prevent this:

- Cut the nails short, so feces and worm eggs do not stick under them.
- Wash the child's hands well each morning, before he eats, and after he passes stool.
- Have the child wear pants during the day. Put him in a snug diaper or pants before bed – so he cannot scratch his anus in his sleep.
- Prevent itching with a little Vaseline on the anus before bed.

Wash after you handle other people's stool: If you are caring for babies or an ill adult, dispose of their stool into a toilet. Wash their bottoms after they pass stool. And carefully wash your hands after. For more ideas on how to prevent worms and other diseases, see Water and Sanitation: Keys to Staying Healthy.

Other problems caused by these worms

Roundworm: A severe, untreated roundworm infection can cause problems in the gut or with breathing. Young worms dig into the lungs, causing wheeze, a dry cough, or pneumonia with coughing of blood. This person needs medical help.

When a person has a fever, or when she starts taking worm medicine, the worms may come out in the stools or crawl out through the mouth or nose. Occasionally this causes the person to choke.

Rarely, roundworms cause an obstruction of the gut (see page 8). Get medical help. Give mebendazole or albendazole on the way.

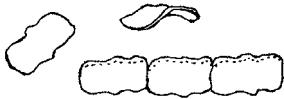
Whipworm: Whipworm can cause diarrhea, sometimes with blood. In severe infections, this leads to anemia (lack of iron in the blood, see page 8 in Good Food Makes Good Health).

Whipworm can also cause a child to push too hard when passing stool, which may cause a child's intestine to come part-way out of the anus. This is called rectal prolapse. Pour some cold water on it and it should pull back inside. If not, gently press it back in.



Children with a lot of worms may have hard, swollen bellies.

Worms spread by eating undercooked meat: tapeworm and trichina worm



Tapeworm (cestode), and tapeworm pieces (segments). These worms are white or yellow and up to several meters long. Depending on the type of tapeworm, you may see these segments in the stool.

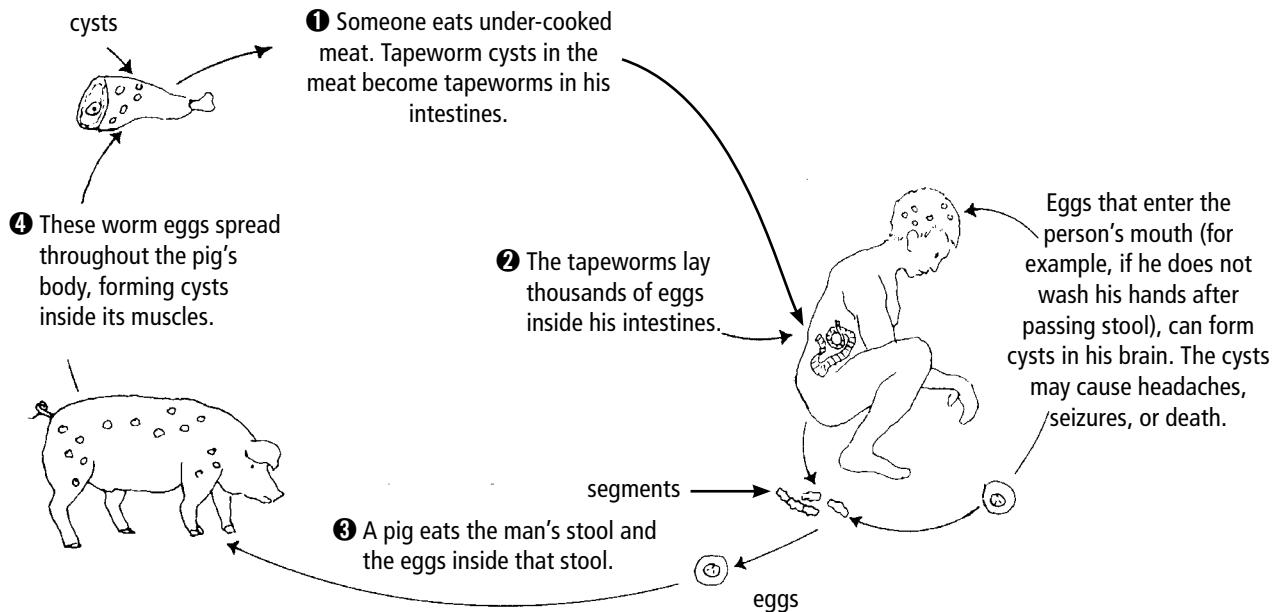


The trichina worm cannot be seen in the stool, but this is how it would look if you could see it burrowed into someone's muscle.

Tapeworms and trichina worms are spread by eating undercooked meat – usually pork. Fish, cows, and carnivores (animals that eat other animals) can also carry different types of these worms.

Tapeworm

The tapeworm lifecycle:



If you find a small, flat, white piece (segment) of tapeworm in the stool or underclothing, treat for tapeworm.

TREATMENT

Give niclosamide or praziquantel, see pages 55 to 56. If there are seizures, get medical help. The person will need anti-seizure and steroid medicines.



Trichinosis (trichina worm infection)

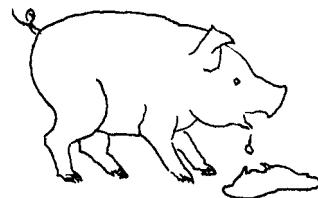
Within a week of eating infected meat, someone with trichinosis may get a stomach ache, nausea, and diarrhea. If everyone who ate the same pork has a stomach ache within a week of eating it, get treatment for trichinosis.

After a week the infection can spread to the muscles or brain causing:

- fever and chills.
- muscle pain or pain in the joints.
- swelling around the eyes or of the feet.
- bleeding in the whites of the eyes, pain in the eyes, or vision problems.
- small bruises.

TREATMENT

Give albendazole or mebendazole (see pages 54 to 55). Steroid medicines might be needed too.



PREVENTION FOR TAPEWORM AND TRICHINOSIS

- Pen pigs away from the house – so their stool is not tracked into the home or touched by children.
- Do not feed raw meat or feces to pigs – infection will follow.
- Cook meat well, especially pork. Cooking will kill tapeworm cysts.
- Wash hands after passing stool and before cooking or eating.

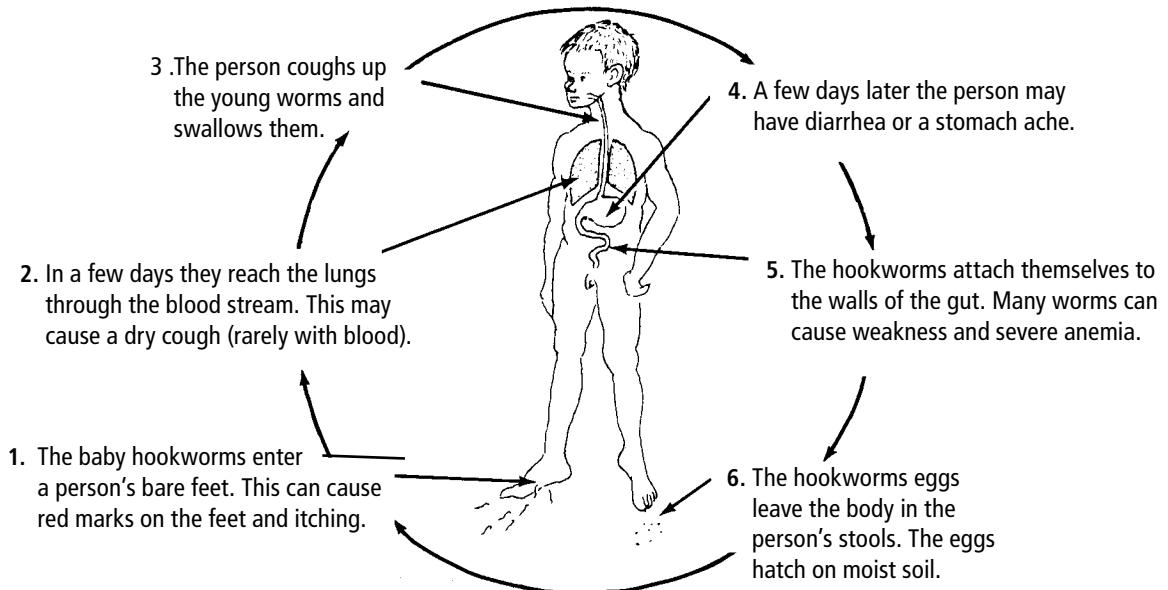
Hookworm



1 cm long, red

Hookworms can be one of the most dangerous diseases of childhood, because they feed off the child's blood and can cause anemia. A child who is anemic, pale, or eats dirt may have hookworms. If possible, his stools should be tested for hookworm.

How hookworms spread (start with number 1 below)



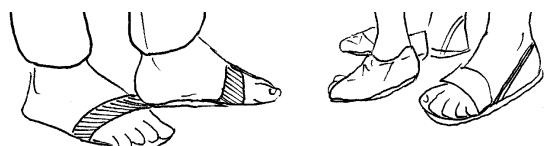
TREATMENT

Give mebendazole to treat hookworm. See page 54.

Treat anemia by eating foods rich in iron and taking iron tablets. See page 8 in Good Food Makes Good Health.



Protect children from hookworm: Build latrines and wear sandals or shoes.



Other Problems with the Bowels

Constipation

Hard, dry, or infrequent stool is called constipation. There may be pain in the belly. Most constipation is easily treated.

TREATMENT AND PREVENTION

- Do not take laxatives or purges. They can be dangerous – especially for children.
- Eat fruit every day.
- Eat whole grains – such as brown rice or whole wheat flour – instead of white processed grains.
- Squat to pass stool.
- Walk, move, and exercise more. People who are old, weak, or sick need to move more too. You may need to help them. No one should lie in one position all day.
- Drink more water. Try to drink 8 cups or more each day.

If there is still constipation after a few days of drinking more water and eating more fruit and grains, try mixing 2 to 6 spoonfuls of wheat bran or psyllium husk powder, or a tablespoon of ground flax seed, with food or water. (If you mix with food, be sure to drink a glass of water too. If not, these foods full of fiber may cause more constipation.)

If dry stool is painfully blocking the rectum, you may need to remove it. Put a little oil, Vaseline, or soap on a gloved finger and gently remove the stool by hand.

Constipation is a common side effect of iron tablets and strong pain medicines like morphine and codeine. Follow the same recommendations listed above. As your body adjusts to the medicine, the constipation will usually get less.



Stool from the vagina

If stool “leaks” from the vagina, there is a hole between the intestine and the vagina, called a fistula. This is often caused by a long and difficult birth when the baby's head presses for too long against one part of the vagina. Fistula can also be caused by rape. More often, the hole will form between the vagina and the bladder, causing leaking urine, so fistula is described in detail with other problems of the urine system in Difficulties with Urinating (in development).

Blood from the anus

Bright red blood from the anus is most often a hemorrhoid. Get help if there is a lot of blood, if there are blood clots coming from the anus, or if there is pain.

Any blood from the anus (red, dark red, or black) can also be a sign of cancer, see Cancer (in development).

DANGER SIGNS

- Stool that is black and looks like tar.
- Vomit with blood or that looks like coffee grounds.

Either of these signs means there is bleeding higher up in the intestine or in the stomach. This is always dangerous and requires medical help.

Itching or Painful Anus

Hemorrhoids, piles

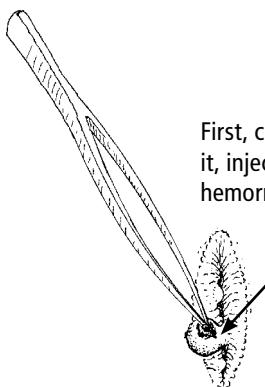
Hemorrhoids, also called piles, are swollen veins of the anus. They look puffy and feel like a lump near the anus. They may itch, burn, or hurt, especially during a bowel movement. Sometimes a hemorrhoid tears, causing a little bright red blood on the stool.

Hemorrhoids are common in pregnancy and in people who sit or carry heavy loads all day, but anyone can get them. They are made worse by constipation, because straining to pass stool stresses the veins in the anus.

TREATMENT

- Avoid constipation and hemorrhoids by drinking more water, and eating plenty of fresh fruit and whole grains.
- Certain bitter plant juices (such as witch hazel or cactus) dabbed on hemorrhoids helps shrink them.
- Sit in a shallow bath of warm water to clean the hemorrhoid and relieve the discomfort.

Sometimes a hemorrhoid gets clogged with a clot of blood. You will feel a tender, firm mass inside the swollen vein. This can be so painful that the person cannot sit. Relieve the pain by taking out the clot:



First, clean the anus with soap and water. If you have it, inject 5 ml of 1 percent lidocaine at the base of the hemorrhoid, here.

Use a sterilized blade to cut a small opening in the hemorrhoid. Use sterilized tweezers to pull out the clot. Put pressure on the cut with a clean cloth or gauze for a few minutes until the bleeding stops.

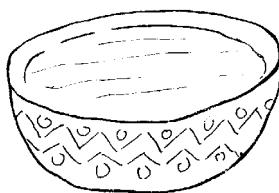
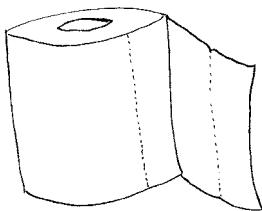
Do not cut hemorrhoids off. This can cause severe bleeding.

Raw or torn skin on the anus

An itching, stinging, or bleeding anus may be caused by a small tear in the skin. This can easily be confused with hemorrhoids or worms. Usually an adult with an itching anus does not have worms.

These tears are usually caused by rough wiping after passing stool. They are made worse by not cleaning the anus well.

- Do not wipe the anus with corn cobs, newspaper, or other rough materials.
- Instead, use toilet paper or a bowl of water to clean the anus after passing stool. Afterwards, wash hands well.



- Bathe regularly and clean the anus during bathing.
- Put Petroleum jelly (*Vaseline*) or ointment for diaper rash on the anus after cleaning it to help heal it. You can try a hydrocortisone cream, but do not use it for more than a week or it will weaken the skin.

Pain in the anus

Sometimes people get a swollen, red, painful lump next to the anus. It is filled with pus and is a kind of abscess. An abscess can lead to a hole between the anus and the skin and should be drained right away. Drain it as close to the opening of the anus as possible. See Skin, Nail, and Hair Problems (in development) for how to drain an abscess.

Most Belly Problems Can Be Avoided

You can prevent most belly problems by improving sanitation in the home and community, and by eating healthy food.

Water and Sanitation: Keys to Staying Healthy shows ways to make water safer to drink and to manage human waste to keep people healthy. If your family or neighbors often get stomach aches, diarrhea, or worms, read that chapter. Good Food Makes Good Health is about nutrition and how to eat for good health, which prevents stomach aches, nausea, and other belly problems.

Some other ways to prevent and treat these problems without medicines:

- Drink plenty of water, at least 8 cups every day and more when you are working or sweating a lot. This prevents constipation.
- Eat vegetables, fruits, and whole grains every day. This may prevent constipation and is important for general



health.

- Fatty, spicy, or acidic foods can cause belly aches. If your belly hurts, avoid these foods for a few weeks, to see if you feel better.
- Some people have painful gas or diarrhea when they eat milk or cheese. Try avoiding milk-based foods. (If avoiding a food does not help within a week or two, do not continue to avoid it.)
- Avoid cigarettes and alcohol. They cause stomach problems.
- Are you taking any medicines? Aspirin, ibuprofen, many antibiotics, and other medicines can hurt the stomach. For a few diseases, such as HIV, it is important to take a strong medicine for a long time. But for many illnesses, there is usually a different medicine you can take if the one you use causes belly problems. Maybe you do not need a medicine at all.
- Worry and stress give a lot of people belly aches. Mental Health (in development) gives ideas for how to stay calm when life is difficult.

Belly Pain, Diarrhea, and Worms: Medicines

Medicines for Diarrhea

Rehydration is the most important treatment for diarrhea no matter what is causing it. In many cases, rehydration and food are all that is needed. When there is giardia, dysentery (amebas or shigella), or cholera, especially in young children and old people, antibiotics and other medicines may also be helpful.

Giardia

Metronidazole (page 47) works best; give for 5 to 7 days. Quinacrine (page 50) can also be used and may be cheaper.

Amebic dysentery

Use metronidazole (page 47) for 7 to 10 days. Also use diloxanide (page 49).

Shigella

Shigella is resistant to several antibiotics, so it is very important to find out what medicines still work in your area. Try to find out what your local health authority recommends. You may be able to use ampicillin (page 43), or cotrimoxazole (see page 39 in Good Food Makes Good Health). But in many places there is resistance to these medicines, and ceftriaxone (page 48) should be used instead. Ciprofloxacin (page 48) can be used by adults, but avoid giving it to children. Whatever medicine you use, if there is no improvement after 2 days, change to a different antibiotic.

Cholera

Rehydration is essential to save the life of someone with cholera. Give rehydration drink constantly until the diarrhea has stopped and there are no more signs of dehydration. Then continue to give a cup of rehydration drink after every stool. Rehydration drink made with rice or maize meal may make it even more effective. See the recipe on page 22.

People with cholera or other severe cases of diarrhea should also be given zinc supplements. See page 50.

Antibiotics are not the most effective treatment for cholera, and in most places cholera is resistant to several antibiotics. Only give antibiotics when you know which ones work against cholera in your area. Start antibiotics by mouth after the person stops vomiting. Antibiotics that may be helpful include doxycycline, tetracycline, cotrimoxazole, ciprofloxacin, and erythromycin. Erythromycin is the safest for pregnant women and children.

There are vaccines that can help prevent cholera. They work best when a whole community is given the vaccine to prevent the spread of an outbreak. Ask your local health authority to distribute this.

Antibiotics

Antibiotics are medicines that fight infection from bacteria. They do not help against viral infections like chicken pox, rubella, flu, or the common cold. Not all antibiotics will fight all infections from bacteria. Antibiotics that share the same chemical make-up are said to be from the same family. It is important to know about the families of antibiotics for 2 reasons:

1. Antibiotics from the same family can often treat the same problems. This means you can use a different medicine from the same family.
2. If you are allergic to an antibiotic of one family, you will also be allergic to the other members of the same family of antibiotics. This means you will have to take a medicine from another family instead.

Antibiotics must be given for their full "course." Stopping before you have finished all the days of treatment, even if you feel better, can make the infection return in a form that is even harder to stop.

Ampicillin and Amoxicillin

Ampicillin and amoxicillin are broad-spectrum penicillins, which means they kill a wide-range of bacteria. The two are often interchangeable. When you see a recommendation for ampicillin in this book, you will often be able to use amoxicillin in its place, in the correct dose (see the next page).

Ampicillin and amoxicillin are very safe and are especially useful for babies and small children. When combined with other medicines, ampicillin is useful for ulcers and for peritonitis.

Side effects

Both these medicines, but especially ampicillin, tend to cause nausea and diarrhea. Avoid giving them to people who already have diarrhea, if you can give another antibiotic instead.

The other common side effect is rash. Raised, itchy bumps that come and go in a few hours are probably a sign of penicillin allergy. Stop giving the medicine right away and do not give the person a penicillin medicine again. Future allergic reactions may be more severe and even life-threatening. For some problems erythromycin can be used instead, see page 45. A flat rash that looks like measles, and usually starts a week after starting the medicine and takes days to go away, is not necessarily an allergy. But it is impossible to know for sure if the rash is from allergy or not, so it is usually better to stop the medicine.

Important

Resistance to these medicines is growing more common. Depending on where you live, they may not work any more against staphylococcus, shigella, or other infections.

How to use

Below we list doses to give amoxicillin orally, and ampicillin orally and by injection. When possible, give amoxicillin by mouth. Use ampicillin by injection for severe illnesses, or when someone is vomiting or cannot swallow.

As with other antibiotics, how long to give them can vary for many reasons. The general rule is to continue the medicine until all signs of infection (including fever) have been gone for at least 24 hours. For people with HIV, give the medicine for the full number of days listed. Likewise there is a range for how much to give. In general, give the lower amount for a thinner person or for less severe infection, and the higher amount for a fatter person or more severe infection.

AMOXICILLIN (ORAL)

- Give 45 to 50 mg per kg each day, divided into 2 doses a day. If you cannot weigh the person, dose by age:
 - Under 3 months:** give 125 mg, 2 times a day for 7 to 10 days.
 - 3 months to 3 years:** give 250 mg, 2 times a day for 7 to 10 days.
 - 4 to 7 years:** give 375 mg, 2 times a day for 7 to 10 days.
 - 8 to 12 years:** give 500 mg, 2 times a day for 7 to 10 days.
 - Over 12 years:** give 500 to 875 mg, 2 times a day for 7 to 10 days.

Continue giving amoxicillin until all signs have been gone for at least 24 hours.

AMPICILLIN (ORAL)

- Give 50 to 100 mg per kg each day, divided into 4 doses a day. If you cannot weigh the person, dose by age:
 - Under 1 year:** give 100 mg, 4 times a day for 7 days.
 - 1 to 3 years:** give 125 mg, 4 times a day for 7 days.
 - 4 to 7 years:** give 250 mg, 4 times a day for 7 days.
 - 8 to 12 years:** give 375 mg, 4 times a day for 7 days.
 - Over 12 years:** give 500 mg, 4 times a day for 7 days.

Continue giving ampicillin until all signs have been gone for at least 24 hours.

AMPICILLIN (INJECTION)

Ampicillin can also be given by injection, but should be injected only for severe illnesses, or when someone is vomiting or cannot swallow.

- Inject 100 to 200 mg per kg each day, divided into 4 doses a day. If you cannot weigh the person, dose by age:
 - Under 1 year:** inject 100 mg, 4 times a day for 7 days.
 - 1 to 5 years:** inject 300 mg, 4 times a day for 7 days.
 - 6 to 12 years:** inject 625 mg, 4 times a day for 7 days.
 - Over 12 years:** inject 875 mg, 4 times a day for 7 days.

Erythromycin

Erythromycin works against many of the same infections as penicillin or tetracycline, and it can be used by those who are allergic to penicillins.

Side effects



Erythromycin often causes nausea and diarrhea, especially in children. Do not use for more than 2 weeks as it may cause jaundice.

How to use



- Give 30 to 50 mg per kg each day, divided into 2 to 4 doses a day. Give for 7 to 10 days, or until 24 hours after all signs of infection are gone. If you cannot weigh the person, dose by age:

Newborns: give 65 mg, 2 times a day for 7 to 10 days.

Under 3 years: give 125 mg, 3 times a day for 7 to 10 days.

3 to 7 years: give 250 mg, 3 times a day for 7 to 10 days.

Over 8 years: give 250 to 500 mg, 4 times a day for 7 to 10 days.

For severe infections, double the doses above.

For cholera (where erythromycin works for cholera)

- Give the same doses listed above, but only for 3 days.

Tetracycline and Doxycycline

Tetracycline and doxycycline are broad-spectrum antibiotics that fight many different kinds of bacteria. They work well when given by mouth (and are very painful when injected, so they should not be given that way). There is a lot of resistance to these medicines, but they are still useful for fighting some infections.

Doxycycline and tetracycline can be used interchangeably. But doxycycline is usually a better choice because less is needed each day and it has fewer side effects.

Side effects



Heartburn, stomach cramps, diarrhea, and yeast infections are common.

Important ▲

- Pregnant women should not take these medicines because they can damage or stain the baby's teeth and bones. For the same reason, children under 8 years old should take them only when there is no other effective antibiotic and for short periods only. You can usually use erythromycin instead.
- Do not use tetracycline or doxycycline that is 'old' or past its expiration date.
- Some people may sunburn quickly or get a skin rash after spending time in the sun while taking these medicines, so stay out of the sun or wear a large hat.
- These medicines may make birth control pills less effective. If possible use another method (such as condoms) while taking these medicines.

How to use

TETRACYCLINE

Avoid milk, iron pills, and antacids for 2 hours before or after taking tetracycline. They will make the medicine less effective.

Take tetracycline on an empty stomach with plenty of water at least 1 hour before or 2 hours after meals.

For most infections

- Give 25 to 50 mg per kg each day, divided into 4 doses a day. Or dose by age:
 - 8 to 12 years:** give 125 mg, 4 times a day for 7 to 10 days.
 - Over 12 years:** give 250 mg, 4 times a day for 7 to 10 days.

For cholera (where tetracycline works against cholera)

- **8 to 12 years:** give 250 mg, 4 times a day for 3 days.
- Over 12 years:** give 500 mg, 4 times a day for 3 days.

DOXYCYCLINE

Avoid milk, iron pills, and antacids for 2 hours before or after taking doxycycline. They will make the medicine less effective.

Take doxycycline on an empty stomach with plenty of water at least 1 hour before or 2 hours after meals.

Doxycycline is taken once or twice a day (instead of 4 times a day like tetracycline). For more severe infections, give twice a day. But for most infections, give the first dose of doxycycline, then 12 hours later give a second dose. After that, give a double dose only one time each day. For example, if you give the first dose Monday night, then give the second dose Tuesday morning. Give a double dose Wednesday morning, and again on Thursday morning, and so on.

- Give 2 mg per kg in each dose, but do not give more than 100 mg per dose or 200 mg a day. Or dose by age:
 - 8 to 12 years:** give 50 mg per dose for 7 to 10 days.
 - Over 12 years:** give 100 mg per dose for 7 to 10 days.

For cholera (where doxycycline works against cholera)

- Give 6 mg per kg, one time only. Or dose by age:
 - 8 to 12 years:** give 150 mg, one time only.
 - Over 12 years:** give 300 mg, one time only.

Metronidazole

Metronidazole is used to treat gut infections caused by amebas, giardia, and certain bacteria.

Side effects



Nausea, cramps, and diarrhea are common. Taking with food may help. Sometimes it causes a metallic taste in the mouth or a headache.

Important

Do not give in the first 3 months of pregnancy. It may cause birth defects. Also avoid giving metronidazole later in pregnancy, and while breastfeeding unless it is the only effective medicine and is definitely needed. Do not drink alcohol while taking metronidazole or until 2 days after you finish taking it. Drinking alcohol while taking metronidazole causes severe nausea. Do not use metronidazole if you have liver problems.

How to use



For many problems, you can give a high dose of this medicine for 3 days, or a lower dose for 5 to 10 days. Pregnant women should avoid the high dose treatments.

For giardia

- Give 15 mg per kg each day, divided into 2 or 3 doses a day, for 5 to 7 days. Or dose by age:
 - Under 3 years:** give 62 mg ($\frac{1}{4}$ of a 250 mg tablet), 2 times a day for 5 days.
 - 3 to 7 years:** give 62 mg, 3 times a day for 5 days.
 - 8 to 12 years:** give 125 mg, 3 times a day for 5 to 7 days.
 - Over 12 years:** give 250 mg, 3 times a day for 5 to 7 days. **OR**
Give 2 grams, once a day for 3 days.

For amebic dysentery

- Use 30 mg per kg each day, divided into 3 doses a day, for 8 to 10 days. Or dose by age:
 - Under 3 years:** give 62 mg ($\frac{1}{4}$ of a 250 mg tablet), 3 times a day for 8 to 10 days.
 - 3 to 7 years:** give 125 mg, 3 times a day for 8 to 10 days.
 - 8 to 12 years:** give 250 mg, 3 times a day for 8 to 10 days.
 - Over 12 years:** give 500 to 750 mg, 3 times a day for 8 to 10 days.

After the last dose of metronidazole, take **diloxanide furoate** (see page 49).

For peritonitis or appendicitis

- Give along with other antibiotics. See page 51 for instructions.

For ulcers

- Give metronidazole with omeprazole and amoxicillin. See page 53.

Ciprofloxacin

Ciprofloxacin is a broad spectrum antibiotic of the quinolone family. It works against a lot of different infections of the skin, bones, digestive tract, and urinary tract (bladder). But there is resistance to ciprofloxacin in many parts of the world, so use it only against the infections for which it is specifically recommended in your area. It is not a good antibiotic for children.

Side effects



Nausea, diarrhea, vomiting, headache, dizziness, rash, or yeast infections.

Important ▲

Do not use if you are pregnant or breastfeeding. Do not take with dairy products.

Rarely, ciprofloxacin damages the tendons. Except for a few specific situations, it should not be given to children under 16 because their tendons are still developing. If you have pain in your calves when taking this medicine, stop taking it immediately.

How to use



For most infections

- Give 250 to 750 mg, two times a day until 24 hours after signs of infection are gone.

For shigella

- Give 500 mg, 2 times a day for 3 days.

For cholera (where ciprofloxacin works against cholera)

- Give 1 gram (1000 mg), one time only.

For appendicitis or peritonitis

- Give ciprofloxacin with other antibiotics. See page 50.

Ceftriaxone

Ceftriaxone is a strong antibiotic used against serious infections and for infections resistant to penicillin. Only use ceftriaxone to treat the specific infections for which it is recommended in your area. This will help prevent resistance and keep this drug useful.

Side effects



Can be painful to inject. Mix with 1% lidocaine if you know how.

Important ▲

Do not give to a baby less than 1 week old. Do not use if there is jaundice.

How to use



Ceftriaxone cannot be taken by mouth. When injecting, put the needle deep in the muscle.

For severe infection

The doses are different depending on the infection, but in general you can give 50 to 100 mg per kg in children, and 1 to 4 grams in adults, once or twice a day.

For shigella

- Inject 50 mg per kg, once a day for 5 days. Or if you cannot weigh the person, dose by age:
 - 1 week to 3 years:** inject 250 mg, once a day for 5 days.
 - 3 to 7 years:** inject 500 mg, once a day for 5 days.
 - 8 to 12 years:** inject 1000 mg, once a day for 5 days.
 - Over 12 years:** inject 1 to 2 grams, once a day for 5 days.

Other Medicines for Diarrhea

Diloxanide furoate

Diloxanide is used in combination with antibiotics to treat amebas. If you cannot get this medicine, try paromomycin or iodoquinol instead.

Side effects

Occasionally causes gas, stomach pain, or nausea. Take with food.

Important

Do not use diloxanide during the first 3 months of pregnancy. Avoid this medicine while breastfeeding.

How to use

After completing metronidazole or another treatment for amebas, begin taking diloxanide.

- Use 20 mg per kg each day, divided into 3 doses a day for 10 days. If you cannot weigh the person, dose by age.
 - Under 3 years:** give 62 mg ($\frac{1}{6}$ of a 500 mg tablet), 3 times a day for 10 days.
 - 3 to 7 years:** give 125 mg, 3 times a day for 10 days.
 - 8 to 12 years:** give 250 mg, 3 times a day for 10 days.
 - Over 12 years:** give 500 mg, 3 times a day for 10 days.

Quinacrine

Quinacrine works well for treating giardia, but makes people feel very sick. It is used because it is inexpensive.

Side effects



Headaches, dizziness, and vomiting are common.

How to use



For giardia

→ **Under 10 years:** give 50 mg, 3 times a day for 1 week.

Over 10 years: give 100 mg, 3 times a day for 1 week.

Zinc

Zinc helps people with diarrhea get better faster. It should be given along with rehydration drink.

How to use



For babies, tablets can be ground up and mixed with breast milk or a little water. You may be able to get a "dispersible tablet" which dissolves quickly and easily in liquid.

→ **Newborn to 6 months:** give 10 mg, once a day for 10 to 14 days.

Over 6 months: give 20 mg, once a day for 10 to 14 days.

For Peritonitis and Appendicitis

A number of different antibiotics can be used to treat peritonitis, but always use at least 2 antibiotics to kill as many different bacteria as possible. For peritonitis, it is best to inject antibiotics because the digestive system will not work well enough to use medicines taken by mouth. If you do give antibiotics by mouth, give only as much water as is needed to swallow the pills. The person should not eat or drink anything else.

Give these medicines until the person has reached the hospital:

METRONIDAZOLE 500 mg, 4 times a day

AND

CIPROFLOXACIN 500 mg, 2 times a day **OR**

CEFTRIAXONE 2 grams, once a day **OR**

AMPICILLIN 2 grams, 4 times a day **AND** GENTAMICIN 1.5 mg per kg, 3 times a day.

For Acid Indigestion, Heartburn, and Stomach Ulcers

First try treating heartburn and stomach upset with simple antacids. If they keep coming back, you will need stronger antacid medicines. If the stomach pain is caused by an ulcer, you will probably need to give a combination of antacid medicines and antibiotics to really cure the problem. For that combination of medicines, see page 53.

Antacids

Antacids cost little and offer short-term relief from stomach pain and heartburn. None of them works for long, but for occasional problems they can help. They are sold under many different brand names, come as liquids or chewable tablets, and are made of aluminum hydroxide, magnesium hydroxide, calcium carbonate, or bismuth.

Aluminum hydroxide, magnesium hydroxide, milk of magnesia, cream of magnesia

These antacids can be used occasionally for acid indigestion or heartburn, or as a regular part of treatment of a stomach (peptic) ulcer.

Important ▲

These medicines interfere with tetracycline and a number of other medicines. If you are using another medicine, take it 2 hours before or after these antacids.

Side effects

Antacids with magnesium sometimes cause diarrhea, and those with aluminum may cause constipation.

How to use

Take an antacid when you have pain, often about an hour after meals. Or take before bedtime to prevent problems when you lie down. Chew 1 or 2 tablets, or drink 10 ml (about 2 teaspoons) syrup. It is OK to use these 4 or 5 times a day, but if you have to take this much for several days in a row, you probably need a different treatment.

Calcium carbonate

Calcium carbonate is effective for occasional acid indigestion or heartburn. Chew one 850 mg tablet or two 350 mg tablets when symptoms occur. If necessary, take another dose in 2 hours.

Sodium bicarbonate, bicarbonate of soda, baking soda

Sodium bicarbonate should be used only occasionally for stomach upset with heartburn or acid indigestion. Do not treat chronic indigestion or ulcers with it. Although it helps at first, sodium bicarbonate causes the stomach to produce more acid, which soon makes things worse. As an occasional antacid, mix $\frac{1}{2}$ teaspoon of sodium bicarbonate with water and drink it.

Alka-Seltzer is a combination of sodium bicarbonate and aspirin. If you have an ulcer, the aspirin in it will make the ulcer worse.

Important

Persons with heart disease, or with swelling of the feet or face, should not use sodium bicarbonate or other products that contain sodium.

Bismuth

Bismuth usually comes as a pink liquid. It is used for heartburn, stomach ache, diarrhea, or gas (painful, bloated stomach and farting). It can be used in combination with other medicines to treat ulcer. See page 54.

Side effects

Sometimes this medicine turns the tongue or feces black. This is harmless and goes away when you stop taking the medicine.

Important

Do not give to children with fevers. Like aspirin, it may cause health problems in children with infections caused by viruses.

How to use

Do not give within 2 hours of tetracyclines. It will stop them from working well.

- Give 2 tablets or 30 ml of liquid, once an hour as needed. Do not give more than 16 tablets or 240 ml in 24 hours.

Stronger acid-reducing medicines

New medicines for heartburn and ulcer work better than the old antacids, but they can be expensive. There are two kinds of new antacids, called Histamine 2 Receptor Antagonists (H2 Blockers) and Proton Pump Inhibitors (PPIs). Of the two groups, PPIs work best but are more expensive. Medicines within each group usually work equally well, so choose the H2 Blocker or PPI that is least expensive.

Omeprazole

Omeprazole is a PPI. Like other PPIs, it can calm pain and help an ulcer heal. To treat an ulcer, try using omeprazole alone for 8 weeks. If the ulcer and pain come back, try using omeprazole again with a combination of antibiotics to cure the problem. See page 54 for the combined treatment.

If you do not have good results with omeprazole, try a different PPI instead.

How to use

- Give 20 to 40 mg, once a day.

Start with 20 mg, and if pain does not improve, increase to 40 mg.

If the ulcer or pain comes back within 6 months after taking omeprazole, also use antibiotics to cure the ulcer.

Ranitidine

Ranitidine is an H2 blocker. Like other H2 blockers, it can calm pain and help an ulcer heal. But if the pain comes back within 6 months of taking ranitidine, also use antibiotics to cure the ulcer.

How to use

- Give 150 mg twice a day, or 300 mg with the evening meal, for 4 to 8 weeks.

To cure an ulcer

Give a combination of antacid medicines and antibiotics. There are many combinations that will work. Most include one PPI and two antibiotics. Often bismuth is added as well. If you do not have a PPI, an H2 blocker may work instead.

Here is one combination:

Omeprazole 40 mg, (or another PPI) once a day for 1 or 2 weeks

AND

Metronidazole 500 mg, twice a day for 1 or 2 weeks

AND

Amoxicillin 500 mg, 3 times a day for 1 or 2 weeks.

Or, this is another option:

Omeprazole 40 mg, (or another PPI) once a day for 1 week

AND

Metronidazole 250 mg, 4 times a day for 1 week

AND

Tetracycline 500 mg, 4 times a day for 1 week

AND

Bismuth 525 mg, 4 times a day for 1 week.

Do not take tetracycline and bismuth at the same time. Wait 2 to 3 hours after taking one, and then take the other.

Medicines for Worms

Medicines by themselves are not enough to get rid of worm infections for very long. Personal and public cleanliness is also necessary. Worm infections can spread easily among family members, so when one person has worms it is wise to treat the whole family too.

Mebendazole

Mebendazole works against hookworm, whipworm, roundworm, and pinworm (threadworm). It also works well for infections of several different worms. It may do some good against trichinosis, but is not the best medicine for this. Although side effects are not common, there may be some gut pain or diarrhea if the person is infected with a lot of worms.

Important

Avoid mebendazole during the first 3 months of pregnancy when it can harm the developing baby. Do not give to children under 1 year old.

How to use

For pinworm

→ **1 year to adult:** give 100 mg, one time by mouth. Repeat in 2 weeks if necessary.

For roundworm (Ascaris), **whipworm** (Trichuris) and **hookworm**

→ **1 year to adult:** give 100 mg, 2 times a day for 3 days (6 tablets in all). **OR**
give one 500 mg tablet, one time only.

To prevent roundworm where this infection is common

→ **1 year to adult:** give 500 mg, every 3 to 6 months.

For trichinosis

→ **1 year to adult:** give 200 to 400 mg, 3 times a day for 3 days. Then give 400 to 500 mg, 3 times a day for another 10 days. If there are pain or vision problems, also give a steroid, for example prednisolone, 40 to 60 mg, once a day for 10 to 15 days.

Albendazole

Albendazole is similar to mebendazole but often more expensive. It works against hookworm, whipworm, roundworm, pinworm, and trichinosis. Side effects are rare.

Important

Avoid albendazole during the first 3 months of pregnancy when it can harm the developing baby. Do not give to children under 1 year old.

How to use

For pinworm, roundworm (Ascaris), **whipworm** (Trichuris), and **hookworm**

- **1 to 2 years:** give 200 mg, one time.
- Over 2 years:** give 400 mg, one time. Repeat in 2 weeks if needed.

For trichinosis

- Give 400 mg, 2 times a day for 8 to 14 days. If there are pain or vision problems, also give a steroid, for example prednisolone, 40 to 60 mg, once a day for 10 to 15 days.

Pyrantel pamoate, pyrantel embonate

Pyrantel works for pinworm, hookworm, and roundworm (Ascaris), but it may be expensive. It occasionally causes vomiting, dizziness, or headache. Do not give it to someone also taking piperazine (another anti-worm medicine).

How to use

For hookworm and roundworm: give one dose only.

For pinworm: give one dose, wait 2 weeks, then give another dose.

- Give 10 mg per kg. If you cannot weigh the person, dose by age:
- Under 2 years:** give 62 mg ($\frac{1}{4}$ of a 250 mg tablet).
- 2 to 5 years:** give 125 mg ($\frac{1}{2}$ of a 250 mg tablet).
- 6 to 9 years:** give 250 mg (one 250 mg tablet).
- 10 to 14 years:** give 500 mg (two 250 mg tablets).
- Over 14 years:** give 750 mg (three 250 mg tablets).

For Tapeworm

There are several types of tapeworm. Praziquantel or niclosamide both work for all types. If the tapeworm infection is in the brain or causes seizures, the person needs albendazole and anti-seizure medicines instead, and should get help.

Praziquantel

Side effects

Praziquantel may cause tiredness, dizziness, headache, loss of appetite, and nausea, but these side effects are rare at the low doses used to treat tapeworm.

How to use

For most kinds of tapeworm, including beef and pork tapeworm

- Use 5 to 10 mg per kg, one time only. Or dose by age:
- 4 to 7 years:** give 150 mg ($\frac{1}{4}$ tablet), one time only.
- 8 to 12 years:** give 300 mg, one time only.
- Over 12 years:** give 600 mg, one time only.

For dwarf tapeworm (H. nana)

- Use 25 mg per kg in one dose. Then repeat in 10 days. Or dose by age:
 - 4 to 7 years:** give 300 to 600 mg ($\frac{1}{2}$ to 1 tablet) per dose.
 - 8 to 12 years:** give 600 to 1200 mg per dose.
 - Over 12 years:** give 1500 mg per dose.

Niclosamide

Niclosamide works against tapeworm in the gut, but not against cysts outside the gut.

How to use

Take niclosamide after a small morning meal. Tablets must be chewed well and swallowed. The dose may differ depending on the type of tapeworm, so your local health authority may have a good recommendation. If not, use the dose below.

Chew well and swallow the following doses. If a small child cannot yet chew, crush the tablet and mix with a little breast milk or food.

- **Under 2 years:** give 500 mg, one time only.
- 2 to 6 years:** give 1 gram (1000 mg), one time only.
- Over 6 years:** give 2 grams, one time only.

For Numbing

Lidocaine, Lignocaine

Lidocaine is an anesthetic that can be injected around the edges of a wound to make the area numb so it will not hurt. This is useful before draining an abscess or stitching up a wound. If you decide to remove a blood clot from a painful hemorrhoid, use lidocaine first.

How to use

Inject both into and under the skin around where you are going to cut or sew, at points about 1 cm apart. First, clean the skin well, then slowly inject the lidocaine. Use about 1 ml of anesthetic for each 2 cm of skin. (Do not use more than 20 ml altogether.)

See Medicines, Tests, and Treatments (in development) for how to safely give injections.

Sexually Transmitted Infections

Sexually transmitted infections (STIs) are infections that pass from one person to another during sex.

Most types of sex can spread a STI. It can be penis to vagina sex, penis to anus sex, or oral sex (mouth to penis, mouth to vagina). Sometimes STIs can pass from just rubbing an infected penis or vagina against another person's genitals.

Signs caused by STIs include pain during sex, unusual discharge from the vagina, penis, or anus, or bumps, sores, or blisters on the genitals.

It is very common to have a STI and have no signs at all. Even if there are no signs, the STIs can pass from one person to another. Getting tested is the best way to find out if you have a STI and find the right treatment to cure it. In places where testing is not available, it is still important to treat infections right away. Help any person you have had sex with to also get tested and treated. If both of you do not get treated, you will get infected again and infect other people.

Most STIs are cured after treatment with antibiotics. Other STIs do not go away but can be managed with medicine. There are also treatments to reduce pain and help with discomfort while the medicine takes effect (see How to feel better while you heal from a STI, page 19).

Not having sex or being certain your sex partner does not have a STI are the best ways to prevent STIs. Because this is not always possible, prevent infections from sex by using condoms every time as another way to make getting a STI less likely (page 21). Health workers can play an important role by treating people with STIs with respect and dignity (see page 26).

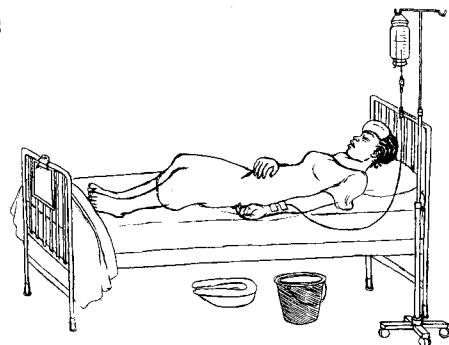


It is hard to talk about sex! Helping people protect themselves, get testing, and find treatment will stop STIs from spreading.

Why STIs are a serious problem

Because sex is normal and common, STIs are also common. When STIs are not treated, they can harm women, men, and children. STIs can cause:

- infertility in both women and men.
- babies born too early, too small, blind, sick, or dead.
- death from severe infection.
- lasting pain.
- cancer of the cervix or throat or anus.
- increased risk of getting other STIs, including HIV.



How STIs pass to partners through sex

Both men and women can get STIs. But the person on the receiving end of intercourse, getting penetrated in the vagina or anus, is more at risk. Without a condom, semen which may carry infection stays inside the vagina, anus, or mouth. The action of penetration can rub and open the skin inside the vagina or anus, increasing the possibility that an infection enters the body. This happens even if the person doesn't notice there are sores inside the vagina or anus. Sores or irritation on the outside part of the genitals can also pass STIs, including HIV, more easily.

What to do if you might have a STI

- Get tested if testing is available
- Get treated for the infection right away, do not wait to become more ill.
- Help your partner get treated at the same time. That way you will not get the infection again if you have sex together.



Do I Have a Sexually Transmitted Infection?

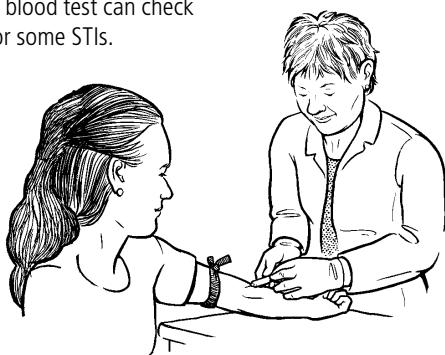
Signs of STIs include discharge, pain, and sores in the genitals. But many STIs cause no signs. Even without signs, STIs can pass from one person to another during sex without condoms. Tests of samples of blood, urine, or swabbing the affected part of the body are used to know which STI a person has. Tests are also part of regular health care to find and treat STIs that cause no signs.

Testing for STIs

To test for STIs, the health worker takes a sample from the person and may use a test kit or look for the infection using a microscope. Types of STI tests include:

- Using a swab on the genital area gives a sample to test for chlamydia, gonorrhea, genital herpes, chancroid, or trichomonas. Swabbing the inside of the mouth can test for HIV. Swabbing the throat or anus is sometimes needed to test for a STI from oral or anal sex. Swabbing the cervix can test for HPV.
- Urine tests can detect chlamydia and gonorrhea.
- Blood tests can detect syphilis, genital herpes, hepatitis, and HIV.

A blood test can check for some STIs.



Testing for STIs is a good idea for all people who are sexually active. How often can depend on if you have a new partner, more than one partner, or have a reason to think you may have a STI. If you are pregnant, it is common to test for STIs that can harm the baby or cause harm to you.

If you have a STI, get tested as well for other common STIs because 2 or more are often passed at the same time.

Signs that could be a STI

Pain or unusual discharge from the vagina in women

- ?
- Is there pain in the lower belly or pain during sex? → This could be **pelvic inflammatory disease (PID)**, see page 11.

- ?
- Is there pain or burning while urinating? → This could be a urinary infection, not a STI (see Difficulties With Urinating, in development). Or, this could be **trichomonas, gonorrhea, or chlamydia**, see page 9.

- ?
- Is the discharge white or gray and smell bad or like fish, especially after sex? → This could be **bacterial vaginosis**. See page 6. Or less commonly, **trichomonas**, see page 9.

- ?
- Is the discharge yellow or green? → This could be **gonorrhea** or **chlamydia**, see page 9. It could also be an infection of **trichomonas**, see page 9.

- ?
- Is the discharge white, looks like cottage cheese or buttermilk, and smells like mold, mildew or baking bread? → This could be a **yeast** infection, which is not a STI, see page 7.

Pain or unusual discharge from the penis in men

- ?
- Is there pain or burning while urinating? → This could be **gonorrhea** or **chlamydia**, see page 9. Or less commonly, **trichomonas**, see page 9.

- ?
- Is there pain or painful swelling in the testicles? → This could be **gonorrhea** or **chlamydia**, see page 9. Other causes also need treatment so talk to a health worker.

- ?
- Is there discharge from the penis that just drips and drips? → This could be **gonorrhea**, see page 9.

Ulcers, sores and growths on the genitals or near the anus

- ? Is there a painless open sore, with raised edges? → This could be **syphilis**, see page 12.
- ? Is it 1 or more painful sores that are puffy and bleed easily? → This could be **chancroid**, see page 12.
- ? Are there small blisters that burst and form painful, open sores? → This could be **herpes**, see page 14.

Other signs in men or women in genitals or anus

Itching of the anus or pain passing stool can sometimes be the sign of a STI. Also if you notice discharge coming out of your anus or that it is slippery when you wipe your bottom, this could be a sign of **gonorrhea**, or **chlamydia**, see page 9.

Get medical help for signs of a more serious infection that include discharge from the vagina, penis or anus that is bloody or brown.

Itching of the genitals Itching around the opening of the vagina, on the thighs or where urine comes out could be **yeast** (see page 7) or, for women, a sign of **trichomonas** (see page 9).

Itchy genitals could also be pubic lice or scabies, which are very tiny bugs that live on the skin, treated with medicines put on the skin, such as those with permethrin (see Skin Problems, in development). Scabies are spread easily between family members, are common in children, and affect many parts of the body.

Itching can also be caused by soaps, perfumes, or chemicals put on or in the genitals. Rinse the outside of the genitals with plain water to see if the itching goes away.

Fluid (discharge) from the vagina

It is normal for women to have wetness and some fluid come from the vagina in between menstrual periods. This is the way the vagina cleans itself. The fluid changes during the days of the monthly cycle and also during pregnancy. Fluid that is clear, milky or slightly yellow is normal, but if there is more than usual, or it is deep yellow, green or thick white, has a bad smell or has itching or irritation, then it is called a “discharge” and could be a STI. Get help for unusual signs or discomfort.

Many good types of bacteria grow in the vagina to keep it healthy. Too much stress, taking antibiotics, being pregnant, and other conditions affect the bacteria and make vaginal infections more likely. Prevent infections in the vagina by washing daily, and avoiding perfumes, perfumed soaps, douches, or sprays on the genital area or inside the vagina. Limiting coffee, alcohol and sugary foods or drinks may decrease vaginal infections.

Bacterial Vaginosis (BV, gardnerella)

Bacterial vaginosis is a bacterial infection of the vagina. Soaps, perfumes, or deodorants that get in the vagina can make this infection easier to get. If sex irritates the vagina, it makes BV more likely. It is not usually dangerous, but can cause pregnant women to have their babies early or get an infection after giving birth.

SIGNS

- more discharge than usual
- a bad, fishy smell from the vagina, especially after sex
- mild itching

TREATMENT

Take one of these: metronidazole (page 35) by mouth or inserted vaginally, tinidazole by mouth (page 37), or clindamycin (page 33) by mouth or inserted vaginally. If you are pregnant, use metronidazole by mouth.

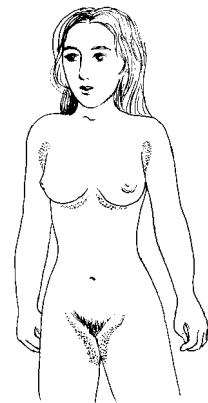
Check if the medicine is meant to be taken by mouth or put into the vagina.



Yeast (moniliasis, candida, thrush)

Yeast affects the genitals and that makes people think it is a STI, but yeast is not usually passed through sex. Usually yeast is not dangerous but it can be very uncomfortable. You are most likely to have a yeast infection when you are pregnant, taking antibiotics, or have some other illness such as diabetes or HIV infection. Yeast is most common in women but men can get yeast infections too. In men it can lead to inflammation of the head of the penis and itching of the scrotum. Both men and women can get thrush infections of the throat.

Yeast can also appear on the inner thighs, armpits, under the breasts, or around the anus. Yeast is most common where body parts touch each other and are covered, conditions that let skin stay moist.



SIGNS IN WOMEN

- white, lumpy discharge from the vagina, like milk curd or yogurt
- bright red skin outside and inside the vagina which may bleed
- feeling very itchy inside or outside the vagina
- a burning feeling when passing urine

SIGNS IN MEN

- a thick, white discharge collects in skin folds and under the foreskin of the penis
- patches of red bumps on the head of the penis
- itching, burning, or redness on the penis or scrotum

TREATMENT

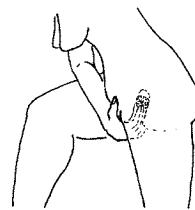
Mild yeast infections will sometimes go away without medicines. Natural treatments can reduce the itching.

Natural treatments:

Rinsing off the discharge with clean water will help. Or mix plain yogurt (with no sugar or flavors) or 1/4 cup of vinegar into a pan of clean warm water. Sit in this liquid for 20 to 30 minutes. If it helps you feel better, do this 2 times a day.



OR Mix 3 tablespoons of vinegar with 1 liter of boiled cool water. Soak a piece of clean cotton wool in this mixture and insert the cotton into the vagina every night for 3 nights. Remove the cotton each morning. Men can use the cotton prepared the same way to bathe the penis or scrotum.



Treatment with medicines:

Use one of these:

Gentian violet liquid (page 38) on the vagina, penis, or scrotum each night for 7 nights

OR

Miconazole cream (page 39), nystatin cream (page 39), or clotrimazole (page 38) cream or tablets on or inside the vagina or on the penis or scrotum, each night for 7 nights. These medicines are safe to put on the vagina during pregnancy.

Men may take longer to treat.

PREVENTION

Wear loose clothing and underclothes to let air reach the genitals. This helps prevent yeast. Wash or change underclothes often. Do not put soap in the vagina when bathing. Do not douche. If you have diabetes or HIV, taking your medicines correctly and caring for your health helps avoid yeast problems.

Trichomonas (trich)

Trichomonas is an infection caused by a parasite. For women, it is very uncomfortable and itchy. Men usually have no signs. If the infection is inside the penis, it can pass to a woman during sex without a condom.

Trichomonas is not dangerous but can irritate the vagina, which makes it easier for a woman to get other STIs, including HIV.

SIGNS

- discharge that is gray, yellow, or green
- bad-smelling discharge
- red and itchy vagina
- pain or burning while urinating

To feel better, sit in a pan of clean, warm water for 15 minutes as often as possible. This is soothing to the genitals and will speed healing. Avoid sex until you and your partner are finished with treatment and all the signs are gone.



Bad-smelling discharge from the vagina is often trichomonas.

TREATMENT

Take metronidazole (page 35) or tinidazole (page 37) by mouth. Pregnant women should not take tinidazole.

Treat the person's partner or partners with the same medicine.

Gonorrhea and Chlamydia

Both women and men can have gonorrhea and chlamydia, even if they have no signs. If gonorrhea or chlamydia is not treated, either can lead to severe infection or infertility in women and men.

Every pregnant woman should be tested for gonorrhea and chlamydia because her baby can get these infections during childbirth. If the test shows she has gonorrhea or chlamydia or both, both she and her partner should be treated. If she or her partner has signs of infection, but testing is not available, they should be treated anyway. Gonorrhea and chlamydia have similar signs.

SIGNS IN WOMEN

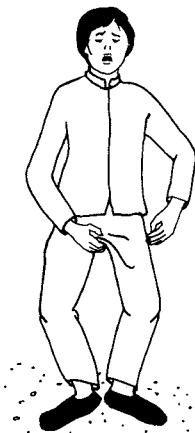
- yellow or green discharge from the vagina or anus
- pain in the lower belly
- fever
- pain during sex
- pain or burning while urinating

If a woman has gonorrhea or chlamydia and also has fever and pain in the lower belly, she may have pelvic inflammatory disease (see page xx).

SIGNS IN MEN

- drip of pus from the penis or anus
- painful swelling of the testicles
- pain or burning while urinating

In a man, the first signs begin 2 to 5 days (or up to 3 weeks or more) after sexual contact with an infected person. In a woman, signs may not show up for weeks or months. But a person who does not have any signs can still pass the disease to someone else, starting a few days after infection.



TREATMENT

Treatment works best when started early. Be sure to take all the medicine, even if you begin to feel better. Treat the person's partner or partners with the same medicine.

It is best to treat for both gonorrhea and chlamydia unless tests confirm that the person only has one. Using a combination of 2 medicines for gonorrhea will also treat chlamydia. If a test shows that there is chlamydia but no gonorrhea, only one medicine is needed. The chart on page 42 shows different combinations and treatment depending on available medicines.

Because gonorrhea is becoming increasingly resistant to antibiotics, it is best to seek local advice about which medicines are effective, available, and affordable in your area. If the drip and pain have not gone away in 2 or 3 days after starting treatment, it could mean the gonorrhea is resistant to the medicine and a different medicine is needed.

Pelvic Inflammatory Disease (PID)

Pelvic Inflammatory Disease or PID is the name for an infection of any of the reproductive parts in a woman's lower belly. It is often called a "pelvic infection."

Pelvic infection can develop if you have had a STI that was not cured, especially gonorrhea or chlamydia. But not all PID is from a STI. Other causes of PID include infection after birth, miscarriage, and abortion, or, rarely, because an IUD (Intra-Uterine Device) was put in the uterus without following the necessary sterile procedures.

The germs that cause pelvic infection travel from the vagina through the cervix and into the womb, tubes, and ovaries. If the infection is not treated in time, it can cause chronic pain, infertility, serious illness, or death.



SIGNS (YOU MAY HAVE ONE OR MORE OF THESE)

- pain in the lower belly (pelvis) – it can be mild or severe
- pain or bleeding during sex
- tenderness when you press on the lower belly
- fever
- feeling very ill and weak
- unusual bleeding or bad-smelling discharge from the vagina

TREATMENT

If you are very ill with a high fever or vomiting, or if you are pregnant or recently had an abortion or gave birth, go to a health center or hospital immediately. You will need medicines given in the vein (IV).

If the signs are beginning and not yet severe, use medicines by mouth to treat. This infection is usually caused by a mix of germs, so at least 2 kinds of medicines are needed. See Medicine combinations to treat Pelvic Infection (PID) on page 43. Start treatment right away. If you do not feel better after 2 days, get medical help.

If you have PID, your partner or partners will need to be tested and treated for infection.

Syphilis and Chancroid

Syphilis is a serious STI that over time affects the whole body. The first sign is a painless sore that goes away. If the person does not notice it and does not get treated, the syphilis will stay in the body. All pregnant women should be tested for syphilis and treated so it does not pass to the baby and cause the baby to be born too early, deformed, or dead. If you have HIV or another STI, often a health worker will test you for syphilis too.

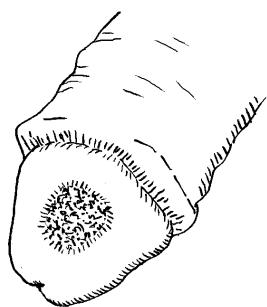
Chancroid is a STI caused by bacteria that causes painful sores on the genitals and enlarged, very painful lymph nodes. Like syphilis, if treated early it can be cured with medicines.

If you are not sure whether a person has one or the other or both syphilis and chancroid, treat for both. Also treat for both if a test shows both or if both are very common in your area. See Medicine combinations to treat both syphilis and chancroid, on page 44. Treat the person's partner or partners with the same medicines.

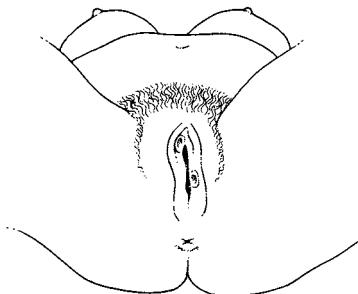
Other infections can easily pass through a sore on the genitals, especially hepatitis B, HIV, and other STIs. To prevent spreading or getting these infections, get treatment and avoid sex until the sores heal.

Keep the sores clean while they are healing. Wash them every day with soap and water, and dry carefully. Do not let anyone else use the cloth you dry with.

Syphilis or chancroid sore on a man's penis



Syphilis or chancroid sores on a woman's genitals



Although syphilis and chancroid both start with sores, sores from syphilis usually are not painful.
A chancroid sore is usually painful.

SIGNS OF SYPHILIS

The first sign is usually a small, painless sore, called a chancre, which appears 2 to 5 weeks after sexual contact with a person who has syphilis. The chancre at first looks like a bump, then it breaks open to form a sore. It usually appears in the genital area but may also appear on the mouth or anus. In women, the sore might be inside the vagina and not noticed.

The sore lasts a few days to a few weeks and then goes away without treatment. Weeks or months later, you might get a rash (especially on the palms of the hands and soles of the feet), sore throat, mild fever, or mouth sores. Any strange rash or skin condition that shows up days or weeks after a sore on the genitals may be syphilis. Get tested and treated quickly. Without treatment, syphilis can spread to other parts of the body, causing heart disease, paralysis, mental impairment, and even death. Because syphilis is so dangerous, many countries have free testing programs.

TREATMENT FOR SYPHILIS

The best treatment is benzathine penicillin injected in the muscle (page 31). If this is not available or the person has an allergy to penicillin, then use doxycycline by mouth (page 33). Erythromycin (page 34) can be used but it is not as effective and the size of the dose can upset the stomach. Women who are pregnant should get help with treatment in a clinic or hospital.

SIGNS OF CHANCROID

The sores from syphilis and chancroid can look the same but if the sore is painful and bleeds easily, it may be chancroid. Other signs of chancroid are swollen glands in the groin and low fever.

TREATMENT FOR CHANCROID

The best treatment is azithromycin by mouth (page 30). Or use one of these: ceftriaxone injected in the muscle (page 32), or by mouth, ciprofloxacin (page 32), or erythromycin (page 34).

Genital herpes

Genital herpes is a STI caused by a virus. There is no cure for herpes, but treatment can make you feel better.

Genital herpes produces painful sores on the genitals or anus that come and go for months or years. The sores can spread to the mouth during oral sex. (Some mouth sores—called cold sores—are caused by a different type of herpes.)

Herpes can be passed from mother to baby if the mother has herpes sores in the vagina during childbirth. A woman in labor with a herpes sore should give birth in a hospital, usually by caesarean surgery (C-section). Treat the mother during the last month of her pregnancy to prevent sores from passing during birth.

Other infections can easily pass person to person through genital sores, especially hepatitis B, HIV, and other STIs. To prevent spreading or getting these infections, get treatment and avoid sex until the sores heal.

SIGNS

- tingling, itching, or painful feeling of skin on the genitals or, less commonly, on the thighs
- small blisters that burst and form painful, open sores on the genitals

The first time you get herpes sores, they can last for 3 weeks or more. You can have fever, headache, body ache, chills, or swollen lymph nodes in the groin. The next infections are usually not as bad as the first one. Once a person has the virus, sores may reappear many times. To relieve the pain of herpes sores, see How to feel better while you heal from a STI, page 19.

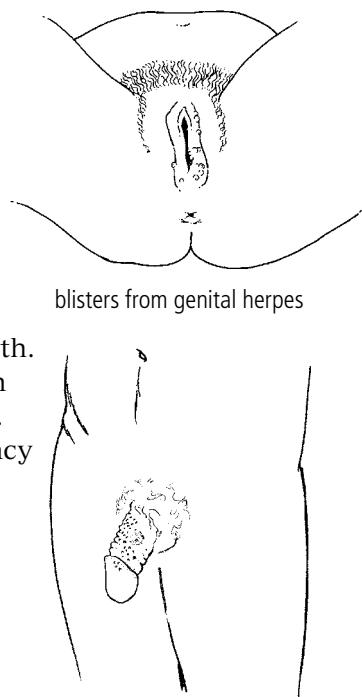
TREATMENT

There is no cure for herpes, but acyclovir (page 40) makes the infection milder and less painful.

PREVENTION

Reduce the spread of herpes by not having sex when you have a sore. Using a condom that covers the sore may reduce spreading. Condoms for women may work even better because they cover more of the genitals.

Always wash your hands with soap and water after touching a sore so your fingers do not spread the infection to other people in your family.

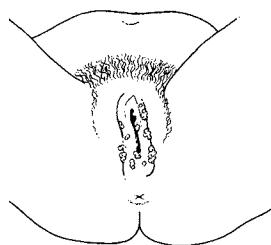


Genital warts

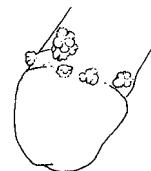
Warts are caused by a virus. Warts on the genitals are softer than warts on other parts of the body and there are usually more of them. It is possible to have warts inside the vagina or inside the tip of the penis and not know it. While warts may eventually go away, usually they continue to get worse and should be treated. Because genital warts can look like an early sign of syphilis, test for syphilis before treating for warts, and if it is syphilis, treat it right away.

Warts grow faster during pregnancy and might bleed during childbirth, which could infect the baby. A pregnant woman with warts should consult a health worker to see if she should give birth in a hospital by caesarean surgery (C-section).

SIGNS

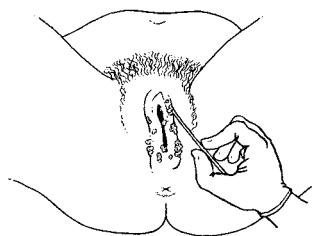


- small, firm, whitish or brownish skin growths that have a rough surface. In women they grow on the lips of the vagina, inside the vagina, or around the anus. In men they usually grow on the penis but also may grow on the scrotum or anus.
- sometimes the warts itch



TREATMENT

Several treatments given once a week are usually necessary. The health worker usually applies the first treatment and may show you how to treat at home or have you return for treatments. Medicines include trichloroacetic acid (TCA), bichloracetic acid (BCA), or podofilox, see pages 40 to 41.



PREVENTION

Wear a condom during sex if you or your partner has genital warts or avoid sex until they are gone. The vaccine that prevents Human papilloma virus (HPV) helps prevent genital warts.

Human papilloma virus (HPV)

There are many kinds of human papilloma virus (HPV). Some types of HPV cause genital warts (page 15). A few types of HPV are more dangerous and can cause cancer of the cervix, cancer of the throat, or cancer in the anus. Most people with HPV have no visible signs of the virus.

Simple screening tests can show if there are abnormal cells on the cervix caused by HPV. But even if tests find HPV, it does not mean there is cancer.

A safe and painless treatment called cryotherapy freezes and kills the abnormal cells on a woman's cervix so they do not develop into cancer. For more information about testing for and treating cancer of the cervix, see the chapter on Cancer, page 12.

A vaccine can protect against the most dangerous types of HPV, including the types that cause most genital warts. A series of vaccinations, given usually between the ages of 9 and 26 years old, prevents getting or spreading HPV infections that can lead to cancers. See the chapter Vaccines Prevent Illness, page 10.



A sample swabbed from the cervix is used to test for HPV.

Hepatitis B and Hepatitis C

Hepatitis is an inflammation of the liver, often caused by a virus. There are many types of hepatitis, but hepatitis B and hepatitis C can be spread through sex or blood. Hepatitis B spreads very easily from one person to another, especially during sex. Hepatitis C is more likely to be spread through blood to blood contact and is less likely to be spread by sex alone. Sex when menstruating or when there is another STI, especially HIV, make it more likely to pass hepatitis C through sex. Hepatitis B and C can lead to permanent damage to the liver (cirrhosis), liver cancer, and even death. Hepatitis C is a major cause of death for people with HIV/AIDS.

Both hepatitis B and C can pass to a baby in the womb.

SIGNS OF HEPATITIS B

- no appetite
- tired and weak feeling
- yellow eyes and sometimes yellow skin (especially the palms of the hands and soles of the feet)
- pain in the belly or nausea
- brown, cola-colored urine, and whitish-colored stools

SIGNS OF HEPATITIS C

Same as the signs of hepatitis B or there might be no signs until many years after getting infected.

Many people do not even know they have it until they are tested.

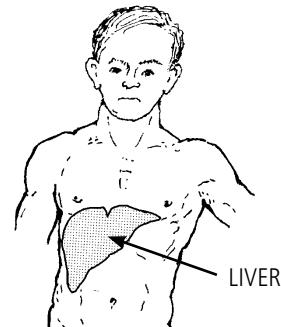
TREATMENT

There are now medicines that treat hepatitis B and C, and can even cure hepatitis C. Getting cured of hepatitis C doesn't prevent you from getting it again if you are exposed. Get tested at your health center to find out what kind of hepatitis you might have and what medicines are available. Even without medicines, you can still feel better and help your liver heal by getting plenty of rest, and drinking juices, broths or vegetable soups. To control nausea and vomiting, sip sodas, ginger drinks, or teas such as chamomile. However, do not drink any alcohol. Even a little alcohol will further harm the liver and make you feel worse. Do not use paracetamol (acetaminophen or Tylenol) or medicines that have it as an ingredient because it can be harmful for an inflamed liver. If needed, take ibuprofen or aspirin instead. There is more information about caring for the liver with hepatitis in the chapter Belly Pain, Diarrhea, and Worms, pages 17 to 19.

PREVENTION

Always use a condom during sex, and do not share needles or other supplies when injecting drugs. Use fresh ink and make sure tools for tattooing, scarring, piercing, or cutting the skin are always sterilized before use because the hepatitis C virus can live on open surfaces or in liquid for 3 weeks. Hepatitis C can even be spread by sharing toothbrushes or razors. Do not share these with other people either.

The vaccine that prevents hepatitis B is a series of 3 injections for infants, usually given along with other vaccinations during the first 6 months of life. If the mother has been vaccinated, a baby will not get the virus during birth. Older children and adults that were not vaccinated as infants can still be vaccinated.



There may be no signs with hepatitis B and hepatitis C for many years but these infections cause serious damage to the liver.

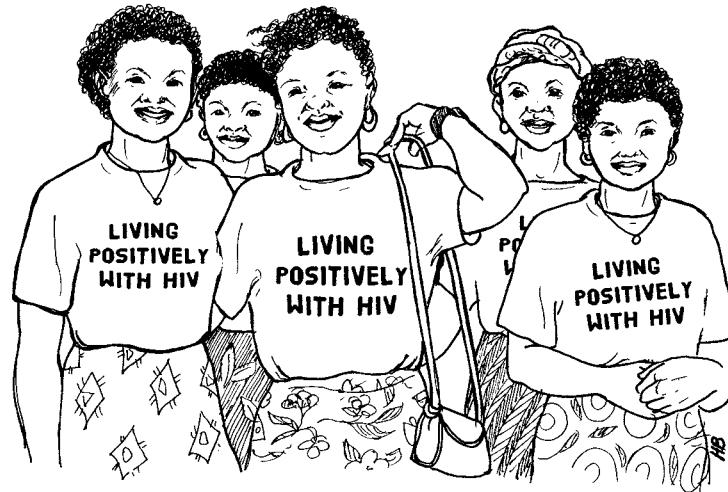
HIV

HIV (Human Immunodeficiency Virus) is a STI that can pass from one person to another through sex, through unclean needles, and by touching infected blood. HIV is not spread through everyday contact such as shaking hands, hugging, or kissing, from living, playing, or eating together, or from sleeping next to each other. Also, it is not spread by food, water, insects, toilet seats, or sharing cups. Although people often think HIV and AIDS are the same, AIDS is an illness that develops later, after a person has been infected with HIV for some time without receiving treatment for it.

HIV does not have any signs at the beginning. Someone who looks and feels completely healthy can have and spread HIV. It may take years for the first signs of illness to appear. The only way to know for sure whether or not you have HIV is to get an HIV test. Tests are available at many health centers at low or no cost.

Treatment for HIV/AIDS (antiretroviral medicines) is now much more widely available and has fewer side effects. Although they are not cured, people taking HIV medicines will not develop AIDS but instead will stay healthy and lead normal and long lives. The medicine limits the virus in their body and this helps prevent HIV passing to other people.

If you think you could have HIV, get tested so you can start treatment as soon as possible. For more information about HIV, see the chapter on HIV and AIDS (in development).



An end to HIV will come when people living with HIV are treated like anyone else and HIV medicines are available to all.

How To Feel Better While You Heal From a STI

The sooner you begin treatment for your STI, the sooner you will feel better. Take all the medicine you were given, even if you start to feel better before you finish the pills. To get relief from the discomfort of a STI before you are cured:

If you have sores or itching of the genitals, sit in a pan of clean, warm water for 15 minutes, 2 or more times a day. If you have a yeast infection, you can add a small amount of lemon juice, vinegar, yogurt (without sugar or flavors), or sour (fermented) milk to the warm water.



If you have painful herpes or other genital sores, try one of these treatments:

- Wrap a piece of ice in a clean cloth. Put it directly on the sore for 20 minutes as soon as you feel the sore developing.
- Make a compress by soaking cloth in cooled black tea and put it on the sore. A compress made from aluminum acetate solution is also soothing.
- Sit in a pan or bath of clean, cool water.
- Mix water and baking soda or corn starch into a paste and put it on the sore area.



If you have genital ulcers and it is painful to pass urine, pour clean water over your genital area while you urinate. Or sit in a pan of cool water while you urinate.

If you have pain, take a pain medicine such as aspirin, ibuprofen, or paracetamol (acetaminophen).



Wear loose underclothes and pants. This lets air circulate around your genitals which will help you heal.

Wash your underclothes once a day and dry them in the sun. This kills germs that can cause infection.

Do not have sex until you feel better. If you do have sex, use a condom with lubrication.

Pregnancy and STIs

When a pregnant woman has a STI, her baby can be exposed to the infection through the mother's blood during pregnancy, during birth when they pass through the vagina, or in breastmilk.

An untreated or uncontrolled STI can harm both the woman and her baby. Babies can be born too early or too small, and they can be born sick or get sick later on. Tests for STI let you know that either you have nothing to worry about or will help you get the right treatment during pregnancy or at birth. Treatment can cure mother and child, and treat the woman's partner too.



Gonorrhea and chlamydia

Gonorrhea or chlamydia can pass to the baby during birth and can cause eye infections, blindness, or serious lung problems. To prevent eye infections and blindness, put erythromycin ointment in the baby's eyes right after birth (see Newborns Babies and Breastfeeding, page 27).

Syphilis

Syphilis can pass to the baby in the womb, causing it to be born too early, deformed, or dead. Get tested and treatment during pregnancy.

Herpes

Herpes can pass to a baby during birth if the mother has sores on the genitals. If you are newly diagnosed with herpes or have sores, it is best to give birth in a hospital. They might deliver the baby through an operation (C-section) and treat the baby after birth.

Warts

Warts will not usually pass to a baby, but they can bother you during pregnancy. Treat warts (see pages 40 and 41) or wait until after birth to treat them. Because warts may bleed during birth, consult a health worker about your options for giving birth in a hospital.



Hepatitis B

A pregnant woman can pass her hepatitis B to her baby. The baby will need the HepB vaccine right after birth and other treatment to prevent hepatitis B infection.

HIV

Testing for HIV when pregnant means you can get medicines to prevent passing it to the baby. HIV medicines will protect the mother and the baby.

Prevent Infections From Sex

Sexually transmitted infections (STIs) are passed from person to person during sex. This happens when there is contact with the skin or fluids from the vagina, penis, anus, or mouth. Anyone can get a STI, but STIs are less likely to spread when people practice safer sex, treat and cure infections, and work to change the conditions that have allowed STIs to become such a serious problem.

You are **more likely** to get an STI if:

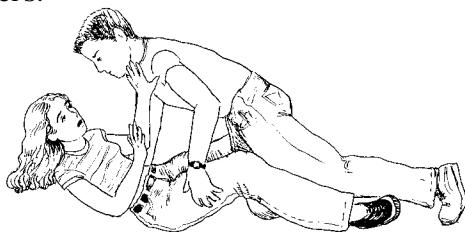
- your partner has signs of an STI. They can easily pass the STI to you, or could have passed it already, even if you have no signs.
- you have more than one partner.
- you have a new partner who may have an STI from their previous partner.
- your partner has other partners who may have STIs.
- you and your partner do not use condoms.
- you have sex with someone who shares drug injection needles, or if you share needles to inject drugs.

Test often if getting a STI is possible. Testing for STIs every 6 to 12 months is a good idea for both women and men who have unprotected sex with more than one partner, with a partner who has sex with others, or because one person injects drugs.

Women face more risks

Women face more obstacles to protecting themselves from STIs and getting adequate treatment, especially in communities where:

- child marriage is common.
- women are denied sexual health services and information.
- men are expected to have many partners.
- education is denied to girls and women.
- no one talks about sexual abuse or how to stop it.
- women are in situations where it is difficult or dangerous to refuse sex.
- sex work is criminalized.
- sex and sexuality are considered shameful, even though they are normal, and no one talks about sex openly.

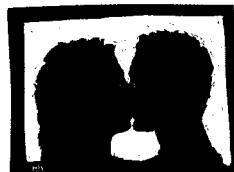


Safer sex

What is safer sex and how can you make sex more safe for you? This may not be easy but often there is something you can do. Practicing safer sex can prevent you from getting or spreading a STI.

Here are some ways to have safer sex:

- **Do not have sex.** This is also called abstinence. If you do not have sex, you will not get a STI. Everyone can do this for a short while, but for most people this choice is not what they want for the rest of their lives.
- **Have sex with only one partner.** Choose a person you know for certain has sex only with you. Get tested together to make sure neither of you has a STI from a previous partner. Being faithful to each other and avoiding other ways of getting a STI will protect you both.
- **Do not have sex with someone who has signs of a STI.** Help them get tested and treated before you have sex with them. Unless the person gets tested, it is hard to know who has a STI and who does not. STIs can spread even if a person has no signs.
- **Have sex with no penetration of the vagina or anus.** There are many ways to give and get pleasure without penetration, including kissing, rubbing, or massaging different parts of the body, and touching each other's genitals with the hands (mutual masturbation) or mouth (oral sex).
- **Use condoms every time.** Put on a latex condom before your partner's genitals touch yours, every time, even with a long-term partner. Female condoms protect best against STIs because they cover more of the genital area. If you are trying to get pregnant, only have sexual intercourse without a condom during your fertile time. Use male or female condoms (or dental dams or plastic wrap) during oral sex. Also use a condom with sex toys that more than one person has shared.



Kissing is safe



Touching is safe



Oral sex is less safe—
but safer with a condom



Vaginal sex is risky—
but safer with a condom



Anal sex is very risky—
but safer with a condom

Talking about sex with a partner

Convincing your partner to have sex in ways that reduce STIs can be hard. Most people are taught not to talk about sex, even with the people they have sex with. Here are some suggestions:

- **Focus on safety.** If you want safer sex, your partner may think you do not trust them. But the issue is safety, not trust, because a person can have a STI without knowing it. Safer sex is a good idea for every couple, even if both partners have sex only with each other.
- **Focus on preventing unwanted pregnancy.** If you don't want to have a child now, you and your partner can talk about how condoms prevent STIs and also prevent pregnancy.
- **Practice talking with a friend.** Ask a friend to pretend to be your partner and then practice what you want to say. Think of how your partner might respond, and practice for each possibility. It is likely you both will feel nervous talking about sex, so think of ways to make the conversation easier for each of you.
- **Do not wait until you are about to have sex to talk about it!** Choose a time when you are both relaxed and feeling good about each other. If you have stopped having sex because you have a new baby, or were being treated for a STI, try to talk before you have sex again. If you and your partner live far apart or must travel often, talk about how to protect your sexual health before you get back together.
- **Learn more about risks and how to have safer sex.** People who do not know much about STIs, how they are spread, and their long-term health effects, cannot understand the risks involved in unsafe sex. Information can help you convince them of the need to practice safer sex.



Treatment as prevention

Most STIs can be cured with treatment, especially when treatment starts as soon as possible. Having one STI makes getting infected with HIV or other STIs more likely, but after treatment, people usually don't spread STIs to others.

Treat right away. Health workers know their community and whether the person who has come to get help for a STI is likely to return for more care. That will help them decide which treatment or treatments to start with.

Treat partners. When a person finds out that he or she has a STI, other people they had sex with will need to get tested and treated. If it is difficult for you to speak with former partners, health workers and STI programs can help contact the people so they get tested. If you can safely speak with former partners, insist that they avoid all sexual contact until they are tested, treated, and cured.

Treating pregnant women quickly prevents passing the infection and the problems it can cause to the baby (see page 20).

Preventive medicines for some STIs

Post Exposure Prophylaxis (PEP) is a way to use the medicines used to treat HIV, called antiretroviral treatment, to prevent a person from getting an HIV infection. When a person is exposed to HIV (for example, from rape or sex without a condom), taking HIV medicines as soon as possible within 3 days can prevent getting HIV. When HIV medicines are taken daily by people without HIV to prevent getting HIV, this is called Pre-Exposure Prophylaxis (PrEP). See the chapter on HIV and AIDS (in development) for more information.

A full series of hepatitis B vaccine and hepatitis B immune globulin (HBIG), started as soon as possible after an exposure, can prevent hepatitis B infection.

STI screening, testing, and treatment programs belong everywhere

When health centers provide STI testing and treatment as part of family planning services, pregnancy check-ups, and other health services, testing and treatment become more accessible to everyone. Everyone, especially young people, need accessible, affordable, and respectful services. Permanent school clinics or special events to offer testing and counseling at street fairs, bars, dance halls, or anywhere where people can reach people who do not regularly get health care. Wherever people already go is a good place to bring STI information and services.

How health workers make a difference in STI prevention and care

Show how talking about sex is normal. Everyone worries if something seems wrong with their genitals. And people often are fearful to seek help, especially if the problem seems related to having sex. You can show compassion to people in this situation. Treat them well and they will feel relieved and not ashamed that they came to you. Your positive attitude helps not only that person but also others who might not seek testing or treatment for fear of being judged.

Health information is private. When a person comes to you for help, keep what they told you private. If you don't, they may not look to the health system for treatment again.

Criticizing does not cure. Honest answers to questions, along with needed tests and medicines are the best way to help. If you cannot treat the STI, help find low-cost care nearby.

Respect people's sexuality.

Remember that the person you help could be gay, lesbian, or bisexual, even if they don't tell you this. You can find words for sexual partners that could include either a man or a woman. Also be welcoming to transgender people and respect what they tell you about being a man, a woman, or having another name for their gender. During a genital exam, do not show surprise if the person does not have the body parts you associate with their gender. Focus on how to treat the person's condition, and only talk about their gender if they want to. Everyone's health is better when you can help anyone with a health problem.



Helping young people. STIs are a serious and growing problem for young people, especially young women. Young people are more likely to talk to others their own age who share their values, plans, and choices. Many times young people cannot rely on their families for support. You can support young people by providing gathering places that are safe, where no one will judge them, and where they can find correct information about health, sex, sexual health services, and their other concerns.

Everyone has sex. Your job as a health worker is not to judge or make decisions for people but rather to treat them now and support their ability to make safer, healthier choices for themselves.

To make services more helpful for young people:

- Make your services available where youth already go, such as schools, markets, and community centers.
- Reserve “youth only” hours in a clinic in the late afternoon, evening, or weekends.
- Reassure young people that health workers will treat them with respect and will not share their information with anyone else.
- Train young people as peer counselors.
- Make services and condoms free or as low-cost as possible.

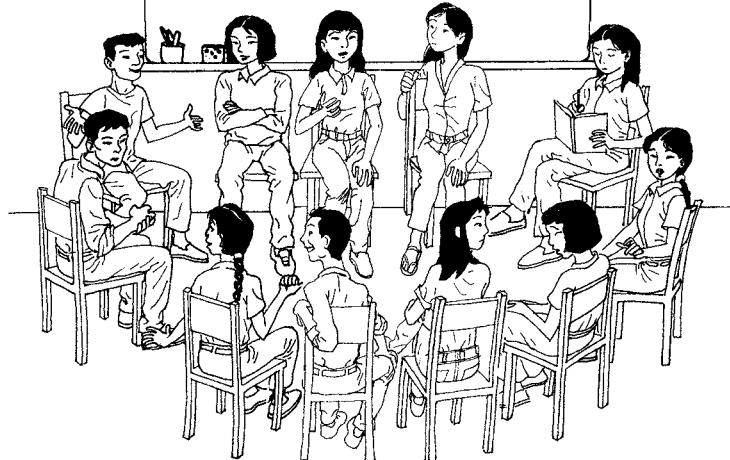


Health Worker Training

Discuss:

5 ways you make people feel welcome.

5 ways to talk without criticizing the person.



End shame and stigma about STIs

Share information about condoms and how to use them. Some government or non-governmental organizations provide free condoms to people who need them. See the chapter on Family Planning (p. 8) for more about how to use condoms for men and women.

Work with your community. Talk and teach about sex. People are more likely to prevent STIs when they can talk about sex openly and have access to information, services, and condoms as well as testing and treatment for STIs. Hesperian's *Health Actions for Women* has many activities and ideas to start conversations and solve problems related to sexual health.



Where people are taught that sex is shameful, it is more difficult to seek help for a STI. If couples with same sex relationships (between 2 men, or between 2 women) are discriminated against or hidden, people will have a harder time talking with their partners about safer sex, testing, or seeing a health worker.

Stigma or discrimination against sex workers, people who inject drugs, have dark skin, or are members of a “lower” class or caste, make it that much harder for the community to prevent STIs.

Health centers can help lessen the stigma of having a STI by providing testing and treatment as a routine part of health care for all adults and young people. For people to be comfortable with STI testing, they need to know they will be treated with respect and privacy.

In the long run, STIs can best be prevented by fighting for fairer social and economic conditions. When families do not need to separate to find work, when people need not trade their bodies for food, shelter or money, and when young people have access to education and a future, there will be fewer cases of sexually transmitted infections.

Sexually Transmitted Infections: Medicines

Most STIs can be successfully treated with antibiotics. Anti-fungal medicines and medicines to relieve pain are also used. Although not curable, HIV and herpes can be controlled with medicines that will help you feel better and stay healthy. To learn about medicines for HIV, see the chapter HIV and AIDS (in development).

STI medicines only work when you take all the medicine as recommended. Even if your signs go away, you will not be cured until all the medicine has time to work. If the signs do not begin to go away by 3 days after taking the medicines, see a health worker. Pain or vaginal discharge could also be caused by another problem, or you may need a different medicine.

Note: All doses given are for adults and children over 12 years old.

Antibiotics

Antibiotic medicines fight infection from bacteria. Different antibiotics will fight different bacteria.

Antibiotics that share the same chemical make-up are said to be from the same family. It is important to know about the families of antibiotics, for two reasons:

1. Antibiotics from the same family can often treat the same problems. This means you can sometimes use a different medicine from the same family.
2. If you are allergic to an antibiotic, you will also be allergic to the other members of the same family of antibiotics. This means you will have to take not just a different medicine, but a medicine from a different family instead.

Antibiotics must be given for their full course. Stopping early, even if you feel better, can make the infection return in a form that is even harder to stop. However, if there are serious side effects from the antibiotic, like frequent diarrhea or an itchy rash that spreads throughout the body quickly, you may need to stop using the antibiotic. For help deciding, see a health worker right away.

Amoxicillin

Amoxicillin is an antibiotic of the penicillin family used to treat STIs and other infections. Because of drug resistance, it is less useful than previously.

Side effects



Amoxicillin may cause diarrhea, rash, nausea, or vomiting. It may cause yeast infection in women or diaper rash in children.

Important !

Do not use if allergic to medicines of the penicillin family.

If you do not start to get better in 3 days, you may need a different medicine.

How to use



Take with food.

For chlamydia:

- Give 500 mg by mouth 3 times a day for 7 days. Do not use amoxicillin to treat chlamydia unless neither azithromycin or doxycycline is available.

For pelvic inflammatory disease (PID):

- Give 500 mg by mouth 3 times a day for 14 days (also give ceftriaxone or spectinomycin to treat PID, see page 43). Do not use amoxicillin to treat PID unless none of the following is available: azithromycin, doxycycline, or erythromycin.

Azithromycin

Azithromycin is an antibiotic of the macrolide family used to treat many STIs. It is safe during pregnancy and breastfeeding.

Side effects



Azithromycin can cause diarrhea, nausea, vomiting, and abdominal pain.

Important !

Do not use this antibiotic if you have allergies to erythromycin or other antibiotics of the macrolide family.

How to use



For gonorrhea, chlamydia, or chancroid:

- Give 1 gram (1000 mg) by mouth 1 time only. (To treat gonorrhea, also give ceftriaxone or another medicine, see page 42.)

For pelvic inflammatory disease (PID):

- Give 1 gram (1000 mg) by mouth as a single dose. Give a second dose 1 week later. (To treat PID, also give ceftriaxone or spectinomycin , see page 43.)

Benzathine penicillin

Benzathine penicillin is a long-acting antibiotic of the penicillin family used to treat syphilis. It is always given as an injection into muscle.

Important

Do not take if you are allergic to medicines of the penicillin family. Have epinephrine on hand whenever you inject penicillin. Watch for allergic reactions and allergic shock which could start within 30 minutes.

How to use

Can be painful to inject. Mix with 1% lidocaine if you know how.

For syphilis:

- If there is a sore or body rash or another sign of syphilis in the early stages, inject 2.4 million Units into muscle 1 time only. A person who had a test result showing no syphilis and then a test showing syphilis less than a year later also needs this dose.

If it is likely that the person has had syphilis for more than a year or has mental or other problems that come after many years of syphilis, a single dose will not be enough. When a test shows syphilis and it is possible that infection was at least 2 years ago or more, inject 2.4 million Units into muscle once a week for 3 weeks. Help the person get the right tests and treatment from an experienced health worker.

Cefixime

Cefixime is an antibiotic of the cephalosporin family used to treat many infections, including gonorrhea.

Side effects

Cefixime can cause upset stomach, diarrhea, and headaches.

Important

Do not take if you are allergic to medicines of the cephalosporin family. Watch for allergic reaction. Always be prepared to treat for allergic reaction and shock when injecting antibiotics.

People who have liver problems should be careful when taking cefixime.

How to use

For gonorrhea:

- Give 400 mg by mouth 1 time only. (To treat gonorrhea, also give azithromycin or another medicine, see page 42.)

Ceftriaxone

Ceftriaxone is an antibiotic of the cephalosporin family that is injected into muscle or vein. It is used for many infections, including gonorrhea and pelvic inflammatory disease (PID).

Important !

Do not take if you are allergic to medicines of the cephalosporin family. Watch for allergic reaction. Always be prepared to treat for allergic reaction and shock when injecting antibiotics.

How to use

Can be painful to inject. Mix with 1% lidocaine if you know how.

For gonorrhea in adults:

- Inject 250 mg into muscle 1 time only. (To treat gonorrhea, also give azithromycin or another medicine, see page 42.)

For pelvic inflammatory disease (PID):

- Inject 250 mg into muscle 1 time only. (To treat PID, also give doxycycline or another medicine, see page 43).

For chancroid:

- Inject 250 mg into muscle 1 time only

Ciprofloxacin

Ciprofloxacin is an antibiotic of the quinolone family that is used for different infections including chancroid.

Side effects

Ciprofloxacin can cause nausea, diarrhea, vomiting, or headache.

Important !

Do not use if you are pregnant, breastfeeding or younger than 16 years old.

Do not take with dairy products.

How to use

Drink a glass of water after taking this medicine.

For chancroid:

- Give 500 mg by mouth, 2 times a day for 3 days. Give for 7 days if the person also has HIV

Clindamycin

Clindamycin is an antibiotic used for different infections including bacterial vaginosis.

Side effects



Nausea, vomiting, and diarrhea can happen within a few weeks of using clindamycin. If you get a skin rash, stop using it and see your health worker.

Important

If you are breastfeeding and this medicine gives your baby diarrhea, stop using it.

Using for more than 30 days can lead to thrush and yeast infections, and harm people with kidney or liver problems. The vaginal cream can weaken condoms for up to 3 days after use.

How to use



It comes in both capsules to take by mouth and as a cream.

For bacterial vaginosis:

- Give 300 mg by mouth, 2 times a day for 7 days
OR
Insert 5 g of 2% cream (1 full applicator) high in the vagina each night for 7 days

Doxycycline

Doxycycline is an antibiotic of the tetracycline family used to treat many different STIs. It can be used in place of tetracycline and is easier to use because it is taken fewer times each day.

Side effects



Doxycycline can cause diarrhea or upset stomach. Some people get a rash after staying a long time in the sun.

Important

Do not take if allergic to antibiotics of the tetracycline family.

Do not take doxycycline if pregnant and try to avoid if breastfeeding.

How to use



Avoid milk, iron pills, and antacids for 2 hours before or after taking.

Do not take just before lying down. Sit up while taking pills and drink lots of water to prevent the irritation that swallowing this medicine can cause.

For gonorrhea or chlamydia:

- Give 100 mg by mouth, 2 times a day for 7 days (this will treat chlamydia but to also treat gonorrhea an additional medicine is needed, see page 42)

For early syphilis:

- Give 100 mg by mouth, 2 times a day for 14 days. It is better to use benzathine penicillin for syphilis unless it is not available or the person is allergic to penicillin.

For pelvic inflammatory disease (PID):

- Give 100 mg by mouth, 2 times a day for 14 days. (To treat PID, also give ceftriaxone or spectinomycin, see page 43.)

Erythromycin

Erythromycin is an antibiotic of the macrolide family used to treat many infections, including some STIs. It is safe to use during pregnancy and is widely available, but for most STIs it is no longer as effective as other antibiotics.

Side effects 

Erythromycin may upset stomach or cause nausea, vomiting, and diarrhea.

Important 

Do not use if you are allergic to antibiotics of the macrolide family.

How to use 

Erythromycin works best when taken 1 hour before or 2 hours after a meal. If this upsets your stomach too much, take with a little food. Do not break up tablets because they are coated to protect it against strong stomach juices before it can begin to work in the intestine.

For chlamydia:

- Give 500 mg by mouth, 4 times a day for 7 days

For chancroid:

- Give 500 mg by mouth, 4 times a day for 7 days

For syphilis:

- Give 500 mg by mouth, 4 times a day for 15 days. It is better to use benzathine penicillin for syphilis unless it is not available or the person is allergic to penicillin. Or, if available, doxycycline will work better for syphilis than erythromycin.

For pelvic inflammatory disease (PID):

- Give 500 mg by mouth 4 times a day for 14 days. (To treat PID, also give ceftriaxone or spectinomycin, see page 43.)

Metronidazole

Metronidazole is an antibiotic used to treat bacterial vaginosis (BV), trichomonas, or PID.

Side effects



Metronidazole can cause a metallic taste in mouth, dark urine, upset stomach or nausea, and headaches.

Important

Do not take this medicine if you have jaundice (yellow eyes) or other liver problems.

Stop taking it if you feel numb.

Do not drink alcohol, not even 1 beer, while you are taking metronidazole. It will make you feel very nauseous.

How to use



It comes as inserts for the vagina and tablets to take by mouth.

For bacterial vaginosis or trichomonas:

- Give 2 grams (2000 mg) by mouth 1 time only (not recommended for pregnant women)
OR
Give 400 to 500 mg by mouth, 2 times a day for 7 days
OR
Insert one 500 mg insert high in the vagina, every night for 7 nights

For pelvic inflammatory disease (PID):

- Give 400 to 500 mg by mouth, 3 times a day for 14 days. (To treat PID, also give 2 other medicines, see page 43.)

Spectinomycin

Spectinomycin is an aminocyclitol antibiotic used to treat PID and gonorrhea, but it does not work for gonorrhea of the throat. It is especially useful for people allergic to penicillin and cephalosporin antibiotics.

Side effects



It can cause chills, pain or redness at injection site, dizziness, and nausea.

How to use



It comes in vials for injection of 2 g.

For gonorrhea or pelvic inflammatory disease (PID):

- Inject 2 g (2000 mg) into muscle 1 time only. (To treat PID, also give doxycycline or another medicine, see page 43.)

Tetracycline

Tetracycline is an antibiotic of the tetracycline family, used to treat many infections including chlamydia. Doxycycline works for the same infections, may cost less, and is easier to take.

Side effects



If you spend time in the sun, it can cause skin rashes. It may cause diarrhea or upset stomach.

Important !

Do not take if allergic to antibiotics of the tetracycline family.

Do not use tetracycline if you are pregnant or breastfeeding.

How to use



Avoid milk, iron pills, and antacids for 2 hours before or after taking.

For chlamydia:

- Give 500 mg by mouth, 4 times a day for 7 days

For newborn eye-care to prevent and treat gonorrhea or chlamydia at birth:

- Apply 1% ointment in each eye at birth, 1 time only

Tinidazole

Tinidazole is an antibiotic, similar to metronidazole, used to treat some vaginal infections.

Side effects

Tinidazole can cause a metallic taste in mouth, upset stomach or nausea, or headache.

Important

Do not take this medicine if pregnant.

Do not drink alcohol, not even one beer, while you are taking tinidazole or for 3 days after. It will make you feel very nauseous.

How to use

Drink a glass of water after taking this medicine.

For bacterial vaginosis or trichomonas:

- Give 2 grams (2000 mg) by mouth 1 time only, but not if you are pregnant
OR
Give 500 mg by mouth 2 times a day for 5 days

With trichomonas, also treat the person's sexual partner but this is not necessary with bacterial vaginosis.

Anti-fungal medicines

Clotrimazole

Clotrimazole is an anti-fungal medicine used to treat yeast and other fungus infections in the vagina, penis, mouth, and skin.

Side effects

Clotrimazole may irritate the skin. Stop using if you get a rash.

How to use



It comes as inserts for the vagina and as cream.

For yeast infections of the vagina

- If using 1% cream: Insert 5 g of cream high in the vagina every night for 7 nights
OR
- If using 2% cream: Insert 5 g of cream high in the vagina every night for 3 nights
OR
- If using inserts, put one high in the vagina every night, including during menstruation. Use 100 mg inserts for 7 nights, 200 mg inserts for 3 nights, or a 500 mg insert for 1 night only.

For yeast infections of the penis:

- Apply 1% cream to the affected skin of the penis, every night for 7 nights

Gentian violet (GV, methylrosanilinium chloride)

Gentian violet is a disinfectant used to help fight infections of the vagina, mouth, and skin.

Important



Gentian violet turns everything purple. It fades off the skin in a few days but can permanently stain clothing.

How to use



For yeast infections of the vagina:

- Soak clean cotton with 1% liquid and place high in the vagina overnight for 3 nights. Be sure to remove the cotton every morning. If the infection does not start to heal within a couple of days, try something else.

For thrush in the mouth of baby born from a woman who has a yeast infection:

- Use liquid or tincture at 0.5% and paint it in the mouth 2 or 3 times a day for 3 days. If the infection does not start to heal within a couple of days, try something else.

Miconazole

Miconazole is an anti-fungal medicine used to treat yeast and other fungus infections of the vagina, penis, and skin.

Side effects



Miconazole may irritate the skin. Stop using if you get a rash.

How to use



It comes as inserts for the vagina and as cream.

For yeast infections of the vagina:

- If using 2% cream: Insert 5 g in the vagina every night for 7 days
OR
If using inserts: put one high in the vagina every night, including during menstruation. Use 100 mg inserts for 7 days, or 200 mg inserts for 3 days.

For yeast infection of the penis:

- Apply 2% cream to the affected skin of the penis, 2 times a day for 7 to 14 days

Nystatin

Nystatin is an anti-fungal medicine used to treat yeast infections of the vagina, penis, mouth, and skin.

Side effects



Nystatin may irritate the skin. Stop using if you get a rash.

How to use



It comes as inserts for the vagina and as cream.

For yeast infections of the vagina:

- If using cream: Insert cream inside the vagina twice daily for 10 to 14 days.
OR
If using inserts: Moisten first and then put 100,000 IU insert high in the vagina, each night for 14 nights, including during menstruation.

For yeast infection of the penis:

- Apply cream to the affected skin of the penis, 2 times a day for 7 to 14 days

Antiviral medicines

Acyclovir

Acyclovir is a medicine used to fight herpes viruses. Acyclovir does not cure herpes, but it makes the sores less painful and keeps them from spreading.

Side effects

Acyclovir may sometimes cause headache, dizziness, nausea, and vomiting.

Important

Do not take if you have kidney problems.

How to use

Start acyclovir as soon as signs start to appear.

For first time infection of genital herpes:

- Give 200 mg by mouth, 5 times a day for 7 days
OR
Give 400 mg by mouth, 3 times a day for 7 days

If you have had herpes infection before:

- Give 200 mg by mouth, 5 times a day for 5 days
OR
Give 400 mg by mouth, 3 times a day for 5 days

If you have 6 or more outbreaks in a year, talk with an experienced health worker to see if taking acyclovir for a longer period will help.

Medicines for genital warts

Podofilox

Podofilox comes as a liquid to treat warts around the genitals and as a gel to treat warts around the anus or the genitals. Don't confuse it with podophyllin, also used for genital warts, but more harmful if not used correctly. Podofilox is safer to use.

The health worker can apply it for the first time in the clinic to show how to do it. The person may need help using podofilox if the warts are hard to see or to reach. Apply the liquid with a cotton swab or the gel with a finger. Wash hands after use. Wait until it dries before putting clothes on.

Side effects



Podoftlox can irritate skin, causing it to thin, break, and bleed.

Important



Do not use this if you are pregnant or breastfeeding.

If severe skin irritation occurs, do not use it again.

How to use



For genital warts:

- Using liquid or gel, treat the warts twice a day (morning and evening) for 3 days. Then stop using for 4 days. Repeat the 3 days of treatment and 4 days without treatment up to 4 weeks total. Stop when the warts are gone. If the warts remain after 4 weeks, do not keep using podoftlox. See a health worker for a different treatment.

Trichloroacetic acid and bichloroacetic acid

Trichloroacetic acid or bichloroacetic acid are acids applied directly on genital warts to shrink them. An experienced health worker can do this to avoid serious burns.

Side effects



Trichloroacetic acid and bichloroacetic acid will hurt or destroy normal skin when they touch it.

Important



Use very carefully. It will burn and can cause a scar.

How to use



They come as liquids in strengths of 10% to 35%.

For genital warts:

- First protect the area around the wart with petroleum gel. Then use a cotton swab or clean cloth rolled to a fine point to apply small amounts of trichloroacetic acid or bichloroacetic acid only to warts bit by bit until they turn white. Apply once a week for 1 to 3 weeks, as needed.

It will hurt for 15 to 30 minutes. If it touches healthy skin, wash it off right away with soap and water.

Repeat the treatment after one week. If the treatment is working, a painful sore will appear where the wart used to be. Stop treatment. If there is too much irritation, wait longer before the next treatment. Sores should heal within a week or two. Keep sores clean and dry and watch for infection.

Medicine combinations to treat gonorrhea and chlamydia

Gonorrhea and chlamydia are 2 STIs that often occur at the same time. Treat with 2 different medicines. Choose 1 medicine from each section below. For each section, the best choices are listed first and in order of next best after that. For example, the best combination is ceftriaxone and azithromycin.

Also treat the person's partner with the same medicines.

Medicine	How much to give	How to use
ceftriaxone	250 mg	inject into muscle 1 time only
or cefixime	400 mg	by mouth 1 time only
or spectinomycin	2 grams (2000 mg)	inject into muscle 1 time only
AND		
azithromycin	1 gram (1000 mg)	by mouth 1 time only
or doxycycline <i>(do not use doxycycline if you are pregnant and avoid using it if you are breastfeeding)</i>	100 mg	by mouth 2 times a day for 7 days
or erythromycin	500 mg	by mouth 4 times a day for 7 days
or tetracycline <i>(do not use tetracycline if you are pregnant or breastfeeding)</i>	500 mg	by mouth 4 times a day for 7 days
or amoxicillin <i>(amoxicillin can be used if you are pregnant and azithromycin and erythromycin are not available)</i>	500 mg	by mouth 3 times a day for 7 days

Medicine combinations to treat Pelvic Infection (PID)

If the signs are for Pelvic Inflammatory Disease (PID, see page 11) and are severe or the woman is pregnant, she will need medicines given in the vein (IV).

If the signs are beginning and not yet severe, use medicines by mouth to treat. This infection is usually caused by a mix of germs, so at least 2 kinds of medicines are needed to cure it. Choose 1 medicine from each of the first two boxes below and, if available, also give metronidazole (box 3). The best choices in each box are listed in order. For example, the best combination is to give ceftriaxone, doxycycline, and metronidazole. After 2 days, if the medicines do not seem to be working, get medical help.

Also treat the person's partner using the medicines for gonorrhea and chlamydia (see page 42).

Medicine for infections from gonorrhea. Use one.	How much to give	How to use
ceftriaxone	250 mg	inject into muscle as a single dose
or spectinomycin	2 grams (2000 mg)	inject into muscle as a single dose
AND		
Medicines for infections from chlamydia. Use one.	How much to give	How to use
doxycycline <i>(do not use doxycycline if pregnant and avoid using it if you are breastfeeding)</i>	100 mg	by mouth, 2 times a day for 14 days
or azithromycin <i>(take azithromycin with food, safe during pregnancy)</i>	1 gram (1000 mg)	by mouth as a single dose, and a second dose 1 week later
or erythromycin <i>(safe during pregnancy)</i>	500 mg	by mouth, 4 times a day for 14 days
or amoxicillin <i>(amoxicillin can be used if you are pregnant and azithromycin and erythromycin are not available)</i>	500 mg	by mouth, 3 times a day for 14 days
AND		
Medicine for other infections (use if it is available).	How much to give	How to use
metronidazole	400 to 500 mg	by mouth, 3 times a day for 14 days
IMPORTANT! Do not drink alcohol while you are taking metronidazole.		

Medicine combinations to treat both syphilis and chancroid

It is not always possible to tell the difference between chancroid and syphilis. If you are not sure whether the person has one or the other or both, it is best to treat both infections at the same time. Choose 1 medicine from each box. For each section, the best choices are listed first and in order of next best after that. For example, the best combination is benzathine penicillin and azithromycin. If using erythromycin to treat syphilis, don't use azithromycin or erythromycin for chancroid.

Medicine to treat syphilis. Use one.	How much to give	How to use
benzathine penicillin <i>(can be used if pregnant)</i>	2.4 million Units	inject into muscle, one time only
or doxycycline <i>(do not use if pregnant and avoid use if breastfeeding)</i>	100 mg	by mouth, 2 times a day for 14 days
or erythromycin <i>(only use this if you are pregnant or breastfeeding and allergic to penicillin. It will treat syphilis in the mother, but after the birth the baby will need additional treatment)</i>	500 mg	by mouth, 4 times a day for 15 days
AND		
Medicine to treat chancroid. Use one.	How much to give	How to use
azithromycin	1 gram (1000 mg)	by mouth, one time only
or ceftriaxone	250 mg	inject into muscle, one time only
or ciprofloxacin <i>(do not use if pregnant or breastfeeding or under age 16)</i>	500 mg	by mouth, 2 times a day for 3 days
or erythromycin	500 mg	by mouth, 4 times a day for 7 days

Cancer

What is Cancer?

Our bodies, and all living things, are made of cells. Cells are tiny units of different types that, working together, make a living thing. Each cell is also alive. It divides to make new cells, and each one eventually dies.

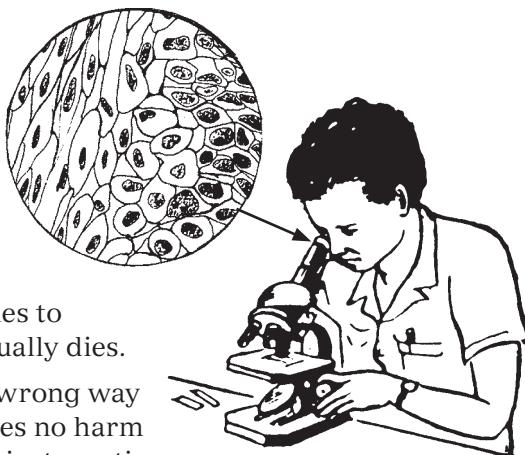
Sometimes a new cell forms the wrong way and is not healthy. Usually this causes no harm to the body as a whole, because it is just one tiny cell of millions, and it soon dies. But sometimes a damaged cell divides and creates more and more cells just like it. These damaged cells reproduce and form an unhealthy mass or growth in the body called a tumor.

A tumor can be benign, meaning it does not spread or cause damage. Or it can be malignant, meaning it keeps growing and invades other parts of the body. This is cancer. Depending on the types of cells and where they grow, cancer can be slow-growing and harmless, or can cause severe sickness or death.

Cancer is not one disease. Every type of cancer is different. Some can be prevented, and some are easily treated and even cured. Others are deadly.

If you are worried you might have cancer

Thinking you might have cancer can be very worrisome. Do not delay in seeking help for a sign that could mean cancer, but stay calm and remember that many cancer signs are also signs of other, less serious problems.



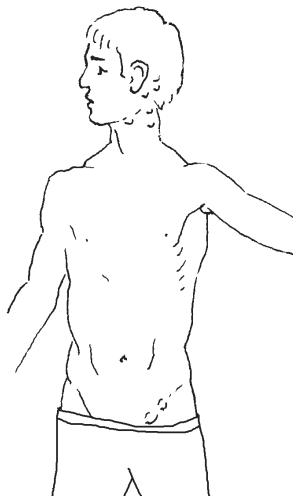
Cells are so small, you can only see them with a microscope.



For most cancers, the only sure way to know you have it is with a surgical test called a biopsy which is available at some clinics and hospitals. During a biopsy, a health worker removes a very small piece of the body where cancer is suspected and examines it under a microscope to look for abnormal cells.

If a new lump is growing or causing pain, under your skin or anywhere in your body, it should be examined. This is especially important if it is firm and does not move. A lump could be an infection or a bump that is harmless and will go away by itself, but it also could be a sign of cancer, one that is possible to find early and treat. Ask a health worker about a lump that:

- grows in size
- is new and does not go away in a few weeks
- causes pain
- feels hard



The body fights infection through the lymph system, but lymph glands can also be a place where cancer develops. See a health worker about swelling or lumps that do not go away, especially:

- behind the ear
- on the neck or under the chin
- in the armpits and groin

If a person has a lump for many years that does not grow or change, it probably is not cancer.

There are signs common to many cancers, but not all cancers cause these signs. And all these signs can be caused by chronic health problems that are not cancers. In this chapter, read about the signs specific to each kind of cancer.

SIGNS COMMON TO MANY CANCERS

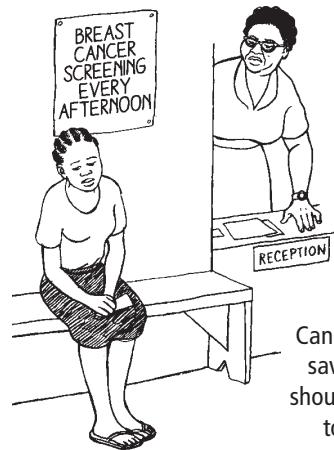
In general, these signs happen when cancer is advanced, so they are not good signs to rely on for finding cancers early.

- Weight loss
- Feeling tired all the time (fatigue)
- Severe pain that does not get better

If you have cancer, find a health worker who can help you understand what options are available for treatment or care and where to go. Bring another person with you during appointments to help you ask questions and remember information.

Screening programs

Some cancers can be found early, before they cause any signs, through screening programs which test people at risk for certain types of cancer. Screening programs are most common for cervical cancer (page 12) and breast cancer (page 16) because it is possible to detect these cancers before they cause harm, and these cancers can often be successfully treated when found early.



Cancer screenings save lives. They should be available to everyone.

*The earlier a cancer is found,
the greater the chance for successful treatment.*

Who gets cancer?

We know a lot about what causes cancer, but not always why some people get cancer and others do not. Anyone can get cancer and chances increase as you get older. For only a few types of cancer (especially breast cancer), having one person in the family with that cancer makes it more likely that another person will too. But most cancers do not “run in the family.”

We do know:

- Magic spells, curses, or the evil eye do not cause cancer.
- Birth control methods (see Family Planning) do not cause cancer.
- Cancer is not a punishment for having done something wrong.
- Cancer does not spread from one person to another—it is impossible to get cancer from being near, spending time with, or taking care of someone who has cancer.

Some activities like cigarette smoking do cause cancer. Some chemicals that get into our bodies at work or through foods, products we use, and from air or water pollution cause cancer. There are ways to prevent cancers (see pages 23 to 25) but there are many things that cause cancer that individuals have little control over. Even when 2 people are exposed to the same harmful things, it does not mean they will both get cancer.

Because cancer and its causes can seem mysterious, people with cancer are sometimes avoided or treated poorly by others. This can make their illness worse. People with cancer need our love and support.

Cancer Treatments

Cancer treatments are used both to try to cure cancer, and also to help a person live longer with cancer and have a better quality of life.

The type of cancer treatment depends on the kind of cancer a person has, whether it is only in one part of the body or has spread to other parts, and how healthy the person is. Treatment methods may be used alone or in combination, or another treatment method might be used if the first does not work well enough. There are 4 main types of cancer treatments.

1. Surgery—removes cancer cells from the body.
2. Chemotherapy—uses medicines to kill cancer cells.
3. Radiation—uses beams of high energy to kill cancer cells.
4. Hormone therapy—uses medicines to stop hormones that make cancer worse.

While treatments may have uncomfortable side effects, they are often the only way to destroy the cancer, allowing the person to get well.

Some methods cost more than others, and some are not available everywhere. So unfortunately, inequality also determines treatment.

Just as cancer affects people differently, so do treatments for cancer. For example, some people get bad side effects while others tolerate treatment better. Or the same treatment may be effective in fighting one person's cancer, but may not work so well for someone else. Treatments affect people's feelings and mental health differently too.

Remission

When cancer treatment is successful, the cancer is no longer detected in the body. The word "remission" is used instead of cure, because there is still a chance that the cancer may return later. A person can be in partial remission when treatment has stopped the cancer from growing, but the tumor is still there.

You will need regular checkups after cancer treatment.
How often depends on the kind of cancer.

Surgery

When cancer is found in only one part of the body, it may be possible to successfully remove it through surgery. Sometimes small cancers can be cut out in a local health center. Other cancers require hospital stays for surgery and the person will need more time to recover.

Sometimes surgery is combined with chemotherapy or radiation to kill any remaining cancer that was not removed by surgery.



Chemotherapy

Some cancers can be treated with medicines. This is called chemotherapy. Chemotherapy medicines are often expensive although many have become much more affordable in recent years. National health programs should make these medicines available so more people can be treated and survive cancer.

Chemotherapy can be used to:

- stop the cancer from spreading to other parts of the body.
- slow the cancer's growth or shrink the cancer.
- kill the cancer.

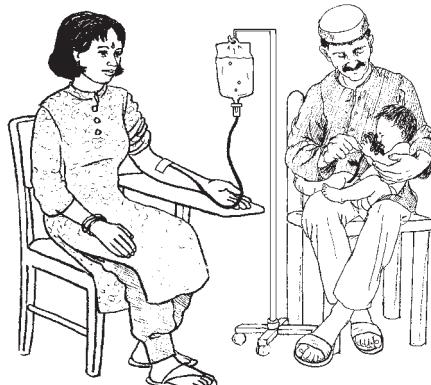
Sometimes chemotherapy is the only treatment needed, but often it is used in combination with another treatment method. For example, chemotherapy may be used to shrink a tumor to make it easier to remove with surgery. Or it may be used after surgery or radiation to kill any cancer that remains.

Chemotherapy medicines come in different forms. They may be pills or liquid taken by mouth. Most often, chemotherapy medicines are given in the vein (IV). It is also common to use more than one chemotherapy medicine.

How often chemotherapy is needed, and for how long, depends on the kind of cancer and the chemotherapy medicine. It also depends on how your body reacts to the treatment, which can vary from person to person. Chemotherapy can be given daily, weekly, or monthly, but there are usually breaks between treatment cycles to allow your body to rest and recover.

Chemotherapy is good at killing cancer cells, but it also affects healthy cells. Healthy cells can usually recover, but chemotherapy can be hard on the body. Chemotherapy commonly causes uncomfortable side effects:

- Nausea (see *Helping reduce nausea*, page 8).
- Irritation inside the nose and mouth. There might be redness, sores, and sometimes burning pain in the mouth and throat. The person's sense of taste may change, and food can taste like metal or overly bitter or sweet. To reduce mouth sores, rinse your mouth several times a day with a mixture of: 1 cup of safe or boiled water cooled to just warm, 1/4 teaspoon baking soda, and 1/8 teaspoon salt. Then rinse with clean water.



- Tiredness. Rest when you need to. A 15-minute walk every day may give you more energy. Drinking plenty of water and other liquids can help.
- Hair loss. Chemotherapy kills cancer and other fast-growing cells, including hair cells. Hair will grow back when treatment ends.

Side effects may get worse a few days after treatment, but they all get better with time.

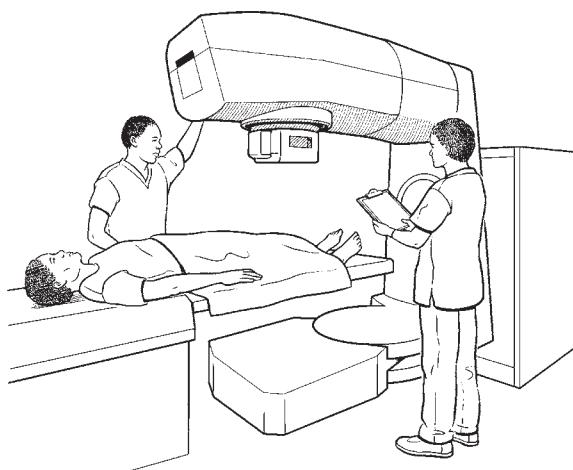
Take care of yourself during chemotherapy treatment:

- Rest when you need to.
- Eat healthy foods (see Good Food Makes Good Health).
- Avoid alcohol, which may affect the chemotherapy drugs and your liver.

Radiation (radiotherapy)

Like chemotherapy, radiation kills cancer cells and other fast-growing cells. Radiation may be used to remove the cancer, or to slow the growth of cancer. Radiation may be used alone or in combination with surgery or chemotherapy.

Radiation machines send a beam of high energy to kill cancer cells. Radiation may be a good treatment when the cancer is found early, before it has spread to other areas in the body (metastasized). This is because, unlike chemotherapy, radiation is targeted to a specific area and does not affect the whole body. Radiation treatments may rid the body of cancer temporarily or permanently.



A radiation treatment is not painful. You will lie on a treatment table underneath the radiation machine for about 15 to 30 minutes. The number of treatments and how often you receive them depend on the kind of cancer and the size of the tumor.

Common side effects of radiation:

- Tiredness. Rest when you need to. A 15-minute walk every day may give you more energy. Drinking plenty of water and other liquids can help.
- Loss of appetite. It may be easier to eat many small meals rather than a few large ones. If eating is painful, try soups or soft foods that are easy to eat.
- Skin changes. The skin over the area that was treated may become pink or darker in color. It also may begin to hurt, feel burned, dry or itchy, show mild swelling, or develop a rash or blisters.
- Nausea (see Helping reduce nausea, page 8).

Side effects will go away with time.

Take care of yourself during radiation treatment:

- Rest when you need to.
- Eat healthy foods like fresh fruits and vegetables, protein foods, and whole grains (see Good Food Makes Good Health).
- Care for the skin in the area that was treated. Gently clean the skin every day. Avoid anything that may irritate the skin, such as tight clothing, powder, or perfumes.
- Protect your skin from the sun by wearing a hat and loose clothing that covers your entire body.

Hormone therapy

Medicines that affect the body's hormones can cause a tumor to shrink or slow cancer growth. This is called hormone therapy. These medicines usually come as pills, but some are injected. Hormone therapy can be combined with one or more of the other common cancer treatments: surgery, chemotherapy, or radiation.

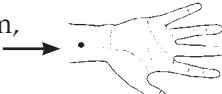
Possible side effects of hormone therapy:

- Tiredness
- Weight gain
- Memory problems
- Changes in mood or depression
- Suddenly feeling very hot, and sweating
- Lack of desire for sex



Helping reduce nausea

Feeling nauseous can be a side effect of chemotherapy or radiation treatments. Besides making you feel bad, if nausea stops you from eating, you will not get enough nutrition. Your clinic may have medicines to reduce the nausea. Some people need to try different medicines before they find one that works for them. Also try these other ways to reduce nausea and to feel better on the days and weeks you have the treatments.

- Eat crackers, dry bread, dry tortillas, dry chapatis, or other grain food to calm your stomach. Avoid any foods that make you feel worse, especially fried or spicy foods.
- Eat many small meals instead of 2 or 3 larger ones, and take small sips of liquid often. Drinking more water than usual during the day will help.
- Sit up for a while right after eating instead of lying down.
- Use acupressure to relieve nausea. Press on the spot 3 fingers above the wrist between the 2 tendons on the inside of the arm, moving your finger in small circles. Press firmly but not hard → 
- Drink mint or ginger tea. To make mint tea, put a teaspoon of mint leaves in a cup of boiled water. Let the tea sit for a few minutes before drinking. To make ginger tea, boil crushed or sliced ginger root in water for at least 15 minutes.
- Where marijuana is legal, some people use it to lessen nausea or make you feel like eating. 

On treatment days, some people eat a small snack before treatment. Others find that eating or drinking right before or after treatment makes them feel sick so they avoid this. During treatment, try chewing a slice of fresh ginger if nausea starts. After treatment, wait at least 1 hour before you eat or drink.

Other cancer treatments

There are many other methods that people use to try to cure cancer or to help ease the effects of cancer. These include spiritual healing, hypnosis, meditation, herbal remedies, special diets, exercise, acupuncture, and massage. Often these methods help people receiving chemotherapy or radiation because they help the body recover faster and reduce side effects from cancer or cancer treatment. Talk with a health worker about which methods go well together. These methods also may lessen the anxiety or depression that is common for people with cancer so they can make you feel a lot better. And they can help a person feel more comfortable if he is no longer having chemotherapy or radiation treatments, or is dying from cancer. None of these methods has been proven to cure cancer when used by itself.

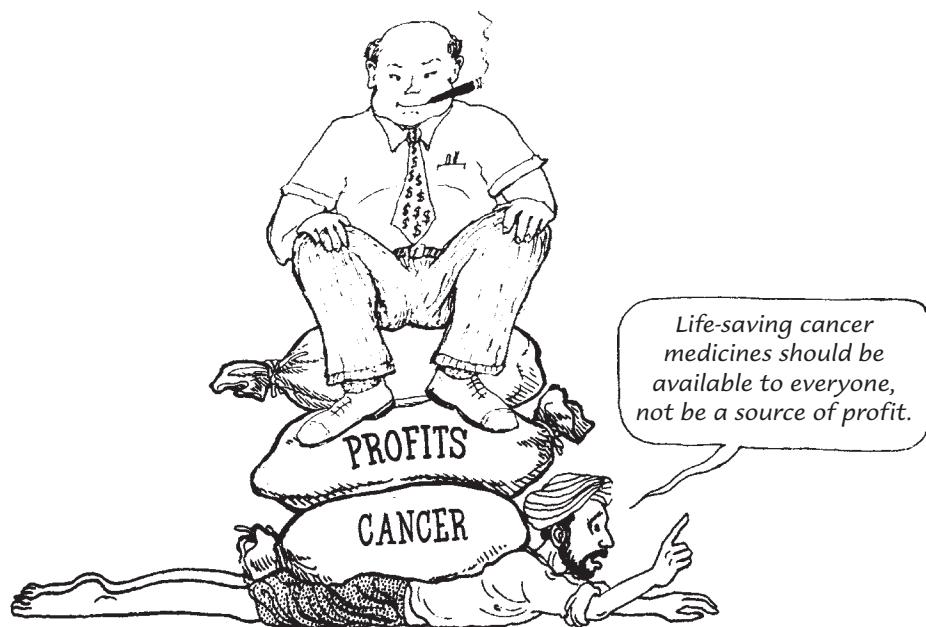
Unfortunately, there are people, including doctors, who take advantage of the hope or desperation of people with cancer and claim they have special or secret treatments to cure cancer. Sadly, because of these false promises, people waste money or delay getting a treatment that would help them more.

Cancer and Inequality

Cancer is a difficult problem for everyone, but it is worse for people who are poor. People who are poor or marginalized are more likely to be exposed to things that cause cancer because they live where pollution is worse. They work in more dangerous jobs, and they are subject to more stress. Eating a variety of good food (fresh fruits and vegetables, protein, and whole grains) can help prevent cancer, but some people cannot afford to eat well. And poor people often cannot afford or do not have access to the screenings, medicines, and health services that could find and treat their cancers.

For all these reasons, we say that poverty and inequality also cause cancer.

Drug companies that develop medicines for cancer are often not interested in the health of the people, but in making money. In 2014, the head of the Bayer pharmaceutical company said their new, very expensive cancer medicine was not for people in India, but for “Western patients who can afford it.”



Common Cancers

Each type of cancer is different, with different causes, signs, and options for treatment. Some cancers are easy to prevent and treat, and some are deadly. Even in places where people live in poverty, many types of cancer can and should be treated.

Lung cancer

SIGNS

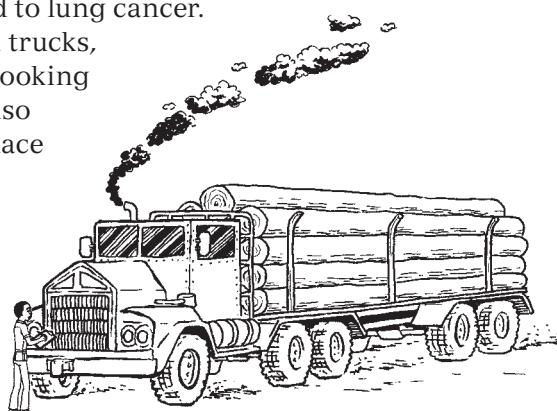
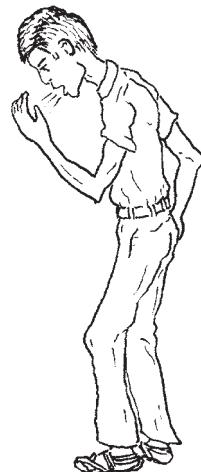
- Cough
- Coughing blood
- Chest pain, usually on one side
- Difficulty getting enough breath

Once someone has these signs, lung cancer is usually very advanced.

Lung cancer is the most common cancer, and it is also one of the most preventable. Its cause is usually smoking, and no matter how long you have smoked, quitting smoking at any time decreases your chances of getting lung cancer. Cigarette smoking also causes other cancers. A person living in a home with someone who smokes or who works where people smoke will also be harmed, even if she doesn't smoke herself.

Other types of smoke also lead to lung cancer. For example, diesel exhaust from trucks, factory smoke, and smoke from cooking fires. If you smoke **and** you are also exposed to smoke in your workplace or home, your chances of getting lung cancer are higher.

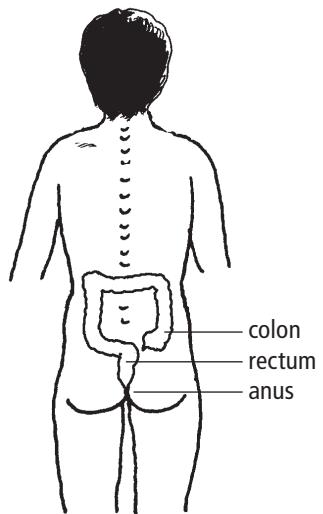
Lung cancer is usually deadly. The best way to prevent lung cancer is to quit smoking. For help, see Drugs, Alcohol, and Tobacco (in development).



Colon and rectal cancers

With these 2 cancers of the lower digestive system, also called the bowel, you are more likely to get them if other close family members have them. They are also more common in people who already have another kind of bowel disease, such as sores inside the bowel (ulcerative colitis). Some clinics screen for these cancers by taking a sample of a person's stool and testing it for traces of blood (with a fecal occult blood test or fecal immunochemical test—FIT).

These cancers happen less in men and women who eat vegetables, fresh fruit, whole grains, and other foods with fiber every day. (See Good Food Makes Good Health, page 11, for more on fiber.) Drinking less alcohol and not smoking also protect against these cancers.



SIGNS

- Black or bloody stool
- Belly (abdominal) pain
- A change in how you normally pass stool: increasing or decreasing frequency, or more diarrhea or constipation

Anemia can also be a sign (see Good Food Makes Good Health, page 8). A feeling of weakness, and weight loss are signs if the cancer is more advanced.

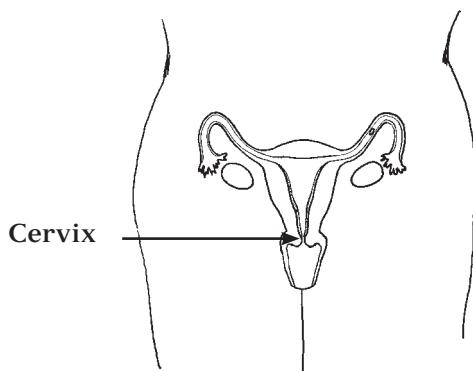
TREATMENT

If found early, these cancers can be treated with chemotherapy or removed with surgery. Depending on where and how much of the bowel is removed, the surgery may also include a temporary or permanent colostomy. In a colostomy, the surgeon stitches an opening in a healthy part of the intestine to an opening in the abdomen so stool can bypass the part where the cancer was removed and go directly into a container, usually a bag outside the body. As treatment and surgery techniques for colon and rectal cancers improve, fewer colostomies are needed.

Cervical cancer

When cancer affects the main part of the womb (uterus), it is called uterine cancer. When cancer affects the opening of the womb, it is called cervical cancer. Cervical cancer is a very common, slow-growing cancer that is very treatable if found early. And with good health care programs, it could be prevented altogether.

HPV, a common virus passed through sexual contact (see Genital Problems and Infections – in development), is the main cause of cervical cancer. HPV is so common that most men and women get it eventually. Only some types of HPV lead to cancer.



A vaccine against HPV prevents most of the cancer-causing types of this virus (there are many types). A vaccination program for all girls and boys in your community can greatly reduce the number of women who will get cervical cancer, but it will not eliminate this cancer altogether. Screening so it can be found and treated early is most important. Both screening and treatment for cervical cancer are easy to do and very successful.

Cervical cancer is common in women who have HIV because their immune systems cannot fight infections well. It is very important for women with HIV to get tested for cervical cancer regularly—once a year, if possible.

SIGNS

At first, cervical cancer has no noticeable signs. Later, there can be bleeding from the vagina during sex, or any time outside of menstrual bleeding. If the cancer is not treated, it may cause pain—first in the lower back or pelvis, and later down the backs of the legs.

TESTING

Cervical cancer is rarely deadly when it is found early. Screening programs that regularly test all women are easy to set up, even at very small community clinics. Each of the 3 different tests for cervical cancer has its benefits:

- **Visual inspection or vinegar test**, (looking at the cervix after painting it with vinegar or Lugol's iodine). This is very low cost, does not require a laboratory, and is easy to learn how to do. Sometimes other tests are used to make sure of the result. To learn how to do visual inspection, see *A Book for Midwives*, available from Hesperian.

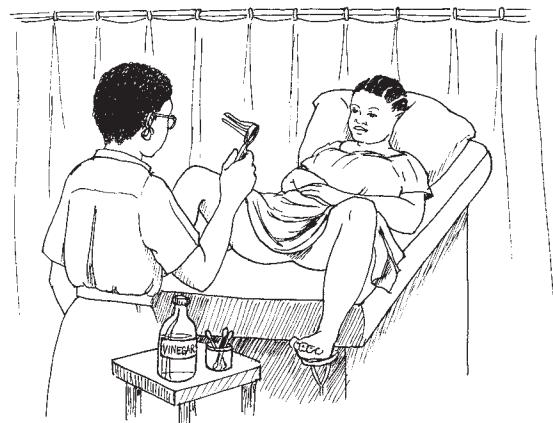
- **The Papanicolaou test, or Pap smear.** Pap tests are very reliable but might not detect every case. Therefore they should be repeated every 3 years or so.
- **The HPV test.** This tests for the HPV virus that leads to cervical cancer. It may be given by itself, done along with the Pap test, or after a Pap shows there could be cancer.

TREATMENT

Cervical cancers caught early are among the most successfully treated. Some treatments are so easy and inexpensive they can be done in a clinic by a trained health worker, right after the examination that detected cancer.

- **Cryotherapy** freezes part of the cervix using carbon dioxide or nitrous oxide gas. Freezing destroys abnormal cells and prevents them from developing into cancer. Cryotherapy is not painful and is very safe. Cryotherapy is low cost and is easy for health workers and midwives to learn how to do. See *A Book for Midwives*, available from Hesperian.
- **Loop electrosurgical excision procedure (LEEP)** uses a metal loop with electricity running through it to remove the area of the cervix that has abnormal cells. LEEP is needed if the area of abnormal cells on the cervix is large, or extends inside the opening of the cervix.
- **Cold knife conization** uses a surgical knife to remove a larger part of the cervix if the area of the pre-cancer is very large. It is done by a specialist. Cold knife conization may make it more likely for a woman to have a miscarriage or other complications during future pregnancies.

If the cancer is advanced, it might be necessary to remove the uterus through surgery (hysterectomy). This makes pregnancy impossible, but it makes surviving the cancer very likely.



Tests for cervical cancer may be a little uncomfortable, but are not painful.

Bladder cancer

There are 3 common causes of bladder cancer:

- Smoking.
- Exposure to toxic chemicals, usually at industrial work (in factories and mines). For example, bladder cancer is more common in workers who manufacture or work with metals, paints, rubber, leather, fabric, carpets, cement, and plastics. It is also more common in miners, electrical workers, and others who work with chemicals and their fumes.
- Schistosomiasis (see Other Serious Illnesses, in development). In places where this disease is widespread, it is the most common cause.

SIGNS

- Blood in the urine.
- Having to pass urine very urgently or more often.
- Pain on one side of the lower back, just above the middle of the pelvic bone, or in the perineum (between the anus and the vagina or testicles).
- Urinating may be difficult, but most people with bladder cancer have no pain when they urinate.

These are all common signs of other bladder problems too. See Difficulties with Urinating (in development).

TREATMENT

Bladder cancer is usually treated with surgery to remove a tumor or the part of the bladder that has cancer. Chemotherapy may also be used to shrink the tumor before surgery, or to prevent the cancer from returning after surgery. If the tumor is very large, the entire bladder may need to be removed by surgery.

Bladder cancer can come back. Regular follow-up tests are needed after treatment to make sure the cancer has not returned.

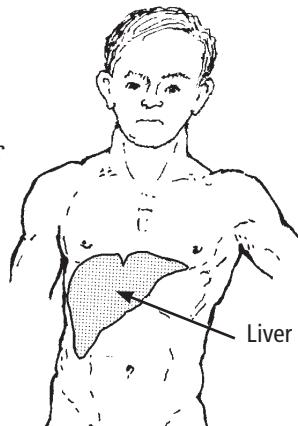
Liver cancer

Liver cancer is particularly serious and is difficult to treat. It is most common in men.

SIGNS

There are usually no signs. However, almost everyone with liver cancer has had hepatitis or cirrhosis (liver scarring from alcoholism or disease), so the person with liver cancer may have signs of liver disease:

- Jaundice (yellow color to the skin or eyes)
- Pain in the upper right abdomen
- Swelling belly
- Feeling tired all the time (fatigue)



PREVENTION

This cancer is difficult to treat, but the hepatitis B vaccine helps prevent many cases. For information on hepatitis, see Belly Pain, Diarrhea, and Worms, pages 17 to 19.

To prevent cirrhosis caused by alcohol, avoid drinking more than a glass or two of alcohol a day. If you already have liver disease, such as hepatitis, you can make liver cancer less likely by never drinking alcohol.

Breast cancer

Breast cancer is one of the most common cancers in women though men can have breast cancer too. When found early, breast cancer can be treated very effectively. Treatment may include surgery, radiation, chemotherapy, hormone therapy, or some combination of those.

Any person can learn to examine the breasts for any lumps or unusual signs. Cancerous lumps are usually hard, painless, jagged in shape, and unmoving under the skin. Check each breast separately. Further testing by x-ray (called mammography) or ultrasound can determine if a lump is likely to be cancer, but you will need a biopsy to be sure.



A thorough breast exam takes several minutes. The woman or her health worker systematically and firmly massages each point before moving to a new point. Feel for anything unusual such as a lump, thickening, or color change. Do this for the whole breast and under the arm.

There is not much to do to prevent breast cancer, although eating well, avoiding smoking and alcohol, and getting regular exercise helps. Breastfeeding also gives some protection.

Stomach cancer

SIGNS

- Belly pain
- Weight loss
- Difficulty swallowing
- A mass you can feel in the belly
- Black stool (can look like tar)



A common cause of stomach cancer is infection with H. pylori, the bacteria that causes most ulcers (see Belly Pain, Diarrhea, and Worms, page 12). While H. pylori increases the risk of stomach cancer, other things also make stomach cancer more likely, such as cigarette smoking, eating a lot of processed meats, red meats, fried food, and foods preserved in salt.

Most stomach cancers are difficult to treat successfully. It is much better to prevent this cancer. Eating fruits, raw vegetables, and whole grains every day gives some protection.

Prostate cancer

Men have a prostate gland, located just below the bladder, that grows larger as they age. Prostate cancer usually grows slowly and can take years to grow enough to cause any problems. As with other cancers, treatment for prostate cancer works best when the cancer is found early. Even prostate cancer that has spread can be treated successfully. Prostate cancer is common in men older than 65, and many older men who have prostate cancer live with it until they die, usually from other causes.

SIGNS

Prostate cancer may have no signs in its early stages. Most men don't know they have it until it is found during a medical exam.

The most common sign is problems with urinating, but this can also be caused by a non-cancerous enlarged prostate, common in older men.

Reasons to see a health worker:

- Difficulty starting or stopping the flow of urine
- Needing to urinate often, especially at night
- Pain or burning during urination
- Blood in your urine or semen
- Deep and frequent pain in your lower back, belly, hip, or pelvis

A blood test called the prostate-specific antigen (PSA) can help detect prostate cancer. A high PSA may mean prostate cancer, but it could also mean that you have an enlarged or infected prostate (see Difficulties with Urination, in development).

TREATMENT

How prostate cancer is treated (surgery, radiation, chemotherapy, hormone therapy, or a combination of these) will depend on the kind of cancer cells, if they have spread, your age and general health, and your preferences.

Some prostate cancer grows so slowly that the only treatment is to have regular check-ups.

Skin cancer

Skin cancers are common among light-skinned people, and rare among dark-skinned people, but can happen to anyone. They happen most often to adults who had severe sunburns when they were children.

There are 2 main types. Non-melanoma skin cancer, the most common type, is easily treated because it grows slowly and can be cut out by a health worker. The other main type, called melanoma, is the most dangerous kind of skin cancer.



A non-melanoma cancer often looks like a slowly-growing red or pink bump, sore, or scab on the face or elsewhere on the skin. These should generally be cut out if they continue to grow because they can spread cancer inside the body.

Melanoma is a skin cancer that is fast growing and dangerous and should be treated right away. First the affected area is cut out. Other treatment may be needed if the cancer has spread to other parts of the body.

SIGNS OF MELANOMA SKIN CANCER

A melanoma looks different than a mole in one or more of these ways:

-  Has an uneven, unusual shape that isn't a circle or an oval
-  Has jagged or uneven edges
-  Has different colors in the same mole
-  Changes in size, color, or shape

PREVENTION

Protect children, especially fair-skinned children, with hats, clothes that cover arms and legs, and sunscreen lotion.

If you work outdoors, cover your skin and wear a hat.



Kaposi's sarcoma

A skin cancer that affects some people infected with HIV, Kaposi's sarcoma shows as red, brown, or purple-colored patches inside the mouth or anywhere on the body.

SIGNS:

Painless patches that look like swollen bruises around or inside the mouth, or anywhere else on the body. The patches rarely become infected or painful, unless they open.

TREATMENT:

See a health worker or doctor who is experienced with HIV. Antiretroviral medicines (ARVs) tend to prevent this cancer in people with HIV, and starting ARV treatment can keep it from getting worse. Sometimes Kaposi's sarcoma is treated with chemotherapy or with other medicines.

Cancer in Children

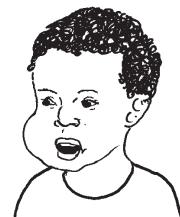
Cancer in childhood is uncommon. The most common cancers in children are leukemia (blood cancer) or a brain tumor. In general, childhood cancers are more easily treated and cured than adult cancers.

Most cancers in children are not easy to identify. Usually, the signs are vague, like ongoing weight loss, headaches with vomiting in the morning, lasting swelling or pain, lasting fevers, or unusual bruising or bleeding. All of these can be signs of other problems—some serious, some not. If a child has any lasting health problems, she should have a medical exam with a health worker.

Burkitt's lymphoma

Especially in parts of Africa, a common childhood cancer is Burkitt's lymphoma. It starts as a lump on the face, on the upper or lower jaw. Unlike mumps, or the swollen glands common with HIV, only one side of the face swells and it swells very quickly. It can double in size in one day. It is not painful, though very early on it may cause discomfort. The teeth near the swelling are usually displaced or loosened. It can also be mistaken for a tooth abscess.

Burkitt's lymphoma is treated with chemotherapy. When treatment starts early, it is usually very successful.



If You Have Cancer

Finding out you have cancer is frightening to say the least. But there are some things you can do to help fight the cancer and feel better.

- If you think you have cancer, try to find a doctor or clinic that has experience with cancer. You may need more than 1 test to know for sure.
- If you are told you have cancer, ask the doctor about the disease. What happens to most people who have this type of cancer? What can you do to live longer or survive the cancer?
- Get treatment quickly. Many cancers can be successfully treated when caught early. What choices do you have about treatment? What are the side effects of the treatments?
- Talk to others who have cancer. They often have helpful advice and can be understanding listeners especially if they have had your kind of cancer and are doing well.
- Do not believe rumors or stories uninformed friends and family tell you. They are often untrue.
- Eating nutritious food keeps you stronger.
- Exercise daily — even a short walk. Find ways to relax, such as yoga, meditation, or just spending a few minutes quietly by yourself.
- Find people who can help you. Cancer and its treatments can cause tiredness, nausea, and pain. Cancers can be disabling and make it hard to get around or work. A community health worker may know of helpful resources.

Promoting general health and well-being must be central to any cancer treatment.

Learning you have cancer, undergoing treatment, and accepting that you are sick can be very difficult emotionally. Feelings of hopelessness or worry are normal. Care for the mental and emotional parts of being sick are just as important as any physical or drug treatment. There are many ways to get this help.

- Spend time with loved ones.
- Talk about your feelings and fears with someone you trust.
- Pray or participate in activities with your religious group.
- Continue activities that you enjoy.
- Relax with music, meditation, and gentle exercise.



For more on how to help with feelings of depression or anxiety, see Mental Health (in development).

Health workers can help people with cancer

Community health workers can learn about cancer prevention and treatment, and share that learning with others.

Help the person with cancer and the family:

- Help them feel they are not alone.
- Introduce them to other people who have had similar experiences.
- Support them to find healthy food, transportation, and help managing their home and children, maybe by involving community groups, churches, or government services.
- Keep a list of clinics, doctors, and organizations that help people with cancer in your region or country.
- Help the person with cancer manage her pain, discomfort, and fears.
- Help people with cancer and their families avoid those who would take their money and promise miracle cures that don't work or make people worse.



Work toward cancer awareness and prevention:

- Encourage people to learn the early signs of cancer and not to be afraid of getting tested or treated because doing so early is so important.
- Give classes to help people stop smoking.
- Vaccinate people against hepatitis B and HPV.
- Screen women for cervical cancer and for other cancers if screening is offered by health authorities.
- Seek training for yourself or other health workers to treat some kinds of cancer. Midwives can learn how to diagnose and prevent cervical cancer.
- Help people organize to keep chemicals and other pollution out of community water, land, and air.
- Motivate the community to help and treat people with cancer kindly, and not to blame them for their illness.

Easing the Severe Pain of Cancer

Cancer pain may be caused by the cancer itself or from a treatment. For example, people getting chemotherapy may have mouth pain.

As a cancer gets worse, the pain caused by the cancer can become very severe. Strong pain medicines (such as morphine or codeine) relieve pain best, and the dose of these medicines may have to be raised gradually from smaller to higher amounts to work well.

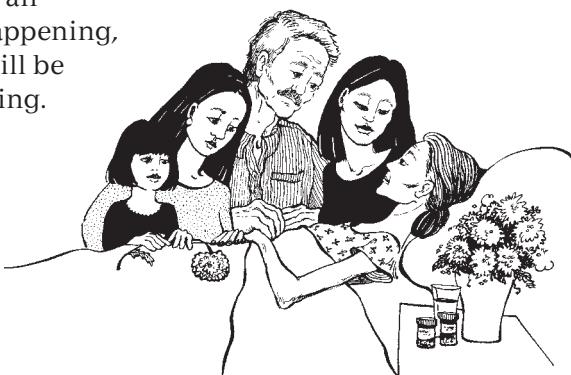
Because they can be habit-forming, strong pain medicines (narcotics) are often not available. Governments and even well-meaning health workers restrict their use out of fear of drug abuse and addiction. This causes needless suffering for those with cancer and other chronic illnesses. These medicines are listed on the World Health Organization's Model List of Essential Medicines, but more needs to be done to ensure they are available to people with cancer and others suffering severe pain. We should work against the stigma attached to these medicines, and recognize relief from pain as a human right.

Other ways to ease the pain of cancer or cancer treatments include acupuncture, massage, and physical therapy.

End of life care

There are cancers that cannot be cured, no matter where you live or how much money you spend. While it will not cure cancer, a positive attitude will help lift the spirits and improve the days of someone with cancer and her loved ones. Keeping a good attitude can help a person build the needed strength to get through each day, whether they are getting treatment or not.

For cancers that cannot be cured, eventually a time will come when it becomes clear that death is near. When this happens, help the person and those who love her come to an understanding about what is happening, and prepare. Remind her you will be there for her in living and in dying. She may need medication to reduce pain, and loving care to bring comfort and ease the transition to death. See Caring for Sick People (in development) for more about caring for someone as they die.



Much Cancer Can Be Prevented

Many different things may cause cancer, and usually there is no way to know if one particular thing was the cause of a person's cancer except for:

- **Lung cancer**, usually caused by smoking tobacco (see page 10).
- **Cervical cancer**, usually caused by a viral infection (see page 12).

Most other cancers seem to come from a combination of exposures to certain harmful things.

While we cannot prevent all cancers, we can lower our risk of getting cancer by limiting the things that make cancers more common.

Avoid smoke and smoking

- Tobacco smoking is one of the main causes of cancer around the world. Smoking causes lung cancer and also cancers of the colon, bladder, and neck. It leads to heart attacks, strokes, lung infections, and ulcers, and when pregnant women smoke or breathe other's cigarette smoke, their babies are more likely to be sick or dangerously small. Stopping smoking makes cancer less likely for the smoker, no matter how old you are when you quit, and protects family and friends too. See Drugs, Alcohol, and Tobacco (in development) for more on how to stop smoking.
- Indoor cooking fires increase the chances of cancer and lung diseases. Building a no-smoke or low-smoke cook stove and venting smoke outside reduces the possibility of cancer for the whole family. See *A Community Guide to Environmental Health*, pages 359 to 364.
- Pollution from factories, cars, and trucks causes cancer. When people demand it and laws require it, they can be made to produce less smoke and less cancer.
- Work in a smoky environment is dangerous. If you and your co-workers can get your boss to improve ventilation, or at least provide you with filtered masks (respirators), your health will be better.





Drink less alcohol

Drinking more than a glass or two of alcohol a day makes several cancers more likely. Breast cancer, liver cancer, stomach and intestinal cancer, and mouth and throat cancer all may be related to drinking alcohol. Drinking less can also leave more money for food and other family needs. See Drugs, Alcohol, and Tobacco (in development) for more on how to stop drinking.

Avoid and treat infections

- H. pylori, the bacteria that causes stomach ulcers, can lead to stomach cancer if it is not treated. If you have a stomach ulcer that keeps coming back, treat it with the medicines described on pages 13 and 53 of Belly Pain, Diarrhea, and Worms.
- Hepatitis B and C can lead to liver cancer. There is a vaccine for hepatitis B, and both hepatitis B and C can be prevented by using condoms during sex and not reusing needles for injections. See pages 18 to 19 in Belly Pain, Diarrhea, and Worms for more on hepatitis.
- HPV (human papilloma virus, a sexually transmitted infection, see page 12) causes cervical cancer in women and several other cancers in both men and women. There is a vaccine to protect against HPV.
- HIV makes certain cancers more common, especially Kaposi's sarcoma, non-Hodgkin's lymphoma, and cervical cancer. Prevent HIV by using condoms during sex and not reusing needles.

Good food makes good health

Eating habits can contribute to or protect against cancer. Eating whole grains, and fresh vegetables and fruits every day helps protect you from many cancers and other illnesses. Storing grains and beans in a ventilated space prevents spoilage by a mold that is one cause of liver cancer. In Good Food Makes Good Health, see page 13 for how to eat well even when you have little money, and pages 31 to 32 for safe ways to store harvests.

Access to healthcare

When people have access to good quality healthcare, they have better health and more cancer is prevented. Access to healthcare also helps to find cancers early which makes treatment more successful.

Avoid exposure to chemicals

Thousands of chemicals are made and used in industry and agriculture, and then released into the air we breathe, the water we drink, and the food we eat. Some of these chemicals are harmful to our health, including some which cause or contribute to cancer. Unfortunately there are no laws that say a chemical must be proven to be safe before it can be used, so we often find out too late about the dangers of chemicals. The increased use of chemicals around the world is one reason rates of cancer are increasing.

Important ways to protect against chemicals and cancer include:

- Assume a chemical is dangerous until it is proven safe.
- Avoid using pesticides and chemical cleaners, or reusing any containers chemicals may have been stored in.
- Don't burn plastics or other trash (this releases toxic fumes into the air we breathe).
- If you cannot convince your boss to change to safer chemicals in your workplace, try not to breathe or touch them. Wear gloves, a face mask, and protective clothing, and wash your hands often so chemicals do not get into your food or your mouth.
- Insist that governments make sure power plants and factories handle their waste safely and do not cause pollution. For more on organizing your community against chemical exposure, see *A Community Guide to Environmental Health*, also available from Hesperian.



When we value human lives more than profits, cancer will be reduced.

Diabetes

What is Diabetes?

When we digest food, it puts sugar into our blood. This sugar is called glucose and our bodies use it to get the energy we need. Sweet things turn into glucose but other foods do too, especially starchy foods such as rice, maize, yam, potato, and bread or other foods made from wheat.

Diabetes means having too much sugar in your blood. With diabetes, instead of giving us energy, the sugar builds up in the blood and causes damage to the body.



Hold a piece of white bread in your mouth.
Can you taste how sweet it is?

The most common type of diabetes is called Type 2 diabetes. Type 2 diabetes is mainly caused by not enough activity, eating unhealthy foods—especially processed, packaged foods—and increased stress and inequality in our lives. Diabetes is a “chronic” disease, which means it can get better or worse, but it never completely goes away.

To live healthier with diabetes, it is very important to control the amount (level) of sugar in your blood. Diabetes is dangerous because high blood sugar can cause problems such as blindness, loss of limbs, loss of ability to have sex, stroke, or even death. When you keep your sugar levels down, these problems can mostly be avoided, and you can have a productive and healthy life. This is called “managing” diabetes.

Can you be healthy with diabetes?

Medicines and medical care cannot cure diabetes. But people can be healthy with diabetes if they learn about the disease and take care to manage the disease themselves. The most important things to do are to eat healthy food, get exercise, keep your teeth and gums clean, take care of your feet, find ways to reduce stress, and get enough rest. In some cases, medicine is needed too.

Health care workers also treat diabetes by bringing people together in support groups to learn about their illness and to care for themselves (see page 29).



Signs of diabetes

Early signs of diabetes are often hard to recognize. Sometimes there may be no signs at all. Many people have diabetes without knowing it.

SIGNS THAT MAY BE FROM DIABETES

- Thirst
- Frequent urination
- Blurred vision
- Lack of energy or gets tired easily
- Slow-healing wounds
- Feet that feel numb
- Repeated yeast (candida) infections for women

These signs are common to many health problems, so you cannot tell if a person has diabetes from these signs alone. Get a blood test to know for sure (see pages 10 to 12).

DANGER SIGNS

When blood sugar levels get too high, they cause:

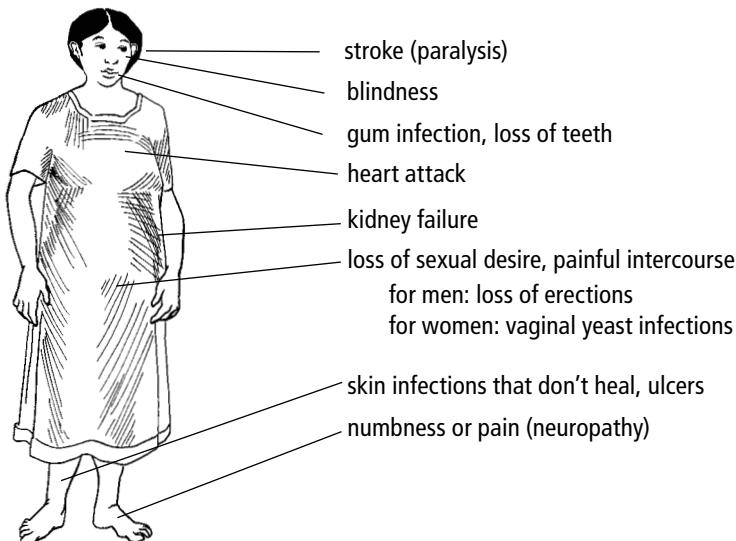
- Severe thirst
- Extreme weakness and sleepiness or confusion
- Hunger
- Weight loss even if the person is eating enough

A person with these danger signs should be tested and treated fast. A person can die from very high blood sugar levels if not treated. See High blood sugar (hyperglycemia), page 32.



Problems caused by unmanaged diabetes

If diabetes is left untreated over months or years, high sugar levels can damage organs, nerves, and blood vessels. This causes serious problems in the body that can cause permanent harm or even death.



High amounts of sugar in the blood can cause nerve damage. Many people with higher levels start to feel pain in their feet or their feet go numb. Higher levels also cause problems with blood circulation that can make wounds on the skin heal slowly. The person may get tired quickly. High blood sugar levels can damage the eyes and kidneys, causing them to function poorly or stop working at all.

All these problems are made worse by:

- High blood pressure (see page 24 and Heart Disease, in development)
- Smoking (see page 24)

Having high blood pressure makes it harder for your heart to work and pump blood, causes damage to other organs, and causes blood sugar levels to be too high. Smoking causes high blood pressure and makes having a stroke or heart attack more likely. It is important for someone with diabetes to stop smoking and lower her blood pressure.

But diabetes does not have to lead to these problems. By eating healthy foods, getting enough exercise, and reducing stress, you can help keep your blood sugar levels under control. Mouth and foot infections can be prevented by learning a few ways to take care of your feet, teeth, and gums (see pages 22 to 25).

Types of diabetes

There are 3 types of diabetes:

Type 1 diabetes usually happens to young people and comes on very fast. The cause of Type 1 is not known. It is much less common than Type 2 (see page 5).

If a child or young adult feels thirsty much of the time, feels weak, or loses weight despite eating well, test him immediately (see page 10). If he has Type 1 diabetes, he needs treatment fast.

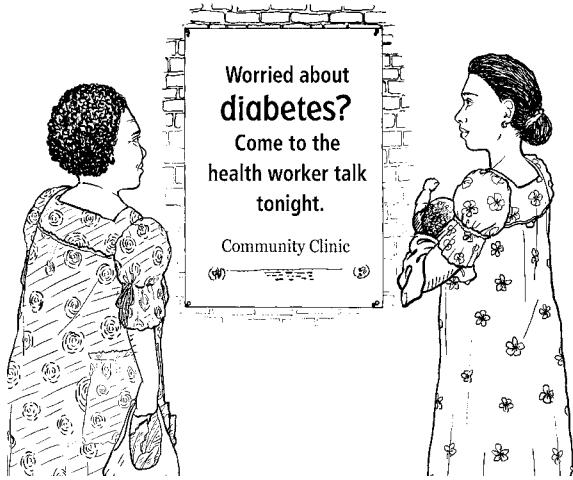
Type 1 diabetes means that this person cannot process sugar well. To live he will need to inject a medicine called insulin every day for the rest of his life. He will need insulin and equipment, and education and support to use it correctly.



The belly is a common place to inject insulin.

Type 2 diabetes usually begins in adults and comes on slowly, but young people can get it too. Most people with diabetes have Type 2 and that is mostly what this chapter covers.

People who eat more factory processed, sugary, and starchy foods and have less physical activity are more likely to get Type 2 diabetes. So are people with big bellies, who have family members with diabetes, or have experienced long-term hunger.



Treating Type 2 diabetes starts with healthy eating, increasing physical activity, and reducing stress. People with Type 2 may also benefit from medicines (pages 18 to 21) or plant medicines (page 21).

Gestational diabetes is a kind of Type 2 diabetes that happens to some pregnant women. A woman with gestational diabetes will have high blood sugar and so will the baby in her womb. After birth, her blood sugar level may return to normal, or the woman may develop Type 2 diabetes.

Mothers with gestational diabetes may have difficult pregnancies and their babies tend to grow too big in the womb, making birth difficult. A woman with diabetes should give birth in a hospital in case she needs a Caesarean delivery. The baby may be born with low or high blood sugar or breathing problems.

Gestational diabetes is mostly managed with healthy eating and sometimes with medicines or plant medicines.

Most women with diabetes can give birth to healthy babies.



Planning a pregnancy when you have diabetes

If you have diabetes and want to become pregnant, it is best to control blood sugar levels before starting your pregnancy. Talk with a health worker if you take medicines for your diabetes, because these may need to be changed before you become pregnant. Although mothers do not pass the diabetes to their babies, diabetes can affect your pregnancy and can affect the baby's health, so it is important to take care of yourself.

What causes Type 2 diabetes?

Unhealthy environments cause most Type 2 diabetes. Many people get sick with diabetes because of too many processed foods coming into their communities and changes in their ways of life that are unhealthy. Causes of diabetes include:

Unhealthy foods

Sugary drinks, sweet and processed foods, and white flours all put too much sugar into the blood, as well as making the body put on extra fat. Processed and packaged foods can be hard to resist. Sometimes they are cheaper, and in cities are often more available than healthy, fresh foods. But these processed foods cause diabetes and other serious health problems.

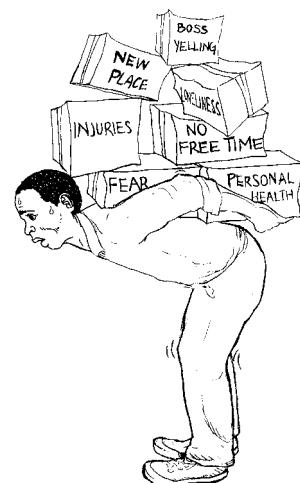


Not moving your body enough

People who are farming, walking, doing physical work or active play will burn up extra sugar in the blood as fuel. People who sit or stand still most of the day do not burn up enough sugar, so it stays in their blood.

Stress

When people are under a lot of stress all the time, their bodies hold on to sugar instead of using it. This causes blood sugar levels to increase.



Fat around the belly

A thick waist seems to make people more likely to get diabetes.

Family members with diabetes

Diabetes runs in families, so people who have family members with diabetes are more likely to get it.

Malnutrition

If people do not eat enough food, their bodies will hold on to the sugar they eat. This can start in childhood or even before birth while a baby is in the womb.

When stress piles up,
it can affect your health.

Aging

Older people are more likely to get diabetes.



Chemicals

Some chemicals affect how our bodies use sugar. Chemicals can reach us in the workplace, through pollution in the community, or because they are added to food or other products we use.

How chemicals contribute to diabetes

Along with the food we eat and the way we live, some chemicals cause diabetes. Working with, eating, drinking, or breathing any of these chemicals is known to raise the risk of diabetes:

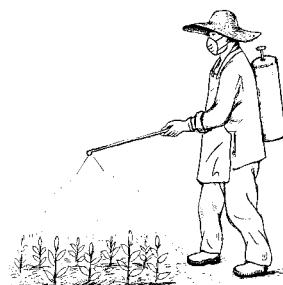
- **Dioxins** are by-products of making pesticides and paper, and from burning plastics.
- **PCBs** are a type of chemical used in industry for insulation and lubrication.
- **Phthalates** are often found in body care creams and oils.
- **Bisphenols** are found in plastic bottles used for bottled water, juice, and soda.
- **Heavy metals** such as lead, mercury, arsenic, and cadmium, are released into the environment by industry, such as oil drilling and refining, mining, and others.
- **Pesticides** are used to kill insects or weeds.

The best way to protect yourself from these chemicals is by not using them. If there are chemicals in your workplace and you cannot convince your boss to change to safer chemicals, try not to breathe them or touch them. Wear a face mask and other protective clothing and wash your hands often so the chemicals don't get on your food or in your mouth.

Chemicals are all around us. Eat foods that have not been sprayed with pesticides. Try to find household cleaners and body care products that have no or few chemicals.

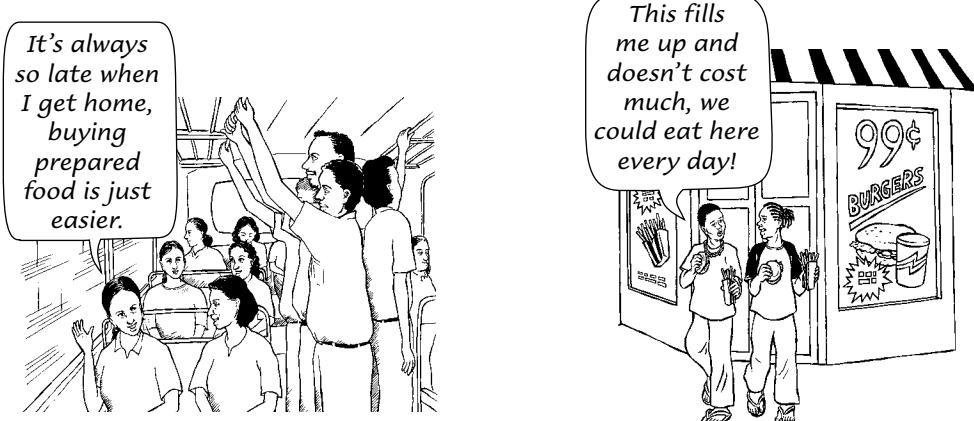
Chemical pollution of water, air, and food by workplaces is a harder problem. It can be solved only when a community pressures owners, and governments enforce rules on industry.

For more on protecting our food, water, land, and air, see *A Community Guide to Environmental Health*.

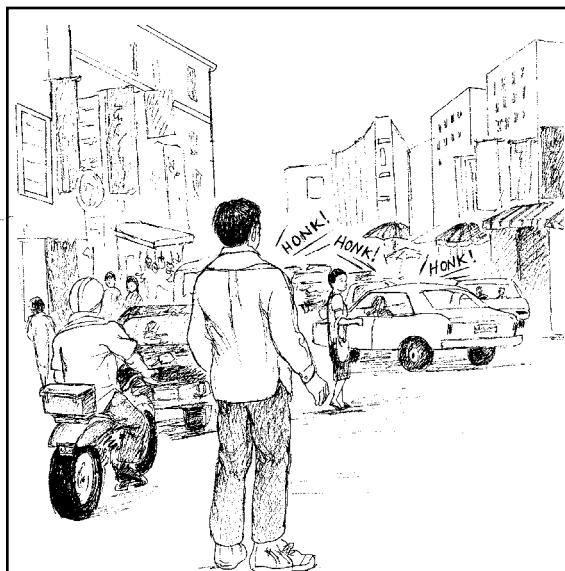


Why Do More People Have Diabetes?

Diabetes and heart-related problems such as high blood pressure used to mostly affect people in rich countries. Now low-income countries have these problems too. They come when traditional ways of life change and families are broken up. New foods, new chemicals, new jobs, and new ways of life change what people eat and how much exercise they get. Some of these changes seem to make life easier but they also raise the risk for diabetes and other chronic diseases. Each year, more people are getting diabetes and getting it at younger ages.



Often the kinds of jobs people have or city life in general means that people do not walk much. They also might sit most of the day at work, or eat more processed and factory foods.



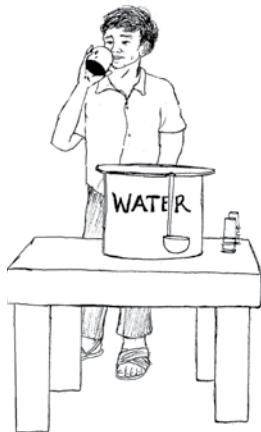
New Place, New Problems

Ten years ago, Amilcar and Serena left their village to find work in the city.

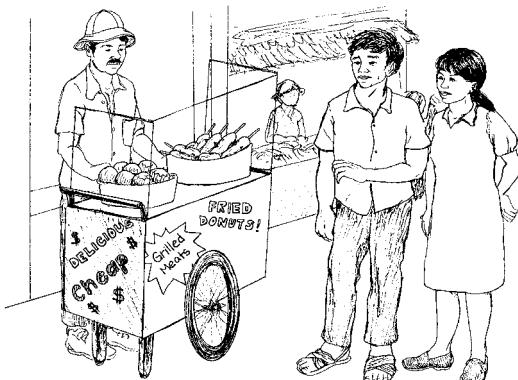
In some ways, life is easier now. Instead of digging and picking all day on the farm, Serena works at a factory. She sits down all day and sews. Amilcar works sweeping floors at the train station.

In the village, they walked everywhere. In the city, walking is dangerous so they take the bus. Amilcar used to play football in the evenings. Now he often goes to a local bar and watches sports on TV to relax.

Their food has changed too. Instead of eating food they grow or gather, they now buy prepared food and sweetened drinks from street vendors or packaged food from stores. These foods taste good. They are fast and easy. But many of these processed foods are high in sugar and full of chemicals.



At home, they will make more meals with fresh vegetables they buy in the market. Hopefully, these changes will help get their diabetes under control.



Serena and Amilcar are both gaining weight around their bellies. Their muscles are not as strong as when they worked on the farm. At a diabetes screening, Amilcar's sugar levels were found to be a little high and Serena already has diabetes and nerve pain in her feet.

The health worker at the screening helped Serena make a plan to walk fast around the factory with some coworkers each day at lunch. He advised Amilcar to drink water, which is available at the train station, instead of sweetened drinks.



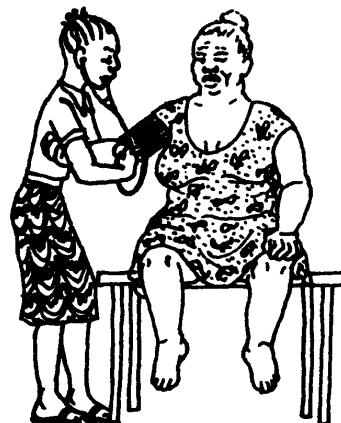
Testing for Diabetes

Blood sugar levels can be tested by a blood or urine test. Blood tests are more accurate.

Who should be tested?

A person should be tested for diabetes if she:

- has signs of diabetes (see pages 2 and 3).
- has a family member with diabetes.
- has a big waistline and is older than 40 years.
- has a history of high blood pressure (see page 24).
- had a baby that was very large (over 4 kg or 9 lb).
- is young and has possible signs of Type 1 diabetes (see page 4).



Blood tests

All types of diabetes can be detected by measuring blood sugar levels. The health worker may do more than one type of test to check for diabetes or may repeat a test. Tests can also be used to manage diabetes by helping you see how the results change in response to changes you make in your diet, activity, or medicine (see pages 18 to 19).

Blood tests measure if a person's blood sugar levels are normal, if they are a little high, or if there is diabetes. If blood sugar levels are high but not yet as high as diabetes, a person can prevent getting diabetes by eating better and healthier foods, and exercising more.

There are 2 common blood tests for diabetes. One is called the Fasting Blood Sugar test and other one is the A1C test.



Fasting Blood Sugar (FBS or FPG) is the most common test. This test is done in the morning before the person eats anything. Some clinics test blood sugar levels with a glucometer, a tool that measures the sugar in a drop of blood taken from a fingertip. Or the clinic might take blood with a syringe and send it to a lab. The result of a Fasting Blood Sugar test depends on the measurement system used by your country. If measured in mmol/l (millimols per liter), the results will be a number between 4 and 20. If you have 6.9 mmol/l or more you could have diabetes. If your country measures in mg/dl (milligrams per deciliter), the result will be a number between 80 and 350. On this scale, people with 125 mg/dl or more could have diabetes.

Less than 5.6 mmol/l or 100 mg/dl: Your blood sugar level is OK.

More than 5.6 mmol/l or 100 mg/dl but less than 6.9 mmol/l or 125 mg/dl: This is a warning—making changes in your life now can prevent you from getting diabetes. If you are close to the higher number, extra effort to eat healthy and get physical activity or exercise is especially important.

More than 6.9 mmol/l or 125 mg/dl: You have diabetes and need treatment. The higher the number, the more likely a person is to have an emergency from high blood sugar (page 32) or serious health problems (page 3).

Some tests can be done with a drop of blood from a fingertip (see page 18). For other tests, a vial of blood will be taken from your arm. A skilled health worker in a clinic can do this safely, causing only a little or no pain.



The A1C test (glycosylated hemoglobin test, also called HbA1C or HgbA1C) gives an average of a person's blood sugar level for the previous 3 months. A person does not have to be fasting to take this test. A clinic will take a blood sample with a syringe and send it to a lab. The result of an A1C blood test will be a percent (%) usually between 4% and 14%. If the result is close to 6.4%, or is higher, you may have diabetes. If the number is only a little lower than 6.4%, you will want to care for yourself in several ways (see page 13) and be tested again for diabetes in the future.

Less than 5.7%: Your blood sugar level is OK.

More than 5.7% but less than 6.4%: This is a warning—making changes in your life now can prevent you from getting diabetes. If you are close to 6.4%, extra effort to eat healthy and get physical activity or **exercise is especially important.**

More than 6.4%: You have diabetes and need treatment. The higher the number, the more likely a person will have an emergency from high blood sugar (page 32) or serious health problems (page 3).

Urine test

Urine tests can show that a person has diabetes. Urine test strips change color if there is sugar in the urine. Test as soon as the person urinates. A person does not need to be fasting for the test.

Urine tests will miss some cases of diabetes because sugar levels have to rise pretty high (10 mmol/l or 180 mg/dl) before sugar gets into the urine. So if the urine test does not show diabetes but there is another reason to think there could be diabetes, get a blood test.

Though you feel fine now, the diabetes is already doing harm. But even small changes in what you eat can keep you healthy.



What if I have diabetes?

Getting diagnosed with diabetes can be worrisome. See page 26 for ways to get support.

Many people have a difficult time accepting they have diabetes. No one wants to believe they have a sickness they will have to manage for the rest of their life. You may not believe there is anything wrong if you do not feel sick. But even if you do not feel it, high blood sugar levels harm your body. That is the bad news. But the good news is you can still live a good, long life by taking care of yourself.

Staying Healthy with Diabetes

Prevent and manage diabetes by eating healthy foods, being active and moving your body, and reducing stress. These things can help you and your family stay healthy even if you do not have diabetes.

**What to
do when
you are
thirsty:**



NO!



YES!

*A sugary drink is like poison for your body — it can cause diabetes.
Water keeps your body well.*

Eat healthy foods

The foods our ancestors ate did not cause diabetes. If possible, eat more food you or others grow, gather, raise, or hunt. Avoid packaged and processed foods and other junk foods and drinks. They are harmful and a waste of money. For more on how to eat well with little money, see pages 12 and 13 in Good Food Makes Good Health. Make a list of everything the family eats in a week. Go over the list with a health worker to talk about what foods help most or which ones cause most problems, and then talk with your family about how to make changes.



Replace starchy foods with vegetables

Starchy foods such as rice, maize, wheat, yam, potatoes, plantain, and cassava are often the main foods people eat. But starchy foods turn into sugar in our bodies. A person with diabetes might be able to handle small amounts of starchy foods, but not larger amounts. Replacing some starchy foods with vegetables and leafy greens adds vitamins and nutrients.

The harder your body works, the more starchy foods you can eat without them causing harm to your body. A person who works in the fields all day can eat more than one who sits or stands still most of the day.



This person has a factory job and must sit all day. She should eat only a small amount of starchy foods, for example: 2 tortillas OR 1 cup of beans OR 2 small pieces of fruit OR 1 cup of rice. She can eat more fresh vegetables or protein foods instead.



This person works outside all day and walks a lot, and starchy food in her meals, along with vegetables and protein foods, helps her have enough energy.

Whole grains are better

Grains are starchy foods that we need for energy. Whole grains with the germ and bran layers still attached, such as brown rice and whole wheat, are healthier. Choose flours made from whole grains.

White rice and flours are processed in factories to remove the nutritious germ and bran so they will last longer on store shelves without spoiling. Without the healthy bran and germ, the processed grains turn into sugar in the body too quickly and can make blood sugar rise to dangerous levels. Try not to eat processed grains.

Eat foods with fiber

Fiber is the tough parts of plants, such as leaves, stems, roots, and sprouts. Fiber helps slow down how fast sugar gets absorbed into the blood. This helps to manage blood sugar, protect the body, and improve digestion. Foods with fiber include vegetables, beans and other legumes, whole grains, fruits, nuts, and seeds.

To get more fiber:

- After pounding and boiling, it is safe to eat the leaves of cassava (yuca) plants. Although people are used to mainly eating the roots of cassava and taro, the leaves of these plants have a lot of fiber.
- Make flour from beans like soy and fava.
- Eat green vegetables as often as you can.
- Eat brown, red, or black rice or whole grains.

Eat protein foods

Combined with a good mixture of other healthy foods, protein foods such as fish, eggs, meat, nuts, seeds, tofu, and tempeh do not raise blood sugar and are good for diabetes.

Eat less packaged food and limit sweet drinks and alcohol

Foods in packages or cans can be tempting. They are easy to store and prepare, and can taste good. But packaged foods usually have too much sugar, salt, and unhealthy ingredients. If you are tired, hungry, or highly stressed, packaged food can be hard to resist. Like drugs or cigarettes, these foods make you feel good for a little while. Then the effect of the sugar passes and you feel worse than before. Everyone in the family will benefit from not eating these foods or at least eating less of them. Many processed foods use palm oil because it is a cheap ingredient but it is less healthy than other vegetable oils.

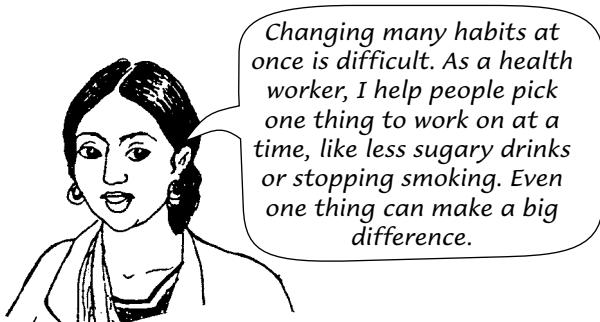


Food companies know how to sell you their products and will even lie and say food is good for you when it isn't. Their goal is to make money, not to keep you healthy.

Sweetened soft drinks are especially bad for you. They contain a large amount of sugar and raise your blood sugar levels very fast. Even fruit juices contain too much sugar. Drink water or tea without sugar instead. You can get used to less sugar in your tea or coffee by using a little less each week. You can add mint leaves or lemon to water or tea for more flavor. Although all fruits have sugar, eating whole fruit instead of fruit juice is better for your diabetes because the fiber in fruit is good for you. Drinks with alcohol also turn into sugar in the body, so avoiding or limiting alcohol is best.

How often to eat

Skipping a meal can lead to low blood sugar (see page 31) or make you eat too much at the next meal. Having a very large meal can raise your blood sugar (see page 32). Eating the same amount of food 3 times a day or having smaller meals 4 times a day can help you keep your blood sugar more steady.



Changing many habits at once is difficult. As a health worker, I help people pick one thing to work on at a time, like less sugary drinks or stopping smoking. Even one thing can make a big difference.

Get more physical activity

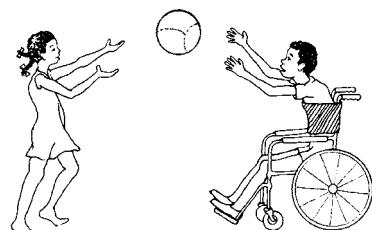
Physical activity is an excellent way to keep blood sugar levels down. Doing at least some movement every day, and not just once in a while, is important. To treat and prevent diabetes, try fast walking, dancing, sports, or any exercise that makes your heart beat faster for 30 minutes or more. The more activity, the better.

In places where daily work is physically hard, you probably get enough physical activity. But if you are sitting or standing in one place all day, you may need to think of ways to move more.

Many people find it easier to be active with others instead of alone. Being active is also easier when it is fun, like walking with friends, playing sports, or dancing.

If you take a medicine such as a sulfonylurea or insulin for your diabetes (see pages 19 to 20), exercising may make your blood sugar levels drop too low. To prevent this, eat food with protein and healthy fats (like an egg or fish) at the meal before you exercise. If you know your blood sugar is dropping during or after exercising, you can drink fruit juice or eat a piece of candy to reverse this. That is why carrying these snacks with you is a good idea.

For signs of blood sugar levels dropping too low, see page 31.



Weight

People with Type 2 diabetes are often heavy. Losing weight can help them be healthier and feel better. This is why people may tell you to lose weight to manage the diabetes. For many people, losing weight is very hard. Stay focused on controlling your blood sugar, increasing physical activity, eating healthy, and lowering stress.

Reduce stress

Stress is the feeling of having more problems than you can solve.

These problems can be about money, family, housing, safety, racism, or other dangers.

Constantly feeling stress causes several physical problems, including raising blood sugar levels.



Talking about what is worrying you with a trusted friend, family member, or support group can help reduce stress, especially when people find ways to help each other. Do not be afraid to ask for help.

Building self-confidence also reduces stress. We often live in fear because others are more powerful than we are. We may feel weak because our health is bad or we do not have enough money. But we can learn to

build upon our own strengths. Some problems may be much bigger than something we can fix by ourselves, and for them we need to work with others (see pages 27 to 29). But there is still much we can do by ourselves. Make plans to try something new to improve your health, like walking more or trying a new food. When you succeed, you will build confidence in your ability to do more.



Meditation, prayer, or exercise such as tai chi and yoga are also good ways to reduce stress.

Manage Blood Sugar with Medicines

Learn how eating, exercise, and medicines affect your body to prevent your blood sugar from going so high that it makes you feel unwell or becomes an emergency (hyperglycemia, see page 32). Medicines for diabetes (see pages 20 to 21 and 33 to 40) can help lower blood sugar levels even more, but too much insulin or sulfonylureas can make them go too low and cause low blood sugar (hypoglycemia, see page 31). If you take these medicines, check your blood sugar levels often until you know what makes them go up and down. That way you can know you are managing your diabetes well.

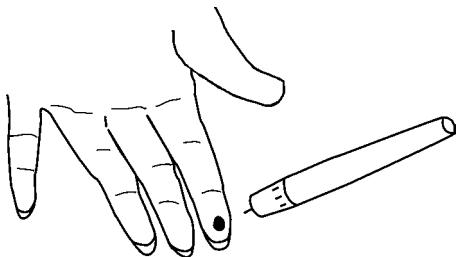
Testing your blood sugar levels

As discussed on pages 10 to 11, blood tests can be used to diagnose diabetes. People also use blood tests to manage diabetes. Using a blood sugar meter (glucometer) and getting an A1C test are two ways of keeping track of blood sugar levels. They give different information, but both are helpful.

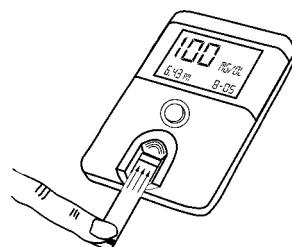
A glucometer is a simple machine that reads the amount of sugar in blood at the moment you test. It is best to test at different times of the day to see how your test results change before and after meals, and from day to day. You can test:

- before a meal. A good range is between 4.4 – 7.2 mmol/l (80 – 130 mg/ dl).
- 2 hours after starting a meal. A good level is less than 10 mmol/l (180 mg/dl).

To test, put a drop of blood from the finger on a test strip and the blood sugar level will show on the glucometer. Depending on the glucometer, instructions may say to put the test strip in the glucometer before adding the drop of blood to the test strip (see below) or the instructions may say to put the drop of blood on the test strip first.



Use a needle or a lancet to get a single drop of blood that goes on the test strip.



For this kind of glucometer, put the test strip in first, then touch the end of the test strip to the drop of blood on your finger.

Some people have glucometers in their home and can test themselves often. Others use a glucometer at a local clinic or with a diabetes support group. Glucometers can be shared among many people safely. But do not share the needles or lancets for drawing blood—they can spread HIV or other illnesses that are carried by blood.

The A1C test (glycosylated hemoglobin test) is only available at a clinic or hospital. This test gives the average blood sugar level for the previous months, so it shows how you are managing your diabetes in general, rather than your level for that day. For most people with diabetes, a good level is less than 8.0%. If this test is available, try to get it done once or twice a year.

Your health worker or diabetes program might use slightly different numbers for your personal situation. The important thing is for you to understand your body, what affects your blood sugar level, and what level makes you feel your best.

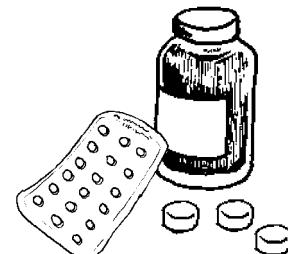


Medicines for diabetes

Medicines cannot cure diabetes. But some medicines can lower blood sugar levels. So can some plant medicines.

Most people start managing Type 2 diabetes without medicines. Healthy eating, exercise, and plant medicines are often enough to lower blood sugar levels so a person stays healthy.

If healthy eating, more exercise, and plant medicines do not help improve a person's signs, medicines can help keep the blood sugar level from getting too high and prevent new problems from beginning. Sometimes a health worker might have you combine two medicines or, after some time, might change the dose or which medicines you use.



Medicines have to be taken regularly and at the right times. Make sure family members also understand the common side effects of your medicines (see pages 33 to 40) and what to do in case of an emergency (see pages 30 to 32). And remember: medicines are only one part of self-care. You still have to eat healthy foods and remain active when taking diabetes medicines.

Metformin

Metformin (see page 33) is a very common diabetes medicine and is the best choice for many people. Metformin is usually taken 2 times a day.

When you start metformin, it may cause stomach upset and diarrhea. This usually goes away in 1 to 2 weeks and can often be avoided by taking metformin with a meal. If the side effects get too bad or do not get better with time, your health worker might stop the medicine or reduce the dose.

People with kidney or liver disease should not use metformin.

Sulfonylureas

Sulfonylurea medicines (see page 34), such as glibenclamide, glipizide, and tolbutamide, are usually taken 1 to 2 times a day before meals.

The danger with sulfonylureas is that they can cause blood sugar levels to drop too low, causing dizziness, weakness, fainting, tremors, sweating, or even death (see page 31). If any of these signs begin, eat something sweet quickly to raise your blood sugar. Make sure family members also know the signs and what to do to help.

To prevent blood sugar getting too low while on sulfonylureas:

- do not miss meals. If you have not eaten, do not take the sulfonylurea medicine.
- eat protein foods or other nutritious foods for breakfast.
- eat extra food when doing physical work, exercise, or sports.
- keep fruit juice, sweets, or sugar with you in case you start to feel weak or dizzy.

If blood sugar gets low too often, your health worker might stop the medicine or reduce the dose.

Another possible side effect of sulfonylureas is weight gain. You may need to pay more attention to diet and exercise, or switch to metformin or insulin. After a person has taken sulfonylureas for many years they may not work as well to keep sugar levels low enough. If this happens, talk to a health worker.

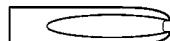
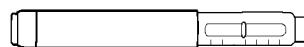
Insulin

Insulin (see page 39) is given by injection. It is the fastest way to lower blood sugar. Injecting insulin can be scary at first, but people learn how to do it and get used to it. People with Type 1 diabetes need insulin to live.

Insulin is a hormone that your body makes to keep blood sugar levels in a good range. People with Type 1 diabetes do not make any insulin. People with Type 2 do not make enough. There are many myths about insulin. Insulin does not cause blindness, does not make diabetes worse, and does not create dependency once you start taking it. Insulin lets you manage your diabetes and live a healthy life.



Most people use a syringe to inject insulin



Insulin also comes in special 'pens' where a needle is attached for each injection. These are easier to use but are more expensive

There are different types of insulin. Long acting insulins are used once or twice a day to keep blood sugar at a good level day and night. Short acting insulins are used before meals so that the food you eat does not raise your blood sugar level too much. See page 39.

One danger of insulin is that it can lower blood sugar levels too much (see page 31). A person can become confused, dizzy, lose consciousness, and can even die from too much insulin. Prevent low sugar levels in the same way as for sulfonylureas by trying not to miss meals and carrying sweets with you for emergencies (see page 20).

If you take insulin, a home blood sugar meter (glucometer) helps you monitor sugar levels to make sure they do not get too low. If you have no meter, it is best to use a lower insulin dose to prevent blood sugar levels from getting dangerously low. Without a way to check, having the blood sugar level be a little too high is safer than too low.

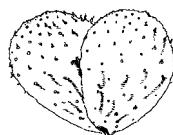
Insulin must be kept cool. If there is no refrigerator, keep it in a bowl of cool water and out of the sun.

Plant medicines lower blood sugar

All over the world, healers have found foods and plant medicines that can help reduce blood sugar.

Ask local healers what plant medicines are available in your area for lowering blood sugar, the best way to use them, and if they are safe to use while also using insulin or other medicines.

- Bitter melon
- Cinnamon
- Bitter leaf
- Moringa leaf
- Nopal
- Mulberry leaf
- Mate tea



- Fenugreek
- Vinegar
- Berberine
- Turmeric
- Ginger root
- Gymnema



Prevent and Manage Complications from Diabetes

Take care of your feet

Good foot care is one of the most important concerns for people with diabetes. Nerve damage caused by diabetes can lead to loss of feeling (numbness) in the feet, making it hard to feel injuries. Diabetes also makes it harder for wounds to heal, easily leading to infection. Fungus on the feet (see Skin problems, in development) can also lead to infection.

A foot infection can spread to the whole leg if not treated. The leg may become so infected that a part of it needs to be removed (amputated). But good foot care and managing your blood sugar levels can prevent amputations.

Check your feet daily

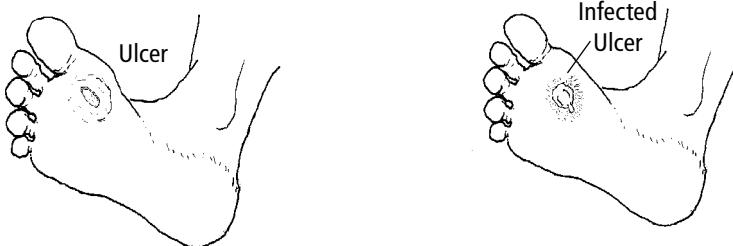
It is hard to notice an injury that you cannot feel. So if you notice parts of your foot are becoming numb, be sure to check your feet by sight and touch every day. If you cannot do it by yourself, have someone help you. Some people use a mirror to see the bottom of their foot. Look for blisters, redness, cuts, or sores. Feel for warm or swollen areas, which can be early signs of infection. Make sure to also check between the toes.

Seek medical care for any wounds that do not heal or areas that stay red, warm, or swollen. It is important to treat wounds early to avoid serious complications.



Care for foot injuries

Keep injured areas clean and dry. Stay off the foot as much as possible. Use crutches for walking to lessen the pressure on the sores.



Clean sores with clean water or an antiseptic. Remove any dead tissue. (Dead tissue will feel cool to the touch and be darker in color.) Soaking the foot in warm (not hot) water can help remove dead tissue. Apply an antibiotic ointment and cover the sore with gauze or a clean, soft cloth. Put padding over it.

Watch for signs of infection, such as swelling, hardness, heat, or red lines going up from the wound. Treat infections with an antibiotic such as tetracycline, doxycycline, penicillin, or metronidazole (see First aid, antibiotics pages 60, 66 and 69).

If sores do not heal with self-care and rest, get medical help.

Prevent foot injuries

Wear shoes or sandals, even indoors. You might step on something sharp and not feel it.

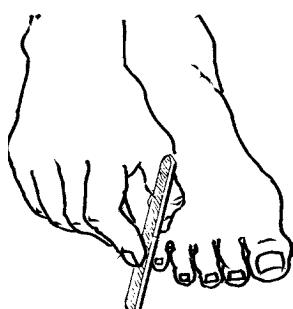
Wash feet daily and pat dry. Always dry between the toes.

Always check inside shoes with your hands to make sure there is nothing sharp or rough inside before putting them on. Anything rough should be padded or clipped away.



Toenails

An ingrown toenail can cut into the skin and cause infection. If a toenail is becoming ingrown, wedge a piece of wet cotton under the corner of the nail to help lift it out. Trim toenails straight across, being careful not to injure the toe, or use a file to keep them from becoming too long. Cutting them straight across instead of on a curve can help avoid ingrown toenails.



Check blood pressure

Everyone with diabetes should be checked for high blood pressure and everyone with high blood pressure should be checked for diabetes. Like diabetes, high blood pressure causes damage to the heart, blood vessels, kidneys, and other parts of the body. So if you have both diabetes and high blood pressure, the chances of developing heart disease, stroke, kidney disease, or other serious problems are greater than having either diabetes or high blood pressure alone.

A normal blood pressure is less than 140/90 mmHg (see Heart Disease, in development). If blood pressure is high, try to lower it by increasing physical activity, reducing stress, and eating healthier food. These same changes help both diabetes and high blood pressure.

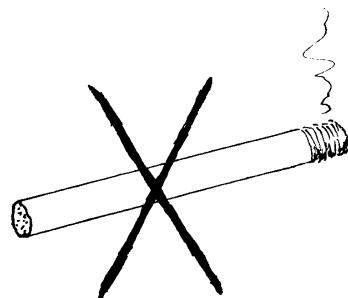
Medicines called ACE Inhibitors lower blood pressure and may protect against kidney failure. Another group of medicines called statins helps reduce the amount of cholesterol in the blood, to make heart problems or a stroke less likely for people with diabetes. For more on medicines that lower blood pressure and cholesterol medicines, see Heart Disease (in development).



Eating well to manage diabetes will also help prevent high blood pressure. Eating less salt helps keep blood pressure at a good level.

Stop smoking

People who smoke get diabetes more often, and people with diabetes who smoke have more serious health problems than those who do not smoke. Smoking tobacco damages more parts of the body than just the lungs. It blocks blood flow and raises blood pressure. Smoking is so harmful for people with diabetes that stopping smoking is even more important than lowering the sugar level in your blood. See Drugs, Alcohol, and Tobacco (in development) for help with how to stop smoking.



Vision

When blood sugar levels go too high, diabetes can cause blurred vision. This will usually clear up when the blood sugars have returned to normal. However, diabetes can also cause more permanent damage to the blood vessels in the eyes, leading to gradual loss of vision or blindness. A person with diabetes should have their eyes tested once a year or more often if they already have some damage to their eyes. If damage to the blood vessels in the eye is detected early, it can be treated by an eye specialist (ophthalmologist) to prevent loss of vision.



Mouth care

Diabetes worsens gum infections which, in turn, makes diabetes worse. People with diabetes should brush their teeth at least twice a day with a toothbrush and fluoride toothpaste or a chewstick (miswak, neem stick). If toothpicks or floss are available, use them to clean between the teeth. For more on how to prevent gum infections, see Teeth, Gums and Mouth (in development).



A person with diabetes will benefit from seeing a dentist. Always let the dentist know if you have diabetes.

Vaccines

People with diabetes should get regular vaccines to prevent diseases such as influenza and pneumonia, which can be more severe if you have diabetes.

Diabetes as a Second Chance

Diabetes is a serious disease but it is manageable. Managing diabetes gives people an opportunity to make positive changes so they can live a healthy, active, and productive life.

Without knowledge of how to take care of your diabetes, life can be very hard. But with support and knowledge, people can become healthier than they were before. Because their health depends on it, they may take on other issues in their lives and communities. They might fight for healthier food, fairer wages, stopping chemical pollution, making it safer to walk, or other things that help them be more active, eat better, and lower the stress in their lives.

You can live with diabetes

People with diabetes have to change the way they eat and live. Here is some advice to help you make changes:

- **Start with small changes.** For example, instead of stopping sugar drinks all at once, try cutting back over time. Slowly reducing the amount of sugar you eat or increasing the amount of exercise you do is easier to manage and you will be more likely to stick with it.
- **Decide for yourself what you want to change.** Set a goal like walking more, smoking less or not at all, or being able to play with your grandchildren.
- **Find support.** Family, friends, or other people with diabetes can help you make changes. Diabetes groups and classes can connect people with diabetes to support each other.
- **Find help for hard feelings.** It is normal for people with diabetes to fear the future, to be sad about the loss of health, or angry about needed changes. Feelings of sadness, depression, or hopelessness can stop a person with diabetes from making changes he needs or wants to make. It can be helpful to talk about these emotions and learn ways to feel better. For more on depression, see Mental Health (in development).
- **Find your reasons for wanting to be healthier.** What do you want to do and how do you want to feel better? For example, think of your family and why you want to be alive and healthy to help them long into the future. Positive goals help you make changes and keep going.



Community Action for Diabetes

While individual people get diabetes and can make changes to improve their health, the changes that can prevent more and more people from getting diabetes can only be made at the community level. For example, one person can choose what kinds of foods to put in her mouth, but her choices are limited by what kinds of foods are available and affordable in her community. One person can want to exercise more, but she cannot choose if her neighborhood is safe enough to do so. It is best to bring families and communities together to change the conditions that cause diabetes or make diabetes worse.

Protect babies and children

To prevent diabetes, feed mothers and children well. Give enough nutritious food to boys and girls. Children malnourished in the womb or in childhood are more likely to get diabetes later. Avoid giving children sugar, sweets, or other junk foods.

Improve access to healthy foods

To increase the variety, amount, and affordability of healthy foods in your community:

- **Hold cooking classes** to teach about healthy eating. When people see that healthy foods taste good and learn how to prepare them, they will want to eat them.
- **Pass along** the healthy food traditions of your culture. When favorite traditional foods are unhealthy, it is best to limit how much we eat of them. Choose the healthier ones and ask elders in your community to share their recipes.
- **Use schools** to involve children in growing, cooking, and eating healthy foods. Snacks given at schools can be made from local grains, fruits, and vegetables. Stop the sale of junk foods and sugary drinks to children in and near schools.
- **Establish community kitchens** where people without a place to cook can prepare food. Healthy low-cost group meals are another solution.
- **Build a community garden** where people can grow their own food. Even growing a little food can make a difference in how you eat. Some people in cities grow food on rooftops, balconies or in vacant lots.
- **Organize farmers markets or food cooperatives** to ensure people have access to healthy foods and that farmers have a place to sell their crops. For more on community food projects, see *A Community Guide to Environmental Health*.



Create places to exercise and play

In urban areas, people may not have safe places where they can be active. Communities have come together to build football fields, basketball courts, and playgrounds. These areas often become community gathering places.

Lead community education

Teach what diabetes is, where it comes from, the severe problems it can cause, and why to take it seriously even if signs are not severe at the beginning. Encourage people to tell their stories about diabetes, share their knowledge, and ask questions. They might plan to eat healthier food or exercise together.

Other topics for discussion and action might include water and air pollution, racism, and the economic or political conditions that create stress in the community.



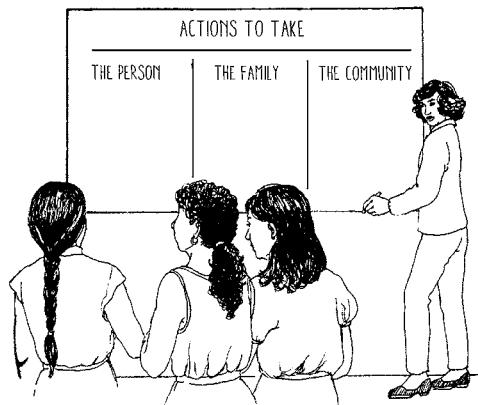
Organize group testing

Diabetes testing days are a good way for people to find out if they have diabetes, even if they do not have signs. Test people who have the warning signs listed on page 2 or who are older than 40 and have family members with diabetes (see page 10).

For testing large groups of people, urine tests may be easiest. Blood tests are also useful but should be done when the person has not yet eaten that day, ideally in the morning before breakfast. To take a urine test, a person does not have to be fasting, but the tester should write down the time of test and when the person last ate, as sugars go up after eating. For more on testing, see pages 10 to 12.

How health workers help

A community health worker can help individuals one by one, but also make a big difference by gathering people to learn together, to make health changes together, and to make changes in the community. Through ongoing support groups (see below), community health workers can help people with diabetes and their families share information about the disease, guide people to find help in the health system, and support each other to make changes or take their medicines. Health workers can help people learn more about diabetes and what treatments and programs are available. Health workers can organize testing for diabetes, expose myths and calm fears people may have about diabetes, and prevent diabetes through community action.



Support groups

A support group is a group of people who meet regularly (like once every week or two) to help each other. A support group can start in a neighborhood, a school, a church, or a workplace—wherever a group of people want to start one. Sometimes a community health worker, clinic worker, or teacher will start and participate in the group. Other groups ask such people to meet with them only sometimes.

People with diabetes meet together to share ways they have learned to care for themselves, discuss things that are difficult, and gain a sense of community. People who just found out they have diabetes can benefit from meeting with people who have been living with diabetes for a while. Support groups can discuss the challenges of cooking and eating together as a family now that one person needs to change what she eats in order to stay healthy. And the group can take on projects to make the community healthier for everyone. A support group can continue and grow for many years if participants find it helpful.



Other community efforts

- Urge health care officials to offer free testing for people who might have diabetes and to make sure medicines and diabetes testing supplies are available and affordable.
- Fight for safe water in order to spend less on water sold in bottles or beverages that are unhealthy.
- Stop chemical pollution at the source.
- Reduce the use of pesticides.



Moving Together in Ecuador

In the South American country of Ecuador, the government started a big campaign in 2012 to get everyone moving. The “Exercise Ecuador” organizers decided that any public park, school yard, or community center could be a place for people to come together, have fun, and get moving. The government trained young people and paid them to lead others in dancing and moving together to lively music. Cities and communities



located places where people could go to dance or exercise together at no cost during a lunch break or going to or from work or school. The program makes it easy for people of all ages to participate and helps pregnant women and disabled people be involved too.

Diabetic Emergencies

There are 2 kinds of emergencies that can happen to people with diabetes. An emergency from low blood sugar (hypoglycemia) happens to a person who knows he has diabetes and is taking medicine or insulin to treat it. This emergency is caused by either too much medicine or insulin or by eating less than normal. A low blood sugar emergency can happen suddenly without warning, but acting fast can help the person recover.

An emergency from high blood sugar (hyperglycemia) usually happens after the person has been having warning signs even if the person does not know he has diabetes.

If you have diabetes, wear a medical bracelet or carry a card with you to show: "I have diabetes." Put the name of any medicine you take on the card or bracelet too. This will help others to help you if you are unable to help yourself. Teach family members and others about the danger signs and what to do.

If someone is having a problem due to diabetes but you are not sure if the problem is from low blood sugar or high blood sugar, treat as if it is low blood sugar (give a small amount of sugar) on the way to get medical help.

Low blood sugar (**hypoglycemia**)

This condition can only happen to a person treating his diabetes with medicines. A person's blood sugar can drop too low if he has taken too much insulin or another diabetes medication, does not eat enough food, does too much physical activity all at once, waits too long between meals, or drinks alcohol. If a person has had problems with low blood sugar, help him find a better way to manage his medicine. Eating more often or more healthy foods can prevent these emergencies.

Someone with low blood sugar may first feel nervous, sweaty, or shaky, then suddenly become clumsy, confused, nervous, or irritable. With the first signs, he must eat right away. If he does not, his condition will worsen. Look for these danger signs:

DANGER SIGNS

- Difficulty walking
- Feeling weak
- Trouble seeing clearly
- Confusion or acting strangely (you may mistake him for being drunk)
- Loss of consciousness
- Seizures

TREATMENT

If he is conscious, quickly give him sugar: fruit juice, candy, or a glass of water with several spoons of sugar in it will all work. He should eat a full meal soon after as well. If you can measure blood sugar with a glucometer, you will know if the treatment is working. If he is still confused or does not begin to feel better 15 minutes after you have given sugar, get help.

If he is unconscious, place a pinch of sugar or honey under his tongue. Keep giving small amounts. It takes time for the body to absorb sugar. When he wakes up you can give him more. Have someone stay nearby for 3 or 4 hours to make sure the danger signs do not return.

High blood sugar (hyperglycemia)

A person with diabetes can have too much sugar in his blood if he eats too much food, is less active than usual, has a serious illness or infection, does not take his diabetes medicine, or gets dehydrated. This can happen even if a person does not yet know he has diabetes. Before there is an emergency from high blood sugar, these signs may mean the person has diabetes or their diabetes needs a different treatment:

SIGNS

- Feeling thirsty and drinking a lot
- Frequent urination
- Blurred vision
- Weight loss

If you do not treat high blood sugar, it can become very dangerous and can lead to coma or even death. You can save a person's life by getting help for these more dangerous signs:

DANGER SIGNS

- Fast heart rate
- Fruity odor on breath
- Dry skin
- Abdominal pain, nausea, vomiting
- Low blood pressure
- Confusion
- Fast, deep breathing
- Loss of consciousness

TREATMENT

Take a person with these danger signs to a medical center immediately. If he is conscious, give him plenty of water to drink, a little at a time.

If you are certain he has high blood sugar, have already tested his blood sugar with a glucometer, and know his insulin dose, give a small amount of insulin on the way to help. But if you are not certain the problem is high blood sugar, do not give insulin. Giving someone insulin when they have low blood sugar can kill them.

Diabetes: Medicines

Oral Medicines for Type 2 Diabetes

Metformin

Metformin is a diabetes drug that helps the body's insulin work better and decreases sugar production in the liver. It works well for people with Type 2 diabetes who cannot control their diabetes enough with changes in eating and physical activity but is not used for people with Type 1 diabetes. It is less expensive than other diabetes medicines, will not cause blood sugar to drop too low (hypoglycemia), and does not cause weight gain. Metformin is sometimes given along with other diabetes medications (sulfonylureas or insulin).

Side effects

Diarrhea, nausea, stomach cramping, gas, and a metallic taste in the mouth. Taking metformin with food will help prevent these side effects. They are usually mild and go away after 1 or 2 weeks after the medicine is started or the dose is increased. If side effects continue, try a lower dose or different medicine.

Important!

Someone who is dehydrated or has a severe infection should stop taking metformin until they are better.

People with kidney problems should have a blood test to check kidney function before starting metformin. People with mild kidney disease should be on a low dose of metformin (no more than 1000 mg per day). People with severe kidney disease should not take metformin.

People with severe heart problems, liver disease, or who have more than one alcohol drink most days, should not take metformin.

A person with Type 2 diabetes having surgery or x-rays that use dye might be told to stop taking metformin for 1 day before and 2 days after. This is done to prevent a rare but dangerous condition called lactic acidosis.

How to use

For anyone taking diabetes medicines, testing a drop of blood to measure blood sugar (see pages 18 to 19) can show how well the medicine, or a specific dose of the medicine, is working. Usually, a person starts with a low dose and then the dose is increased little by little. So more tests than usual are done when starting a new diabetes drug to help find the dose that works best.

Metformin comes in 500, 850, or 1000 mg tablets, and should be taken with meals.

→ For adults, usually the person starts with 500 mg 1 time a day, with the evening meal. If blood sugar levels are still high, the dose can be increased starting the following week by using a tablet with more medicine or by taking it more than 1 time a day.

For example:

week 1: Take 500 mg OR

Take $\frac{1}{2}$ of a 850 mg tablet every night

week 2: To take 850 mg each day, take $\frac{1}{2}$ of a 850 mg tablet with the morning meal and $\frac{1}{2}$ of a 850 mg tablet with the evening meal OR

To take 1000 mg each day, take 500 mg with the morning meal and 500 mg with the evening meal each day

For most adults, metformin works well when they take 1000 to 2000 mg total each day, half with the morning meal and half with the evening meal.

It is also possible to take metformin 3 times a day (with the morning, midday, and evening meals).

For example: To take a total of 1500 mg in a day, take 500 mg with each meal, 3 times each day

More than 2000 mg per day usually doesn't help.

Never give more than 2550 mg per day.

When metformin is used by a child, a doctor or experienced health worker should determine and monitor the dose.

Other medicines that may work

Sulfonylureas and insulin are medicines that are sometimes used instead of or together with metformin.

Sulfonylureas

Sulfonylureas are a varied group of drugs for people with Type 2 diabetes. They help the pancreas make more insulin and help the body use insulin better. Short-acting sulfonylureas lower blood sugar quickly but need to be taken two times each day. Long-acting sulfonylureas work more slowly but last longer in the body, so unless you need a higher dose, it is usually taken 1 time each day.

Sulfonylureas can be used alone or combined with other diabetes medications (metformin or insulin) to better control blood sugar levels. They may become less effective when someone has had Type 2 diabetes for a long time.

Side effects



Sulfonylureas can make the blood sugar go too low too quickly (see Hypoglycemia on page 31), especially if someone does not eat after taking this medicine or is more active than usual. This danger is more likely with long-acting sulfonylureas like glibenclamide (glyburide) and chlorpropamide since they last longer in the body.

- Increased appetite and weight gain are possible side effects. Eating well and getting enough activity can help prevent this.
- Drinking alcohol when using sulfonylureas, especially chlorpropamide, can sometimes cause vomiting.
- For some people, sulfonylureas causes skin rash or increased sensitivity to sun.

Important!

People with kidney or liver disease, or who have more than one alcohol drink most days, should use sulfonylureas with caution.

For older people (over 65 years old) or people with kidney disease, it is safer to use short-acting sulfonylureas, such as glipizide, and start at the lowest dose, to prevent blood sugars from going too low.

Sulfonylureas cannot be used by people with Type 1 diabetes or by people with allergies to sulfa drugs.

Except for glibenclamide (glyburide), pregnant women should avoid using sulfonylureas unless there is no other diabetes medicine available.

Children with Type 2 diabetes usually are not given sulfonylureas.

Signs of taking too much

The danger signs of low blood sugar include difficulty walking, feeling weak, difficulty seeing, confusion, loss of consciousness, or seizures. If the person is conscious, give them something sweet quickly and a full meal as soon as possible. If unconscious, place a pinch of sugar or honey under his tongue and keep giving small amounts until he wakes up and can eat by himself (see page 31).

Interactions with other medicines

Other medicines may not work as well when a person is taking sulfonylureas. And if someone is taking insulin, some sulfonylureas may stop being useful for her. Talk to a health worker about all the medicines you are taking.

How to use



For anyone taking diabetes medicines, testing a drop of blood to measure blood sugar (see pages 18 to 19) can show how well the medicine, or a specific dose of the medicine, is working. Usually, a person starts with a low dose and then the dose is increased little by little. So more tests than usual are done when starting a new drug to help find the dose that works best.

Sulfonylureas medicines are used for adults with Type 2 diabetes.

- Take sulfonylureas 30 minutes before you eat. It is important to always eat after you take this medicine because if you are not taking food, your blood sugar could become dangerously low (see page 31).
- If you are eating well and taking the medicine normally but your blood sugar remains high, talk to your health worker. A change in dose or a different medicine may be needed.
- Sulfonylureas are usually started at the lowest dose and taken 1 time per day before breakfast. The dose is raised very slowly over several weeks if the blood sugar is still high.

Each of the sulfonylurea medicines for adults has different doses. A person starts with a low dose and is tested several days later to see if her blood sugar levels have fallen enough. If she needs a stronger dose, her dose is increased a little. After another week, she is tested again and the dose is adjusted again, if needed. Too high a dose of sulfonylurea is dangerous, so the dose is changed only a small amount each time.

GLIBENCLAMIDE (GLYBURIDE)

Glibenclamide is a long-acting sulfonylurea and usually comes in 1.25 mg, 2.5 mg, and 5 mg tablets.

- ➔ The starting dose is usually between 1.25 and 5 mg, 1 time each day, before the morning meal.

If necessary, the dose can be increased. Most people do well with a dose between 2.5 mg and 10 mg each day. If taking 10 mg or more each day, it is common to divide the daily amount in half and take it 2 times a day, once before the morning meal and once before the evening meal. For example:

- ➔ To take 10 mg each day: take a 5 mg tablet before the morning meal and another 5 mg tablet before the evening meal.
- ➔ To take 15 mg, take 3 of the 2.5 mg tablets with breakfast and another 3 of the 2.5 tablets before the evening meal.

Do not take more than 20 mg in one day.

GLIMEPIRIDE

Glimepiride is a long-acting sulfonylurea and usually comes in 1 mg, 2 mg, and 4 mg tablets.

- ➔ The starting dose is usually between 1 mg and 2 mg, 1 time each day, before the morning meal.

If necessary, the dose can be increased. Most people do well with a dose between 1 mg and 4 mg each day, taken 1 time each day. Do not take more than 8 mg in one day.

GLIPIZIDE

Glipizide is a short-acting sulfonylurea and usually comes in 5 mg, and 10 mg tablets.

- The starting dose is usually 2.5 mg, 1 time each day, before the morning meal. To start with 2.5 mg each day, take 1/2 of a 5 mg tablet.

If necessary, the dose can be increased. Most people do well with a dose between 2.5 mg and 20 mg each day. If taking 10 mg or more each day, it is common to divide the daily amount in half and take it 2 times a day, once before the morning meal and once before the evening meal. For example:

- To take 10 mg each day, take a 5 mg tablet before the morning meal and another 5 mg tablet before the evening meal.

Do not take more than 20 mg in one day.

GLICLAZIDE and GLICLAZIDE MR

Gliclazide comes in 2 forms.

Regular gliclazide usually comes in 80 mg tablets.

- The starting dose is usually between 40 mg and 80 mg, 1 time each day, before the morning meal. To start with 40 mg each day, take ½ of a 80 mg tablet.

If necessary, the dose can be increased. Most people do well with a dose between 40 mg and 240 mg each day. If taking 160 mg or more per day, then it is common to divide the daily amount in half and take it 2 times a day, once before the morning meal and once before the evening meal. For example:

- To take 160 mg each day: take a 80 mg tablet before the morning meal and another 80 mg tablet before the evening meal.

Do not take more than 320 mg in one day.

Gliclazide MR (modified release) comes in 30 mg tablets and has a different dose than regular gliclazide. Usually the person starts with 30 mg of gliclazide MR each day.

If necessary, the dose can be increased. Most people do well with a dose between 30 mg and 120 mg each day, 1 time each day, before the morning meal. If using gliclazide MR, do not take more than 120 mg in one day.

CHLORPROPAMIDE

Chlorpropamide is a long-acting sulfonylurea and usually comes in 100 mg and 250 mg tablets.

- The starting dose is usually between 100 mg and 250 mg, 1 time each day, before the morning meal.

If necessary, the dose can be increased. Most people do well with a dose between 100 mg and 500 mg each day, 1 time each day, before the morning meal.

Do not take more than 750 mg in one day.

TOLAZAMIDE

Tolazamide is a short-acting sulfonylurea and usually comes in 100 mg, 250 mg, and 500 mg tablets.

- The starting dose is usually between 100 mg and 250 mg, 1 time each day, before the morning meal.

If necessary, the dose can be increased. Most people do well with a dose between 100 mg and 1000 mg each day. If taking 500 mg or more each day, it is common to divide the daily amount in half and take it 2 times a day, once before the morning meal and once before the evening meal. For example:

- To take 500 mg each day: take a 250 mg tablet before the morning meal and another 250 mg tablet before the evening meal.
- To take 1000 mg each day: take a 500 mg tablet before the morning meal and another 500 mg tablet before the evening meal.

Do not take more than 1000 mg in one day.

TOLBUTAMIDE

Tolbutamide is a short-acting sulfonylurea and usually comes in 500 mg tablets.

- The starting dose is usually between 1000 mg and 2000 mg. It is common to divide the daily amount in half and take it 2 times a day, once before the morning meal and once before the evening meal. For example:

- To take 1000 mg each day: take a 500 mg tablet before the morning meal and another 500 mg tablet before the evening meal.
- To take 2000 mg each day: take 2 of the 500 mg tablets before the morning meal and another 2 of the 500 mg tablets before the evening meal.

If necessary, the dose can be increased.

Do not take more than 3000 mg in one day.

Injectable Medicine for Diabetes

Insulin

Insulin is a hormone produced in the pancreas that helps the body process sugar in foods. It is necessary for life, and if the body cannot produce it, a chemical form of insulin must be used instead. All people with Type 1 diabetes will need to take insulin for life. People with Type 2 diabetes may also need to use insulin if their own bodies stop producing it. When this happens, oral medicines such as metformin or sulfonylureas are no longer sufficient and insulin may be the only way to manage blood sugar levels.

Insulin must be injected. It may come in a vial, and you can use a syringe to prepare the correct dose. It can also come in a device that looks like a pen which measures the correct dose and is easier to use.

There are 3 types of insulin:

- Short-acting: The most common type of short-acting insulin is called "regular" insulin. Lispro and aspart are also short-acting. This type of insulin is used before meals.
- Long-acting: NPH is the most common long-acting insulin. Glargine and detemir are also long-acting. This type of insulin is used 1 or 2 times a day.
- Mixed dose or pre-mixed: The most common combination of long-acting and short-acting insulins is NPH/regular 70/30, which is used 2 times a day. Another common mixed-dose insulin is NPH/regular 50/50.

Side Effects:



Insulin can make the blood sugar go too low too quickly (see page 31).

Weight gain can be partially prevented by eating well and staying active after starting insulin.

Important!

The risk with insulin is that it will make the blood sugar go too low, which can become a medical emergency (see page 31). This is more likely to occur if someone skips a meal, has had a lot of exercise, or takes too much insulin by mistake.

It is important that the person using insulin understands how to use it safely and can recognize the danger signs of low blood sugar (page 31). If not, she must have adequate help at home. A person with limited vision will also need extra help to make sure she takes the right dose.

If the person uses both long-acting and short-acting insulin, it is very important that she understands the difference between them and uses them correctly.

How to use

Insulin should be kept in a cool place, away from extreme hot or cold. It can be stored in a refrigerator but never freeze insulin.

For anyone taking diabetes medicines, testing a drop of blood to measure blood sugar (see pages 18 to 19) can show how well the medicine, or a specific dose of the medicine, is working. Usually, a person starts with a low dose and then the dose is increased little by little. So more tests than usual are done when starting a new medicine to help find the dose that works best.

FOR TYPE 1 DIABETES

People who have Type 1 diabetes need insulin every day to be healthy. Long-acting insulin is needed to stabilize the person overnight and throughout the day and the person learns how to adjust doses of short-acting insulin depending on meals and when they are active physically. Experienced health workers will help the person and her family determine the types of insulin and the dose that will work best.

FOR TYPE 2 DIABETES

People with Type 2 diabetes often start taking insulin with a once a day injection of long-acting insulin, either alone or in addition to oral medicines like metformin or sulfonylureas.

First doses of long-acting insulin should be low dose, such as 10 units. If you start with a single injection of NPH, it should be given at night. But because NPH only lasts about 12 hours, many people take it 2 times a day to avoid swings in blood sugar.

Your health worker may have you increase the amount of long-acting insulin very slowly over time until the blood sugars are no longer high. Once the blood sugar is in a good range, you continue to take the same dose every day. It can take many weeks to get to the correct dose.

Blood sugars may be at a good level in the morning, but high after meals. If this happens, the person may also need a short-acting insulin, such as regular insulin, given before meals. Short-acting insulin should also be started at a low dose, around 4 units. It can often be started once a day before the largest meal, but for some people it will need to be used before every meal. Regular insulin should be taken 30 minutes before eating. Frequently measuring your blood sugar at first will help your health worker adjust the dose of short-acting insulin you will need.

Mixed dose insulin is another alternative for people who need more than just long-acting insulin. For example, NPH/Regular 70/30 is given 2 times a day, 30 minutes before breakfast and 30 minutes before dinner.

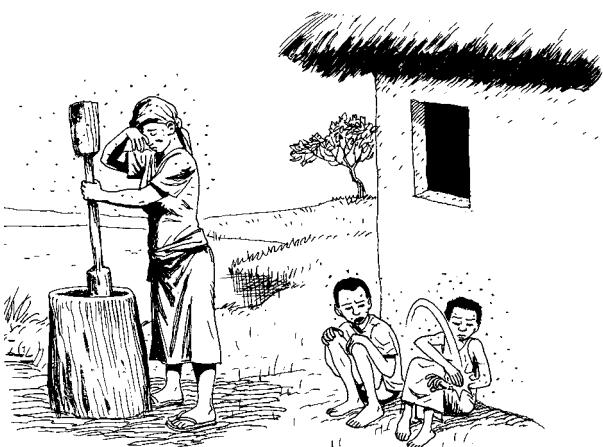
Signs of taking too much

The danger signs of low blood sugar include difficulty walking, feeling weak, difficulty seeing, confusion, loss of consciousness or seizures. If the person is conscious, they need something sweet quickly and then a full meal as soon as possible. If the person is unconscious, place a pinch of sugar or honey under his tongue and keep giving small amounts until he wakes up and can take more himself. See page 31.

Malaria, Dengue, and Other Illnesses from Mosquitoes

Mosquitoes carry many illnesses and spread them to people through their bites. Changes in climate are making weather warmer and wetter, conditions in which mosquitoes thrive.

There are many different types of mosquitoes—some breed in swampy water, others breed in rain water and stored drinking water. Some bite at night and others during the day. Some give illnesses to people only, others can also make animals sick.



Mosquitoes spread illness when they bite

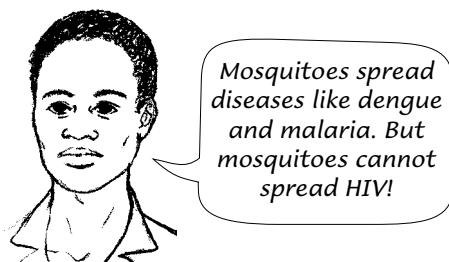
Viruses from mosquitoes. Many illnesses that mosquito bites pass to people are caused by viruses. As with most viruses, once the person recovers, she is immune and will not get that same virus again. But some viruses, like dengue, have slightly different versions (called serotypes), so a person can get dengue more than once. Getting dengue a second time can make the illness more serious.

After many people in a community have already had a virus, they each are immune. Fewer people get sick and the illness seems to go away. But as children are born and people who never had the illness arrive, the virus can affect the community once again. So there may be years with an outbreak of illness and years with very little. This is also why many people get sick at once if a new virus reaches a region where no one has had it.

Parasites from mosquitoes. Malaria comes from very tiny parasites that enter and then stay alive inside the cells in our blood. The parasites get into our blood through an infected mosquito's bite. Once a mosquito passes the malaria parasites to a person's body, they cause illness off and on for many years unless the person takes medicines that kill the parasites. After many years of living where malaria is common, a person will no longer become so ill because his body has developed the ability to fight off the parasites. Pregnant women, babies and young children need protection because they can get malaria more easily and it is more harmful to them.

How illness spreads. Illnesses from mosquitoes do not spread directly between people who live together or touch each other. But mosquitoes can get a virus or parasite by biting a person who has the parasite or virus in his blood and then pass it by biting another person, so family members and neighbors often get sick one after the other. Understanding how a mosquito spreads disease (page 19) will help community members understand how to protect themselves from illnesses carried by mosquitoes.

Although Zika virus is mainly spread by mosquito bites, it can also be spread through sex. Zika is usually a mild illness, but if a pregnant woman gets Zika, it can greatly harm her developing baby. Protect women from Zika by preventing mosquito bites and by using condoms (pages 13 to 14).



Signs of common illnesses spread by mosquitoes



Among the illnesses spread by mosquitoes are malaria, yellow fever, dengue, Zika, chikungunya, West Nile virus, and Japanese encephalitis. There are mild and severe forms of each. These diseases often cause fever, rashes, and aches. It is possible to be infected by more than one virus at the same time. Signs help point to one disease over another, but it is often difficult to tell them apart. Health officials usually know what mosquito illnesses are present in your region.

Which mosquito illness is it?

? Is there fever?

- ➔ First fever, then chills, then fever again. This is common in malaria. Dengue and yellow fever may give chills in addition to fever.
 - ➔ Fever comes on quickly, the head and body aches. Yellow fever, dengue and chikungunya often start this way. Japanese encephalitis can also start with a sudden fever.
 - ➔ The fever from dengue and chikungunya is usually high, 38.5°(101°F) or more. Fever from Zika is usually lower, less than 38.5° (101°F).
 - ➔ Fevers are common to many illnesses. See Examining a Sick Person (in development) to learn more about fever and see the Caring for Children chapter for information on childhood illnesses that cause fevers.
-

? Is there a rash?

- ➔ Rash is very likely with Zika and common with chikungunya, dengue, and West Nile fever. Rash is not likely with malaria, yellow fever, or Japanese encephalitis.
 - ➔ A rash can also be a sign of measles or other common illnesses that are not from mosquitoes.
-

? Are there aches in the bones and joints?

- ➔ Pain and aches in the body are common with dengue, chikungunya, and Zika. Aches are less likely with malaria. Pain felt in the bones or muscles is more likely dengue and painful, swollen joints are more likely to be chikungunya.
 - ➔ Joint pain can also be a sign of other problems that are not from mosquitoes, including viruses spread by ticks.
-

? Are eyes red and irritated?

- ➔ Irritated eyes are common as a sign of Zika and sometimes occur with chikungunya and yellow fever.
-

Danger signs from mosquito illnesses that need emergency help

- Seizures and losing consciousness can result from severe malaria, severe West Nile virus or severe Japanese encephalitis.
- Bleeding inside the body or from the mouth, gums, nose, eyes, or skin can come from severe yellow fever or from severe dengue. Watch for signs of shock: the skin goes cold, blood pressure drops, and the pulse gets fast (see the First Aid chapter, page 11). A swollen stomach could also be a sign of internal bleeding.

If the fever is close to 40° (104°F), see a health worker soon. If it is higher, this is an emergency.

Be sure to see a health worker if you have signs of malaria and are pregnant, if you suspect an illness from mosquitoes in a baby, or there is illness in someone elderly or with serious health problems. If painful aches continue longer than 2 weeks or there is severe weakness, tingling, or no feeling in the legs, arms or face, see a health worker. These could be a sign of Guillain-Barré syndrome, a serious condition that can follow an illness from mosquitoes. It is best treated in a hospital.

Which mosquito illness do you have and what should you do?

Because these illnesses have similar signs, it is difficult to be sure which a person has. If it might be malaria, getting a malaria test without delay allows a person to start malaria medicines quickly, especially important if she is pregnant, very young or old, or has HIV. A woman who might have Zika can delay trying to become pregnant until she is better. Zika during pregnancy can be dangerous (see page 13).

When the illness is mild, treat with rehydration, rest, and paracetamol (acetaminophen), even if you are not sure which illness it is (see page 10). If the person feels worse or is not getting better, check with a health worker.

Informing health workers and regional health officials about who and how many people are sick can help them know when to take community-wide measures to stop the mosquitoes (see the section starting on page 18).

Prevention of illnesses caused by mosquitoes

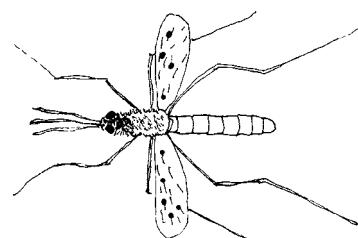
In areas where there is yellow fever (see page 12) or Japanese encephalitis (see page 17), vaccinating children and adults can prevent these diseases. Where insecticides are used to kill mosquitoes, be careful how you use them because insecticides can harm people and the environment (see pages 21 to 22). It may be safer and more effective to prevent mosquito bites (pages 19 and 20) and stop mosquitoes from breeding with other methods (page 23).



To help prevent illness, get rid of places where mosquitoes can breed and keep water containers tightly covered.

Malaria

Malaria is caused by a parasite (called *Plasmodium*) passed to people by mosquitoes (called *Anopheles*) that bite mostly at night. For most cases of regular malaria (called uncomplicated malaria), the cycles of fever and chills are unpleasant but will go away in a few days with treatment. But untreated, malaria can become dangerous quickly. This is called severe malaria. In regions with malaria, people with unexplained fevers should go to a health center to get a blood test. If the test shows malaria, or if testing is not available but health workers think it is malaria, start treatment with medicines right away.



The malaria mosquito may have spotted wings.

Different parasites cause falciparum, vivax, and other malaria types. Health authorities know which types are present where you live and which medicines will work best (pages 29 to 44). Without medicines, malaria can come back many times because the parasites stay in the person's body. Medicines help the person get better by killing the parasites.

Malaria is especially dangerous to babies, children under 5 years old, pregnant women, and people with HIV. When pregnancy or HIV or another illness make it hard for a person's body to fight off infections, getting malaria or developing severe malaria is more likely.

Uncomplicated malaria

A common sign of malaria is a fever that comes and goes, followed each time by chills. Sometimes the person sweats as the fever goes down. However, many cases of malaria do not follow this pattern. The other signs are common but do not affect everyone and are signs of other illnesses too.

SIGNS OF UNCOMPLICATED MALARIA

- Fever can be mild but is often high, 39° (102°F) or more
- Chills and sweats
- Headaches and body aches
- Nausea, vomiting, lack of appetite
- Paleness and weakness from anemia
- Mild jaundice (yellow in the white part of the eyes or skin of a light-colored person)
- Enlarged spleen (a health worker feels this by checking the belly)

A blood test confirms if a person has malaria. Some malaria tests require a microscope but many health workers use rapid test kits that use only a single drop of blood. Because untreated malaria can cause fever and chills several times over a few years, ask if the person has had the same signs in recent months.



Rapid Diagnostic Tests (RDT) test for malaria using a drop of blood. If the person is already taking malaria medicine, the test may not give a correct result.

TREATMENT OF UNCOMPLICATED MALARIA

Start malaria medicine (pages 29-44) as soon as possible after a positive blood test or if you have good reason to suspect malaria and a test is not available. In areas with *P. falciparum* malaria, it is especially important to begin treatment right away. Because mosquitoes pass malaria from person to person, treating a sick person protects others from getting infected.

Find out what medicines for malaria your local health authorities recommend. In many regions, malaria has developed resistance to some older medicines. This means that medicines that once worked to prevent or treat malaria no longer work. Medicines that cure malaria in one region may not cure the malaria found in a different place.

A person with malaria will need to rest and drink clean water, soups, and also rehydration drink if there is fever, vomiting, or diarrhea.

IMPORTANT! Take all of the medicine for all of the days recommended, even if you feel better. If you stop taking the medicine, the malaria may come back and the medicines may no longer work.



The woman who took all of her medicine got better.



The woman who did not finish all her medicine is still sick in bed.

Anemia from malaria during pregnancy and in children

One of the dangers of malaria is that it causes anemia. Tiredness, weakness, and shortness of breath are signs. Anemia damages the blood making it harder for the blood to carry nutrients through the body. Anemia is especially harmful during pregnancy and for small children. Anemia that comes with malaria during pregnancy can cause babies to be born too soon, too small, and can make bleeding during birth more dangerous.

Sometimes malaria causes no fever, chills, or other signs that the person is ill. But if a child or a pregnant woman has anemia and there is malaria in the area, also test for malaria. When anemia is caused by not eating enough foods with iron, then eating these foods will help with the anemia. But if the cause is malaria, it is important to treat the malaria with medicines as soon as possible to prevent the anemia from getting worse and causing more harm.

In areas where there is a lot of malaria, pregnant women can take sulfadoxine + pyrimethamine to prevent malaria. This is often given during the regular health visits during the pregnancy. Do not use during the first 3 months of pregnancy, but after that, give at least 3 times during the pregnancy (see page 36).

SIGNS OF ANEMIA

- Pale gums and inner eyelids
- Weakness
- Tiredness
- Dizziness
- Trouble catching the breath
- Fast heartbeat

A blood test is used to check for anemia.



Severe malaria

Severe malaria can develop when uncomplicated malaria is not treated or not treated soon enough. Severe malaria is more likely when the person's malaria is caused by the parasite "Plasmodium falciparum" (*P. falciparum*). The person with severe malaria needs advanced care in a hospital or clinic. Severe malaria can cause death within 1 or 2 days, especially if it spreads to the brain, a condition called "cerebral malaria."

DANGER SIGNS OF SEVERE MALARIA

- Too weak to sit or stand, cannot stay awake
- Mental confusion, convulsions, or loss of consciousness
- Repeated vomiting, cannot drink or breastfeed
- Rapid breathing or difficulty breathing
- Low blood pressure or other signs of shock (see page 11 of the First Aid chapter).
- Dark urine, and less urine as kidneys begin to fail

Health workers will also test blood and urine for:

- Anemia
- Hemoglobin in the urine
- Low blood sugar (glucose)

TREATMENT OF SEVERE MALARIA

Adults and children with severe malaria need a health worker with advanced training to give artesunate in the vein or injected in the muscle, for 24 hours or more. If the hospital or the person who can give this treatment is not close, a local health worker may have the training and medicines to inject artesunate or quinine to help while you get to a hospital. Artesunate capsules in the rectum are used for children under 6 years old where injected artesunate is not available (see page 38). Emergency treatment does not cure the malaria; you will also need 3 or more days of additional medicines by mouth.

PREVENTION OF MALARIA

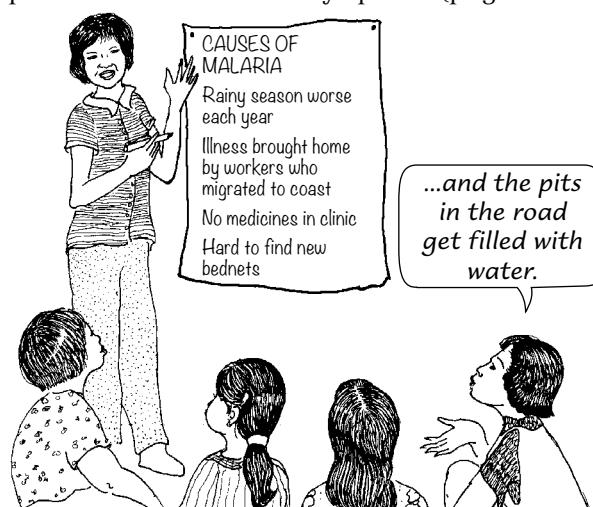
Medicines that treat malaria are sometimes used to prevent it. In some countries, it is important to take medicine once a month to prevent malaria during the last 6 months of pregnancy (see sulfadoxine + pyrimethamine, page 36). In countries where malaria only appears in the rainy season, programs may give malaria prevention medicine to children a few months each year. People traveling to a region with malaria can also prevent it by taking a daily or weekly dose depending on the region and medicine used. Vaccines to prevent malaria are being developed and may become available in the future.

Sleeping under an insecticide-treated bednet is one of the best ways to prevent malaria. These bednets are treated with one or more insecticides, which are relatively safe, especially compared to getting malaria. Learn more about how bednets prevent malaria and other mosquito illness (page 20).

Distributing free insecticide-treated bednets and trained workers spraying insecticides indoors (page 22) can stop malaria when enough homes in the community are involved. You can prevent malaria mosquitoes from breeding or their eggs from hatching (see page 23). Avoiding mosquito bites will always help prevent the diseases they spread (pages 19 and 20).



Malaria mosquitoes bite at night. To prevent malaria, sleep under an insecticide-treated bednet. Cover a baby's cradle with netting too.

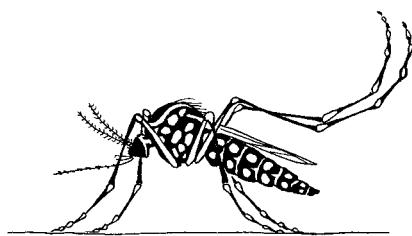


Poverty and injustice allow malaria to spread. If people do not have the means to protect themselves from malaria, they get infected and then others get it through the local mosquitoes. For prevention and treatment campaigns to be successful, bednets, malaria tests, medicines, and safe ways to stop mosquitoes from breeding must be available to all.

Dengue, Yellow Fever, Zika, and Chikungunya

Dengue, yellow fever, Zika, and chikungunya are different diseases, each caused by a different virus. They are spread by black mosquitoes with bands of white or silver-colored dots and striped legs. Two of these are the yellow fever mosquito (*Aedes aegypti*) and the Asian tiger mosquito (*Aedes albopictus*). They usually bite during the day, especially in the early morning and late afternoon, and breed where people store water and anywhere water collects. These mosquitoes live in and close to houses and usually stay in shady, dark places, such as under tables or beds, or in dark corners. It can be hard to tell which virus a person has if Zika, dengue, and chikungunya are all present in your region.

Learn about the most common signs for dengue (page 11), yellow fever (page 12), Zika (page 13), and chikungunya (page 15). Any of these can give fever and body aches. But some people have no signs at all. Unless they have a blood test that shows they had the illness, they may not know they were sick. And even if you have no signs, getting new mosquito bites will spread these diseases to others when the mosquito bites someone else.



These mosquitoes cause many diseases. The legs are striped black and white.

Treatment is similar for dengue, yellow fever, Zika, and chikungunya

Most often these 4 virus illnesses from mosquitoes are treated at home, but for babies, elderly people or people with HIV, or any danger sign including fever over 40° (104°F), see a health worker.

There is no medicine that cures dengue, yellow fever, Zika, or chikungunya. They are all treated with bed rest, drinking plenty of water and other liquids, and taking paracetamol (acetaminophen) to reduce pain and fever (see page 29). Paracetamol is safer to use than aspirin or ibuprofen, which can be dangerous if a person develops severe dengue (see page 11). If a woman might be pregnant, aspirin and ibuprofen could be harmful to her developing baby but paracetamol is safe.

Prevention is the same for dengue, yellow fever, Zika, and chikungunya

To prevent these illnesses, avoid mosquito bites (see page 19) and prevent mosquitoes from breeding (see page 23). There is a vaccine to protect against yellow fever.

Dengue Fever (Breakbone Fever)

Dengue usually occurs during the hot, rainy season. It is common in cities and places where people live close together. The mosquitoes breed where people store water and anywhere water collects, commonly in containers and on the ground where there is poor drainage.

The first time a person gets dengue, she can usually recover with rest and by drinking lots of liquids. When a person gets dengue a second time or any time after that, it is more dangerous.

The illness usually begins with sudden high fever along with body aches. After 3 to 4 days, the person may start to feel better but a rash begins on the hands and feet. The rash spreads to the arms, legs, and body (but usually not the face). Dengue can have other patterns but most people have the high fever and 2 or more of the other signs.

SIGNS OF DENGUE:

- Sudden high fever, 39° (102°F) or higher
- Severe body aches in both the muscles and joints (this is why dengue is sometimes called breakbone fever)
- Headache, pain behind the eyes
- Rash
- Sore throat
- Nausea or vomiting
- Chills
- Extreme tiredness



Treatment (see page 10) can help you feel better. But watch for danger signs of severe dengue. If not treated right away, it can lead to death.

DANGER SIGNS OF SEVERE DENGUE

- Tiny spots of blood on the skin or from the nose, ears, or mouth
- Swollen stomach, or blood in vomit that can be red or brown, or black feces (from bleeding in stomach)
- Unable to eat or drink
- Acts confused, pulse gets fast, the skin goes cold, or other signs of shock. Where a blood test is available, a high hematocrit or low platelets are signs that something is wrong.

Severe dengue can only be treated by giving fluids by IV quickly and treating blood loss. Go to a hospital immediately if there are danger signs.

PREVENTION

Avoid mosquito bites (page 19) and prevent mosquitoes from breeding (page 23).

Yellow Fever

Yellow fever is most common in Africa and South America. People in tropical rain forests can get *jungle* yellow fever, but the most common kind is called *urban* yellow fever.

Most people recover completely from yellow fever and develop immunity, which means they will not get yellow fever again. A small number of people get severe yellow fever, but with treatment they too usually recover.

SIGNS OF YELLOW FEVER

- Fever
- Chills
- Muscle pain (especially backache)
- Headache
- Loss of appetite
- Nausea and vomiting
- Slow pulse
- Eyes sensitive to light
- Redness of skin, eyes, tongue



For most people, the illness goes away after 3 or 4 days.

Treatment (see page 10) can help you feel better. But watch for danger signs.

DANGER SIGNS OF SEVERE YELLOW FEVER

In severe yellow fever, after a few hours or after the first day of feeling better, a high fever returns with some of these signs:

- Jaundice (white part of the eye or light colored skin is yellow)
- Abdominal pain
- Bleeding from the mouth, nose, or eyes
- Vomiting
- Blood in vomit, that can be red or brown, or black feces (from bleeding in the stomach)

If any of these danger signs appear, go to a hospital immediately.

PREVENTION

Vaccination prevents yellow fever (see the Vaccines chapter, page 11). Also avoid mosquito bites (page 19) and prevent mosquitoes from breeding (page 23).

Zika Virus

Zika may cause a mild fever, rash, irritated eyes, and body aches, usually for a few days only. However, most people who get Zika virus have no signs.

SIGNS OF ZIKA

- Low fever for 1 or 2 days, usually not over 38° (101°F)
- Rash
- Irritated or red eyes
- Joint pain
- Itching skin
- Muscle pain and headache

Zika is usually mild and lasts just a few days or up to 1 week. Usually a person with Zika virus is not sick enough to need to go to a hospital.



Treatment (see page 10) can help you feel better.

PREVENTION

To prevent Zika, avoid mosquito bites (page 19) and practice community mosquito control (page 23). While most Zika comes from mosquito bites, it is possible for a man who has had Zika to pass it to a woman through sex. So in regions with Zika, using condoms during sex will help prevent it from spreading.

Zika and pregnancy

Zika can be very dangerous for a baby growing in the womb. Zika can cause babies to be born with a serious condition called microcephaly, where the baby's head is too small. Babies born to women with Zika in pregnancy may die at birth or may have problems developing physically and mentally. Fortunately, most of these babies will have not have problems. But all women, especially women who might be pregnant, should prevent mosquito bites—cover up with clothing, use mosquito repellents, and keep mosquitoes away by using screens and bednets in the home (pages 19 to 20).



If there is a Zika outbreak where you live and you want to get pregnant, you can consider waiting until the outbreak ends. Communities can ensure that birth control is made accessible to all women to limit harm from the Zika virus (see the chapter on Family Planning and the book *Health Actions for Women*).

Because Zika virus can be passed between men and women during sex, where there is Zika, use condoms to prevent passing Zika virus. If the woman is already pregnant, it is especially important that she either avoids sex or that she and her partner use condoms to prevent her from getting Zika while pregnant.

In an area with no Zika from mosquitoes, a woman can still get Zika from sex if her partner has traveled to an area with Zika. He should use condoms for at least 6 months after his return to prevent spreading Zika virus through sex.

No babies have gotten Zika from breast milk. Even if you have had Zika, breastfeeding is the best way to nourish and protect your baby's health.



When a baby is born with birth defects from Zika

The baby born with problems from Zika during pregnancy may have a small head and a small brain. He may develop vision, hearing, or other physical problems and be mentally slow. Health workers check a baby's eyes and vision at 3 months and can also look for problems by comparing the child's abilities and activities to what other children do, using a child development chart (see Appendix A in the chapter Caring for Children). Give the child all of his vaccines and regular care. If the baby is born with a small head or as soon as eye or other problems are noticed, help the family find the government or community programs that offer therapy or other resources they will need to help their child. Children who are developmentally slow need the same stimulation that any child needs from her parents and family, including talking to them, playing games and music, and showing love. But they need more. They need more help and repeated activities to learn to use their minds and their bodies. Hesperian's books *Disabled Village Children* (chapter 34) and *Helping Children Who Are Blind* have more information on helping children with these challenges.



Chikungunya Virus

Although not usually a dangerous disease, chikungunya can be very uncomfortable because of the intense joint pain that can affect the hands, feet, knees, and back. It can be so painful that people stay bent over and cannot walk. Most people feel better within one week, but after the fever goes away, joint pain can last for several more weeks or even months. The pain may return later, even after a year or more.

Chikungunya can be more dangerous for infants. See a health worker if a baby has high fever, seizures, vomiting, or diarrhea.

SIGNS OF CHIKUNGUNYA

- Fever is sudden and can be mild or high, often 38.5° (101°F) or higher
- Intense body aches, headache, neck pain and abdominal pain
- Nausea
- Rash
- Joint pain may continue for weeks or months

Treatment (see page 10) can help you feel better.

PREVENTION

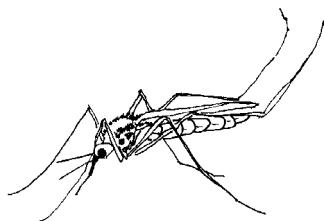
To prevent chikungunya, avoid mosquito bites (page 19) and prevent mosquitoes from breeding (page 23).



The mosquitoes that spread dengue, yellow fever, Zika, and chikungunya do not need much water to lay eggs. A bottle cap filled with water is big enough!



West Nile Virus



This mosquito breeds in swamps or other stagnant or dirty water.

West Nile virus is spread by the *Culex* mosquito. These mosquitoes are medium-sized, brown, and have whitish markings on the abdomen. By day, they rest in and around homes and other structures and near plants and vegetation. Crows, other birds, and horses carry West Nile virus. The mosquito bites an infected animal and then bites a person, passing the virus and the illness.

SIGNS OF WEST NILE VIRUS

Most people infected with West Nile virus do not get signs of illness and may not know they had it. But about 1 in every 5 people infected will feel sick and may have some of these signs:

- Fever
- Headache
- Feeling tired all the time (fatigue)
- Body aches
- Vomiting
- Rash on the body
- Swollen lymph nodes



Treatment (see page 10) can help you feel better.

West Nile virus can become severe, although it is not common. The severe form of the disease affects the brain. Older people are more likely to develop severe West Nile virus than younger people. Get medical help quickly for any danger signs.

DANGER SIGNS OF SEVERE WEST NILE VIRUS

- Neck stiffness
- Tremors (trembling)
- Paralysis (being unable to move)
- Mental confusion or loss of consciousness

PREVENTION

Dead birds and sick horses in a region with West Nile virus are a warning that the illness may start in people. There is a vaccine for horses that prevents West Nile virus; so vaccinating horses protects people too. Also avoid mosquito bites (page 19) and prevent mosquitoes from breeding (page 23).

Japanese Encephalitis

Japanese encephalitis is spread by the *Culex* mosquito. These mosquitoes are medium-sized, brown, and have whitish markings on the abdomen. They usually bite at dusk and after dark. By day, they rest in and around homes and other structures and near plants and vegetation. Japanese encephalitis mostly affects people in Asia and the western Pacific. Most people do not become seriously ill, however severe cases of Japanese encephalitis can damage the brain and even cause death.

SIGNS OF JAPANESE ENCEPHALITIS

A person with Japanese encephalitis may have no signs or may only have signs shared with many other illnesses, such as fever, diarrhea, vomiting, headache, or weakness.

Treatment (see page 10) can help you feel better. But take a person with any danger signs to a hospital quickly.

DANGER SIGNS OF SEVERE JAPANESE ENCEPHALITIS

- Seizures
- Paralysis (being unable to move)
- Mental confusion or loss of consciousness

PREVENTION

Vaccination prevents Japanese encephalitis. Also avoid mosquito bites (page 19) and prevent mosquitoes from breeding (page 23).

Elephantiasis (lymphatic filariasis)

Elephantiasis is caused by tiny worms that are spread by mosquitoes (the worm is called “filariasis”). Usually there are no signs until many years after infection. Where elephantiasis is a problem, the best way to prevent its spread is giving medicines to treat people who already have it. The medicines kill the parasites inside the person, so mosquitoes can't spread them to others. Different mosquito types can carry the illness. Preventing mosquitoes from biting (page 19) and breeding (page 23) help keep it away.

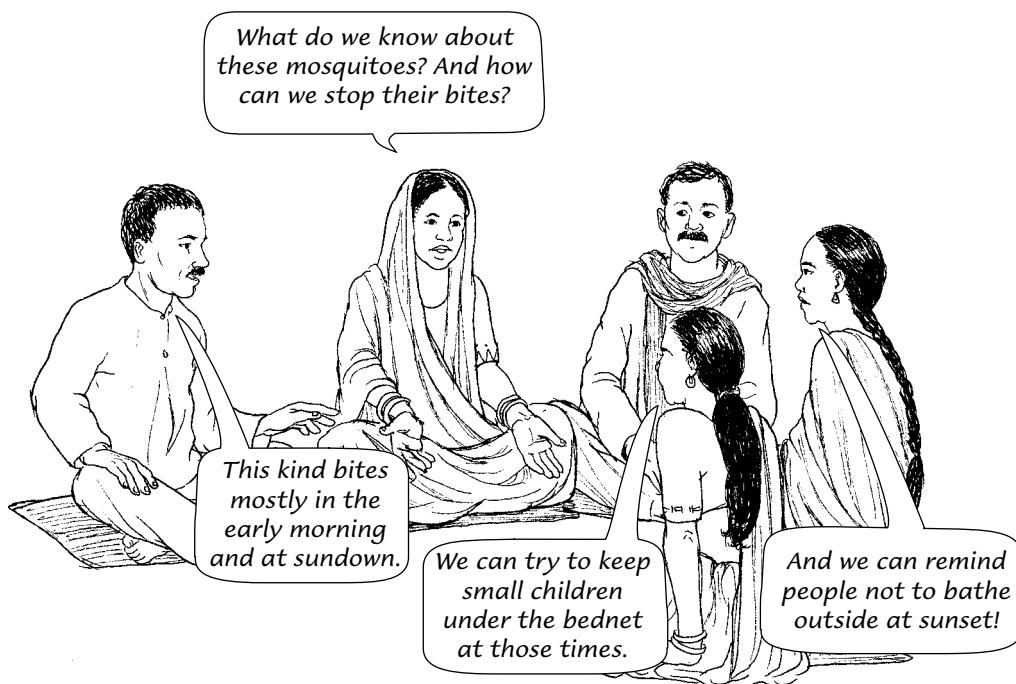
Signs of elephantiasis develop after an infected person has had it a long time. They include swelling of legs and arms, and in men, the scrotum. There are attacks with fever and severe pain.

Treatment includes antibiotic and anti-parasitic medicines to kill the parasites and stop the disease from getting worse. Pain relievers help reduce pain and fever. Sometimes a swollen part of the body can be treated with surgery. Talk to a health worker to get the medicines you need and learn exercises and other ways to help swollen legs and other problems.

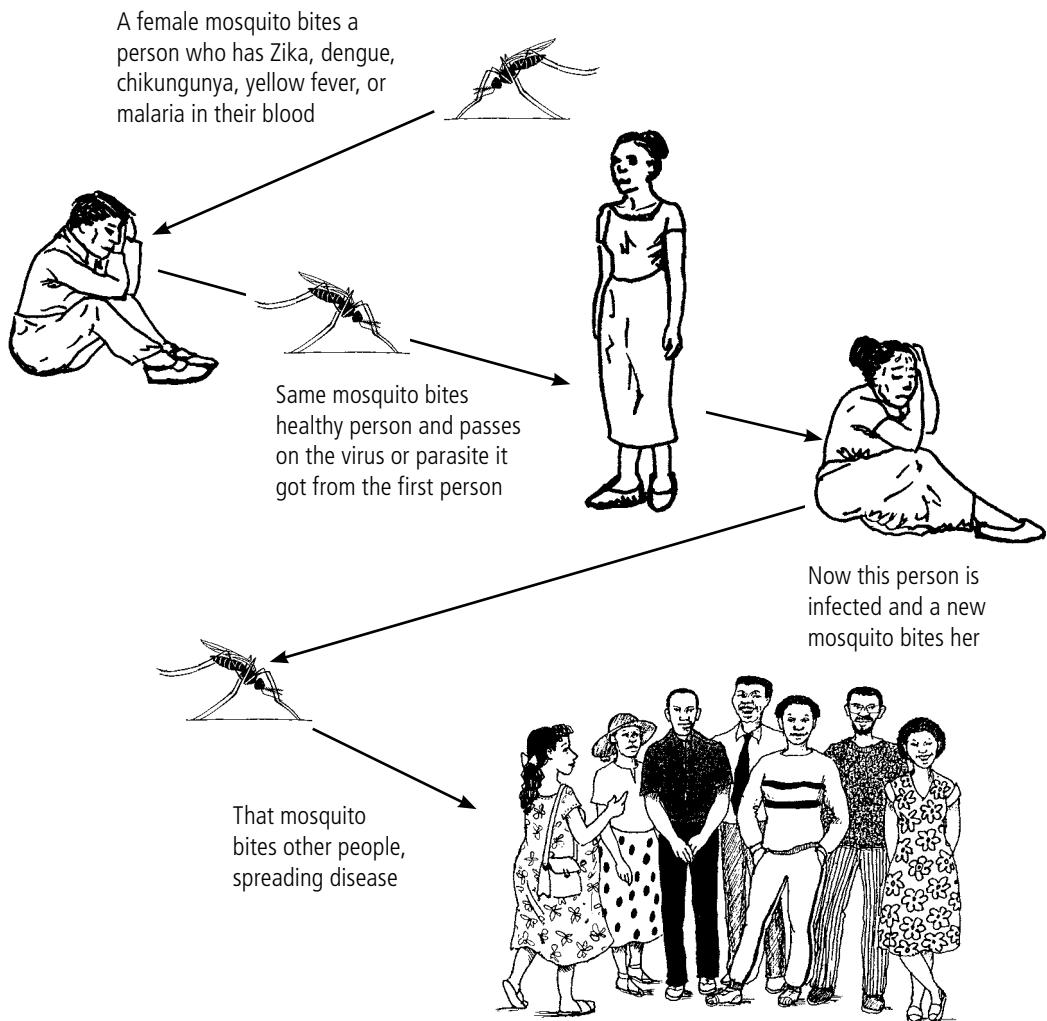
Prevent Illness by Stopping Mosquitoes

You can stop illnesses carried by mosquitoes by preventing mosquito bites and preventing mosquitoes from breeding in the home and in the community.

To do this, you must know where different kinds of mosquitoes like to breed, where they like to rest, and when they bite. For example, malaria mosquitoes are most common in rural areas, and often breed in swamps and other still water. The dengue and yellow fever mosquitoes stay inside or near houses, where clean water collects or is stored, both in rural areas and in cities. In the house, many mosquitoes hide in shady, dark places, such as under tables or beds, or in corners. Outside, they find shady areas.



How mosquitoes spread disease



Avoid mosquito bites

- Wear clothes that cover the arms, legs, feet, neck, and head as much as possible (long sleeves and long pants or skirts, a head covering and closed shoes, or socks with sandals).
- Use wire mesh (screens) on windows, doors, and vents. Fill in any gaps around the windows and repair holes in the screens.
- With no screens, close doors and windows when mosquitoes are out.
- The moving air from a fan can keep mosquitos away.
- Use bednets at night and if resting during the day.
- Use a net to protect you from mosquitoes when sleeping outdoors.

Bednets help stop mosquito bites

Bednets prevent mosquito illness in 2 ways. A bednet with no holes or openings keeps the mosquito from reaching someone under the net. And a bednet treated with insecticide kills the mosquitoes that land on the net. To lower the number of mosquitoes bringing illness to the community, use one for each bed in every home. Programs give away insecticide-treated bednets because when everyone uses them, mosquitoes are fewer and there is less malaria.

To keep mosquitoes from biting, always tuck the edges of the nets under the bed or sleeping mat so there are no openings. Bednets only work if holes or tears are quickly repaired.

Bednets that come treated with insecticide are meant to be long-lasting, which means that the insecticide can work well for a year or even a few years. If you buy or are given a bednet, find out how long the insecticide is meant to last and if washing the net too much makes it less effective.

With older bednets, the insecticide will eventually wear off. If the bednet is still in good condition, you can mix and apply new insecticide, but if the bednet has many rips or tears it is safer to replace it. When reapplying insecticide to the bednet, wear gloves and pay careful attention to the directions to stop the chemicals from getting on or inside your body.

For any bednet treated with insecticides, do not let children suck or chew on them and do not wash them in a river or water where the insecticide can harm fish, insects, animals, and people downstream.



The malaria mosquito mostly bites at night, making bednets especially helpful in preventing malaria and any other illness caused by the same mosquitoes. The mosquitoes that carry dengue, yellow fever, Zika, and chikungunya bite during the day. For small children or others sleeping or resting during the day, bednets will help prevent these illnesses too. Also, bednets will keep those who are already ill from being bitten by a mosquito that could then give the illness to others.

Repellents and insecticides stop mosquito bites

Repellents are chemicals that mosquitoes do not like, so they stay away. Insecticides are chemicals that kill mosquitoes after they land on an insecticide-treated surface, such as a wall or bednet.

- For your skin, use natural repellents like citronella, neem oil, concentrate from lemongrass or basil leaf. Or use chemical repellents that have one of these ingredients: DEET, Picardin (KBR 3023, icaridin), IR3535, or PMD and other oil of lemon eucalyptus compounds. Repellents can be especially useful protecting children but read the label carefully to make sure the product is safe for children. The label will also say how often to reapply, usually every few hours.
- Where there is Zika, health authorities may provide repellents to women because Zika can harm a woman's pregnancy (see page 13).
- Permethrin is a chemical that should not be applied to the skin but can be sprayed on bednets, clothes or shoes to keep mosquitoes away. To keep the chemical off your skin, spray the clothes and let them dry before you put them on. Follow the instructions on the label.
- Only use mosquito coils until you can find a better repellent. The smoke from the mosquito coils and other methods to create smoke to repel mosquitoes can harm your breathing.

Spraying insecticides to kill mosquitoes

Governments or other organizations may carry out programs to kill mosquitoes by spraying insecticides on inside walls at the time of year when there are most mosquitoes. This is called IRS or Indoor Residual Spraying. Anyone applying insecticides needs protection to prevent the insecticides from getting in the body by breathing or by touching the mouth or skin.



To stop malaria, this kind of spraying works best when all houses in the same area are sprayed. As with all chemicals including insecticides, keep children from getting the chemicals in their mouths or on their body.

Insecticides kill mosquitoes but can harm people

Insecticides are poisons—that is why they kill mosquitoes. Almost all insecticides also harm people. That is why the best methods of mosquito control are community efforts that take away places where mosquitoes can breed. If those efforts are not enough and insecticides are used to kill mosquitoes, there are ways to reduce their harm to people:

- Make sure the insecticide you use is one that will kill the mosquitoes in your area. There are places where the mosquitoes have become resistant to some insecticides. This means that the insecticide no longer kills the mosquitoes.
- Use the least dangerous insecticide available, and use the least amount necessary. Read the directions on how to mix and apply it.
- Aerial spraying or spraying from trucks are the most dangerous ways to apply insecticides because it covers everything unnecessarily, harming people more than mosquitoes.
- Where they are available, use insecticides that kill larvae before they develop into mosquitoes. These kinds of insecticides, called larvicides, are almost always safer than the insecticides that kill adult mosquitoes. But do not use larvicides in drinking water.
- When handling chemicals, always use gloves, goggles or glasses, and clothing that covers you completely. Cover your mouth and nose with a protective mask. When you are done, wash yourself and your clothing. Wash your hands very carefully, especially before eating, drinking, or touching your face.

Make sure children are protected from insecticides. Compared to adults, their smaller, developing bodies are more likely to be harmed by insecticides.

Some insecticides, such as DDT, are just too dangerous to people and the environment and should not be used at all.

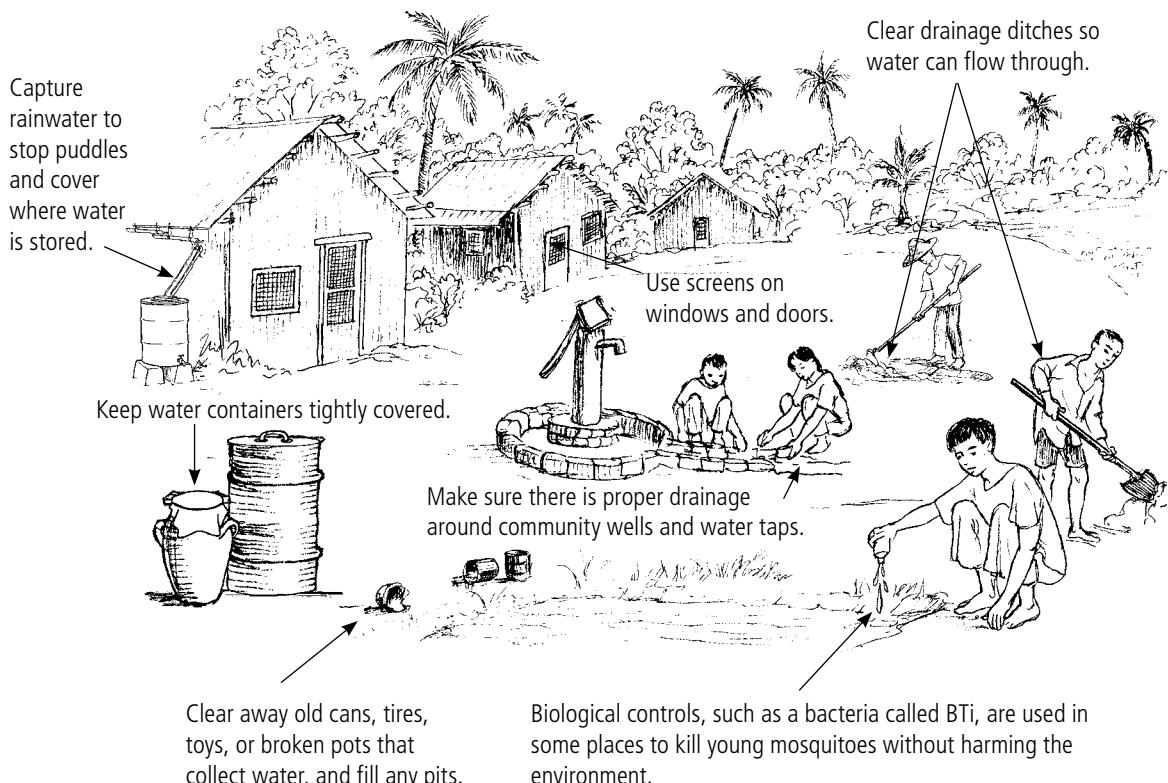


Prevent Mosquitoes From Breeding

Different kinds of mosquitoes breed in different kinds of water. Killing adult mosquitoes stops both their bite and their breeding, but killing the eggs or larvae that hatch in water, or taking away the water needed for mosquitoes to hatch the eggs, is most effective.

The mosquitoes that spread dengue, yellow fever, Zika, and chikungunya breed in clean standing water. If the mosquitoes find water, they lay eggs. After 2 days, the eggs hatch into larvae that live under the water surface. After 4 more days, the larvae begin to turn into mosquitoes with wings. In 2 more days, they can fly away. By getting rid of standing water once a week, mosquito breeding is interrupted because the eggs do not hatch.

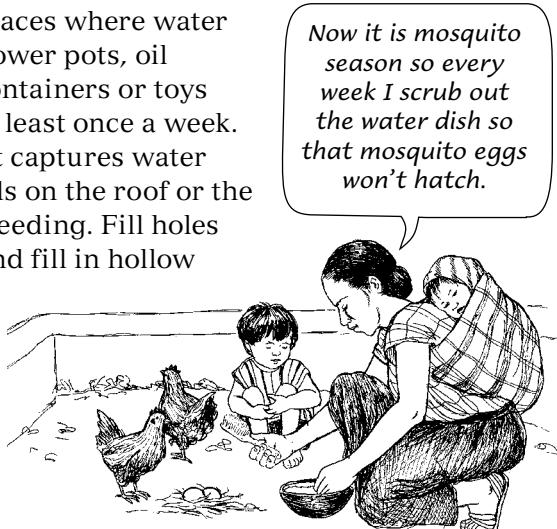
The mosquitoes that spread malaria also lay eggs in water—sometimes in small amounts of fresh water in or near the home like the dengue mosquito but also in larger bodies of water that cannot be emptied out or filled in. If there are any kinds of mosquitoes in or near your house, it is always a good idea to take away, empty out, or tightly cover places where water collects or is stored.



Remove mosquito breeding sites around the house and community

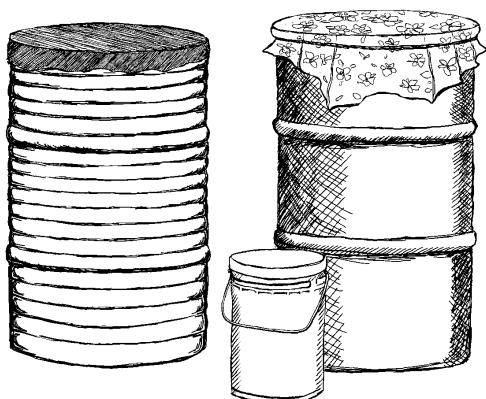
Outside the home: get rid of places where water collects such as old car tires, flower pots, oil drums, ditches, small plastic containers or toys and even bottle caps. Do this at least once a week. A sloped roof and a system that captures water that otherwise would form pools on the roof or the ground helps stop mosquito breeding. Fill holes in trees where water collects and fill in hollow fencing, especially bamboo.

Communities use many different materials to make mosquito traps that attract and kill mosquitoes and their eggs. One type of trap uses pieces of old tires that need to be cleared anyway for mosquito prevention.



Inside the home: Change the water in water dishes for animals and flower vases at least once a week. Unless containers are scrubbed clean, mosquito eggs can stick to the sides of the containers where they can live for months until there is water to make them hatch.

Outside and inside the home: Always tightly cover water storage containers so mosquitoes cannot get inside to lay eggs. If any eggs were laid, the cover will prevent hatched mosquitoes from flying away. If there are holes or gaps, the cover won't work. For containers, barrels, or water tanks with no lids, use screens or wire mesh with holes too small for a mosquito to enter, or cover with fabric that water will pass through and tie in place. Or use plastic lids that seal tightly. Make sure that rain cannot collect on top of the cover or mosquitoes will lay their eggs there!



Manage waterways and drain runoff from wells and taps

Where there is malaria, roadways and anywhere else water collects need attention to stop mosquitoes from breeding. Keeping natural waterways and rain water moving and flowing will keep water from collecting.

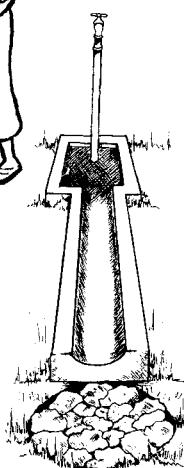
Manage land so water soaks into the ground or runs off into streams.

Clear streams blocked by eroded soil, leaves, or other debris. Hesperian's *Community Guide to Environmental Health* has more information on how to manage water and choose toilets and latrines that avoid pits of waste water.

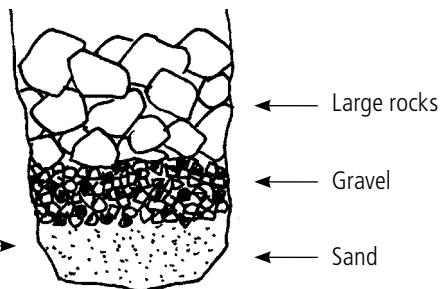


Wherever people collect water, water spills. When water collects in puddles, it becomes a breeding ground for mosquitoes that carry malaria and other illnesses. Wells, taps, outlets from storage tanks, and other water collection areas need good drainage to allow spilled water to flow away or to drain into the ground.

To take advantage of water that runs off, plant a tree or a vegetable garden where the water drains. If you cannot plant a tree or garden, make a hollow in the ground filled with rocks, gravel, and sand for the water to seep into. This is called a "soak pit." It will help prevent mosquitoes from breeding.



Community water tap with drainage



Soak pit

See if there are successful programs in your region using fish that eat mosquito larvae in ponds and lakes. Or find out if the bacteria called Bti is available because it can be used successfully to kill young mosquitoes before they breed and does not harm the environment.

Communities Prevent Mosquito Illnesses

Community health workers or any community group can help neighbors keep their yards and homes free of standing water to prevent mosquitoes from breeding and infecting everyone in the community. Are there elderly people, people with disabilities, or families without enough money that need your help? Youth-led or adult teams can help inspect houses, make or repair screens, and tightly cover water storage containers. Involve school children as part of their learning of nature and science.

Community clean-up efforts target vacant lots to keep them free of trash and containers that collect water. Containers can be turned over, tightly covered, or removed.

Other ways community leaders can help:

- Improve living conditions: build piped water systems, manage trash and waste water, design community building roofs to prevent pooling of water, and see if latrines or sanitation systems can be improved.
- Make malaria treatment more easily available.
- Distribute bednets and organize events to repair holes and renew treatment of bednets.
- Work together with health authorities for safe community management of any program using insecticides.



Used tires can become planters or even stairways!

Involve everyone in understanding how mosquitoes spread illness, how to avoid bites, and how to stop mosquitoes from breeding. Where are old tires piled up? Discuss who is most affected by mosquitoes in your community and how to prevent bites and mosquito breeding. Are women, men, children, and small babies affected differently? Think about who works or spends time where there are many mosquitoes, for example:

- Places where people fetch water or wash clothes, especially if the water source is still, or spilled water forms puddles or pools
- Farmland or mining sites where holes, pits, or trenches fill with rain
- Inside and around the house, where women and small children spend much of the day, and mosquitoes hide on walls and in the shadows
- Schoolrooms with no screens where children sit still for classes



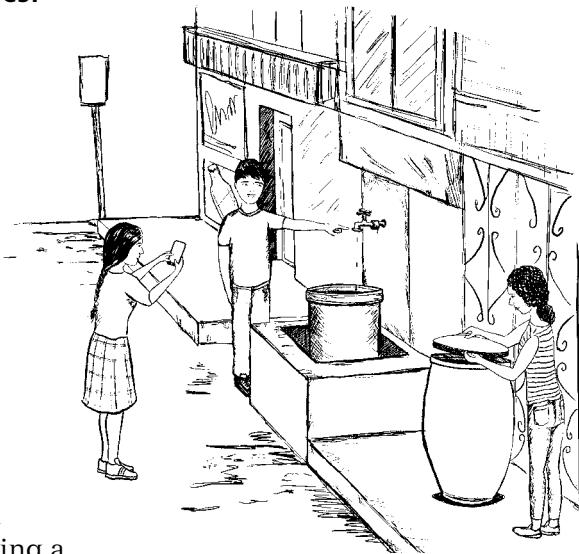
Cleaning out the mosquitoes!

To fight dengue and other diseases, neighborhood groups in different Latin American countries organized youth and health brigades to go house-to-house and remove places where mosquitoes breed.

Participants earn points when they take a photo of places where mosquito eggs or larvae can hide and they take another photo once they have fixed the problem, such as covering a water storage barrel so mosquitoes cannot get in or turning over a bucket so water cannot collect. By adding the photo to a webpage with a community map, everyone can see their progress and where else to visit. They call their webpage DengueChat and they use cell phones to post the images and motivate each other with messages.

Health brigade members take water samples and check for mosquito larvae. They can show the family how to:

- Keep water storage containers covered all the time to prevent egg-laying and new mosquitoes from flying away to bite people.
- Scrub containers once a week to prevent eggs from hatching.



These black spots are larvae that become mosquitoes. We must cover the water tank.



Brigade members became experts on how local mosquitoes breed and how to stop them.

Medicines

Medicine for Pain and Fever

Paracetamol, acetaminophen

Paracetamol is a good, affordable medicine for the fever and pain that comes from many mosquito illnesses.

Important

Do not take more than the recommended amount. Too much is poisonous to the liver and can kill. Keep this medicine out of the reach of children, especially if you have it as a sweetened syrup.

Cold medicines often contain paracetamol, so do not give them if you are also giving paracetamol or you may give too much.

How to use

- Give 10 to 15 mg per kg, every 4 to 6 hours. Do not give more than 5 times in 24 hours. If you cannot weigh the person, dose by age:

Under 1 year: give 62 mg ($\frac{1}{8}$ of a 500 mg tablet), every 4 to 6 hours.

1 to 2 years: give 125 mg ($\frac{1}{4}$ of a 500 mg tablet), every 4 to 6 hours.

3 to 7 years: give 250 mg ($\frac{1}{2}$ of a 500 mg tablet), every 4 to 6 hours.

8 to 12 years: give 375 mg ($\frac{3}{4}$ of a 500 mg tablet), every 4 to 6 hours.

Over 12 years: give 500 mg to 1000 mg, every 4 to 6 hours, but do not give more than 4000 mg in a day.

Medicines for Malaria

About malaria medicines

There are many medicines to treat and prevent malaria. But malaria parasites can develop resistance to medicines, meaning some no longer kill the parasites. Health workers, local health centers, or the government health authority know what medicines will work best in your area.

Medicines used to prevent malaria

Mefloquine (page 34), chloroquine (page 38), chloroquine and proguanil (page 40), atovaquone + proguanil (page 41), and doxycycline (page 44), are medicines used for prevention when people travel to regions with malaria from an area without malaria.

Primaquine (page 40) is used to prevent repeat attacks of some types of malaria after the malaria has been treated.

Monthly doses of amodiaquine with sulfadoxine + pyrimethamine are used in some Sahel region countries in Africa during the rainy season to prevent malaria in children under 5.

In other countries (also in Africa), malaria is prevented in infants by giving 3 doses of sulfadoxine + pyrimethamine in the first year of life. Usually they are given at the same time as common vaccinations.

In some countries, monthly doses of sulfadoxine + pyrimethamine are used to prevent malaria in pregnancy (page 36).

Medicines to treat severe malaria

Severe malaria (page 7) needs emergency treatment with IV or injectable artesunate in a hospital or clinic. Once the person has been treated and stopped vomiting, they will also need 3 days of artemisinin-based combination (ACT) medicines by mouth (see the list of 5 common ACT medicines below).

If emergency artesunate by injection is not available, a child with severe malaria who is vomiting can be given artesunate capsule suppositories (in the rectum) on the way to a health center (page 38). This can save the child's life.

Medicines to treat uncomplicated malaria from *P. falciparum*

The parasite *P. falciparum* causes malaria that is more likely to become severe (page 7). Depending on the region, chloroquine or other malaria medicines no longer work to treat falciparum malaria. Instead, use ACT (Artemisinin-based Combination Therapy) medicines. Use only the medicines that work in your area. Take ACT medicines for 3 days. See Using ACT medicines (page 31). Common ACT combinations are:

- **Artemether + lumefantrine (page 32)**
- **Artesunate + amodiaquine (page 32)**
- **Artesunate + mefloquine (page 33)**
- **Artesunate with sulfadoxine + pyrimethamine (page 35)**
- **Dihydroartemisinin + piperaquine (page 36)**

Medicines to treat uncomplicated malaria that is not from *P. falciparum*

Several malaria parasites cause uncomplicated malaria. Use ACT (Artemisinin-based Combination Therapy) if you don't know which type of malaria it is, or if the person could have 2 types of malaria at once. If the malaria where you live is resistant to chloroquine, you will need to find out which ACT will work instead.

If chloroquine still works to treat non-falciparum uncomplicated malaria where you live, it may be more available than ACT. Primaquine (page 40) is often used together with chloroquine (page 38) to cure the malaria more completely.

Medicines to treat malaria in pregnant women

For severe malaria, pregnant women need emergency treatment in a hospital or clinic with the same medicines used for any other adult.

To treat uncomplicated malaria in the first 3 months of pregnancy, use quinine and clindamycin (page 42). If a malaria test shows the uncomplicated malaria is caused by the vivax parasite, or if you do not have clindamycin, use only quinine.

To treat uncomplicated malaria for a woman whose pregnancy is more than 3 months, use the ACT or other medicines that work well in your area. Quinine, chloroquine, clindamycin, and proguanil are also safe during pregnancy. Do not use primaquine during pregnancy.

In some regions, pregnant women take sulfadoxine + pyrimethamine starting at week 13 of the pregnancy (page 36). Taking one dose per month for the rest of the pregnancy is called intermittent preventive treatment. This will stop malaria before it causes harm to the pregnancy or to the mother.

For all malaria medicines

Malaria may cause vomiting. Repeat the dose of medicine if you vomit within 60 minutes of taking it.

Take the malaria medicines for the full number of days, even if you already feel better. This is needed to kill all the malaria parasites. If the treatment is causing vomiting or if it is hard to give a child the medicine, talk to a health worker.

Even after starting treatment with medicines, watch for danger signs of severe malaria (page 7), especially in children and in women who are pregnant or have just given birth.

Artemisinin-based Combination Therapy (ACT)

Using ACT medicines

Some ACT come as single tablets combining 2 medicines (called fixed-dose combination tablets or coformulated tablets). Or they may come in a blister pack with 2 different tablets for each dose.

- Do not remove the tablets from the blister packaging until ready to use. Once a tablet is taken from the blister, use right away.
- If the 3-day treatment of ACT does not stop the malaria attack, try a different combination ACT. However, if the fevers and other signs return after 4 weeks, it is probably a new case of malaria.
- In regions where malaria transmission is low, health authorities may recommend a single dose of primaquine (page 40) together with the 3-day treatment of ACT.

Artemether + lumefantrine

Artemether and lumefantrine usually come as a fixed-dose combination tablet.

It is used to treat uncomplicated falciparum malaria, for other malaria types, and following emergency treatment of severe malaria.

This ACT combination medicine is not used to prevent malaria.

Side effects

Can cause nausea, stomach upset, dizziness, headache.

Important

To treat women for uncomplicated malaria in the first 3 months of pregnancy, give quinine and clindamycin where available instead of ACT combinations.

If you have heart problems, talk to an experienced health worker before taking this medicine.

How to use

Take with a full meal or with milk. Fat in the food helps the body use the medicine.

Tablets contain:

20 mg of artemether + 120 mg of lumefantrine

40 mg of artemether + 240 mg of lumefantrine

To treat uncomplicated malaria

Dose by body weight.

→ Using tablets of 20 mg of artemether and 120 mg of lumefantrine, give:

5 kg to 14 kg: 1 tablet, 2 times a day, for 3 days

15 kg to 24 kg: 2 tablets, 2 times a day, for 3 days

25 kg to 34 kg: 3 tablets, 2 times a day, for 3 days

35 kg and over: 4 tablets, 2 times a day, for 3 days

Artesunate + amodiaquine

Artesunate and amodiaquine come as a fixed-dose combination tablet or are given as separate tablets at the same time.

It is used to treat uncomplicated falciparum malaria, other malaria types, and following emergency treatment of severe malaria.

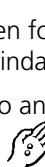
This ACT combination medicine is not used to prevent malaria.

Side effects



Can cause itchy skin, upset stomach, headache, dizziness.

Important



To treat women for uncomplicated malaria in the first 3 months of pregnancy, give quinine and clindamycin where available instead of ACT combinations.

Avoid giving to anyone taking zidovudine, efavirenz, or cotrimoxazole.

How to use



Tablets contain:

25 mg of artesunate + 67.5 mg amodiaquine

50 mg of artesunate + 135 mg amodiaquine

100 mg of artesunate + 270 mg amodiaquine

To treat uncomplicated malaria

Dose by body weight.

- Using tablets of 25 mg of artesunate and 67.5 mg amodiaquine, give:

4.5 kg to 8 kg: 1 tablet each day, for 3 days

9 kg to 17 kg: 2 tablets each day, for 3 days

- Using tablets of 100 mg of artesunate + 270 mg amodiaquine, give:

18 kg to 35 kg: 1 tablet each day, for 3 days

36 kg and over: 2 tablets each day, for 3 days

Artesunate + mefloquine

Artesunate and mefloquine come as a fixed-dose combination tablet or are given as separate tablets at the same time.

It is used to treat uncomplicated falciparum malaria and other malaria types.

Mefloquine by itself can be used for malaria prevention for people who travel to malaria regions from an area without malaria.

Side effects



Can cause dizziness, stomach upset, headache, and sleeping and vision problems when used to treat malaria.

Pregnant women may have more nausea with artesunate + mefloquine, so if available, use a different ACT.

Important

To treat women for uncomplicated malaria in the first 3 months of pregnancy, give quinine and clindamycin where available instead of ACT combinations.

Do not use mefloquine for infants under 3 months or weighing less than 5 kg.

Mefloquine should not be taken by persons with epilepsy or mental illness or severe kidney problems.

If you have heart problems, talk to an experienced health worker before taking this medicine.

Mefloquine sometimes causes strange behavior, confusion, anxiety, seizures or unconsciousness. If any of these signs develop, stop taking mefloquine immediately. If mefloquine had this effect on a person once, choose a different treatment if they get malaria again.

How to use

Take with food.

Tablets contain:

25 mg of artesunate + 55 mg of mefloquine (for children)

100 mg of artesunate + 220 mg of mefloquine (for adults)

To treat uncomplicated malaria

Dose by body weight.

- Using tablets with 25 mg of artesunate + 55 mg of mefloquine, give:
 - 5 kg to 8 kg:** 1 tablet each day, for 3 days
 - 9 kg to 17 kg:** 2 tablets each day, for 3 days
- Using tablets with 100 mg of artesunate + 220 mg of mefloquine, give:
 - 18 kg to 29 kg:** 1 tablet each day, for 3 days
 - 30 kg and over:** 2 tablets each day, for 3 days

Mefloquine to prevent malaria:

Comes in 250 mg mefloquine tablet

Take the dose once a week beginning 2 to 3 weeks before travel. Continue one dose each week while you are there and for 4 weeks after leaving the malaria region.

Mefloquine is not recommended for infants under 5 kg.

- Using 250 mg tablets, give:
 - 5 to 19 kg:** $\frac{1}{4}$ tablet (63 mg) one time each week
 - 20 to 29 kg:** $\frac{1}{2}$ tablet (125 mg) one time each week
 - 30 to 44 kg:** $\frac{3}{4}$ tablet (188 mg) one time each week
 - 45 kg and over:** 1 tablet (250 mg) one time each week

Artesunate with sulfadoxine + pyrimethamine

Sulfadoxine and pyrimethamine come as a fixed-dose combination tablet and is used together with artesunate to treat uncomplicated falciparum malaria and other malaria types.

Sulfadoxine + pyrimethamine is no longer recommended for treatment in some areas where it no longer works well. Check with your government health authority before using.

In countries where sulfadoxine + pyrimethamine tablets are used to prevent malaria in pregnant women, monthly doses start at week 13 of the pregnancy (page 36).

Side effects

Can cause stomach upset and skin rash.

Important

To treat women for uncomplicated malaria in the first 3 months of pregnancy, give quinine and clindamycin where available instead of ACT combinations.

For infants, use a different ACT.

Do not use sulfadoxine + pyrimethamine if you are already taking cotrimoxazole.

Sulfadoxine + pyrimethamine should not be taken by anyone who has ever had a reaction to a sulfa medicine. If the medicine causes a rash or itching, drink lots of water and do not take it again.

How to use

The sulfadoxine + pyrimethamine combination tablet comes in different strengths of each of the 2 medicines it contains.

To treat uncomplicated malaria

This ACT is a 3-day treatment as follows: on days 1, 2, and 3, give the dose of artesunate. Also on day 1, give 1 dose of sulfadoxine + pyrimethamine.

Dose by body weight.

- Using tablets with 50 mg of artesunate tablet, give:
 - 5 kg to 9 kg:** ½ tablet, 1 time each day, for 3 days
 - 10 kg to 24 kg:** 1 tablet, 1 time each day, for 3 days
 - 25 kg to 50 kg:** 2 tablets, 1 time each day, for 3 days
 - 50 kg or over:** 4 tablets, 1 time each day, for 3 days
- Using tablets with 500 mg of sulfadoxine + 25 mg of pyrimethamine also give:
 - 5 kg to 9 kg:** ½ tablet the first day only
 - 10 kg to 24 kg:** 1 tablet the first day only
 - 25 kg to 50 kg:** 2 tablets the first day only
 - 50 kg or over:** 3 tablets the first day only

Women who are pregnant and are being treated with this ACT combination can continue a daily dose of 0.4 mg (400 mcg) of folic acid but not higher. Too much folic acid interferes with the malaria medicine.

Sulfadoxine + pyrimethamine is used to prevent malaria in pregnancy

In some African countries, all pregnant women are given monthly doses of sulfadoxine + pyrimethamine because malaria is so common and so dangerous for the mother and for developing child. The monthly doses begin when the woman at week 13 of the pregnancy. Bednets (page 20) also help prevent malaria during pregnancy and after the baby is born.

- ➔ Using tablets with 500 mg of sulfadoxine + 25 mg of pyrimethamine:
 During week 13 to 16 of the pregnancy, give the first dose of 3 tablets. One month later, give a second dose of 3 tablets. After another month, give a third dose of 3 tablets. Repeat each month until the 6th dose is reached or the child is born. Always wait at least one month between each dose.

Some pregnant women may have nausea, vomiting, and dizziness when they take sulfadoxine + pyrimethamine, especially with the first dose.

Pregnant women also need iron and folic acid to keep the baby well and prevent anemia. If taking sulfadoxine + pyrimethamine each month for malaria prevention, take a daily dose of 0.4 mg (400 mcg) of folic acid but not higher. Too much folic acid interferes with the malaria medicine.

Dihydroartemisinin + piperaquine

Dihydroartemisinin and piperaquine come as a fixed-dose combination tablet.

It is used to treat uncomplicated falciparum malaria, other malaria types, and following emergency treatment of severe malaria.

This ACT combination medicine is not used to prevent malaria.

Side effects

May cause a fast heartbeat, upset stomach, itching.

Important ▲

To treat women for uncomplicated malaria in the first 3 months of pregnancy, give quinine and clindamycin where available instead of ACT combinations.

Do not use when taking erythromycin.

Use with caution with people over 60 years old, people with HIV taking antiretroviral medicines, or people with heart, kidney or liver problems.

How to use

Take between meals with a full cup of water. Do not take with milk or food that has fat because this changes how well the medicine works.

Tablets contain:

20 mg of dihydroartemisinin + 160 mg of piperaquine (for children)

40 mg of dihydroartemisinin + 320 mg of piperaquine (for adults)

Children that weigh less than 25 kg receive a dose based on 2.5 mg/kg for dihydroartemisinin and 20 mg/kg for piperaquine. This is a higher dose per kg than used with older children and adults.

To treat uncomplicated malaria

Dose by body weight.

- Using tablets with 20 mg of dihydroartemisinin + 160 mg of piperaquine, give:
 - 5 kg to 7 kg:** 1 tablet each day, for 3 days
 - 8 kg to 10 kg:** 1 ½ tablets each day, for 3 days
- Using tablets with 40 mg of dihydroartemisinin + 320 mg of piperaquine, give:
 - 11 kg to 16 kg:** 1 tablet each day, for 3 days
 - 17 kg to 24 kg:** 1 ½ tablets each day, for 3 days
 - 25 kg to 35 kg:** 2 tablets each day, for 3 days
 - 36 kg to 59 kg:** 3 tablets each day, for 3 days
 - 60 kg to 79 kg:** 4 tablets each day, for 3 days
 - 80 kg and over:** 5 tablets each day, for 3 days

Artesunate

Artesunate is a medicine of the artemisinin family. To treat uncomplicated falciparum malaria, artesunate in tablet form is used in combination with one of these: amodiaquine (page 32), mefloquine (page 33), or sulfadoxine + pyrimethamine (page 35). Combining these medicines is called Artemisinin Combination Therapy (ACT), see page 31.

For emergency treatment with severe malaria, health workers use intravenous (IV) artesunate or artesunate injections in the muscle (IM) to treat severe malaria. After at least 24 hours of this treatment, and when the person is no longer vomiting, she will also need 3 days of ACT treatment taken by mouth.

Artesunate injections are also for trained health workers to treat adults and children before transfer to a hospital that is far away. Artesunate also comes as suppositories that go in the rectum for children under 6 years old on the way to medical help (page 38).

Artesunate is not used to prevent malaria.

Side effects



Artesunate can cause dizziness, headaches and stomach upset.

How to use



For uncomplicated falciparum malaria use with another medicine as part of ACT:

Artesunate comes in 50 mg tablets. See page 35 for the dose of artesunate and sulfadoxine + pyrimethamine when used as a part of ACT. For other ACT combinations, the artesunate is combined with the other medicine into a single tablet or comes in a blister package with the 2 tablets that are taken together.

How to use artesunate suppositories for children with severe malaria:

When a child 6 years or younger has signs of severe malaria, is vomiting, and is far from a health center that can treat her with intravenous (IV) artesunate or artesunate injections in the muscle (IM), use artesunate gelatin capsules (called suppositories) in the rectum on the way to get help. This can save her life. After putting the capsule in the rectum, hold the child's buttocks together for about 10 minutes to make sure the capsule does not fall out. If it does come out within the first 30 minutes, repeat the dose.

If the child weighs 5 to 10 kg, use one suppository of 100 mg, and if 10 kg or more, use 2 of the 100 mg capsules. If 50 mg suppository capsules are available, use only 1 for a baby that weighs under 5 kg.

Emergency treatment does not cure malaria. The child will need more treatment by an experienced health worker.

More medicines used for malaria

Chloroquine

In most of the world, malaria is now resistant to chloroquine. Find out which medications work best in your area. If you do not know which type of malaria a person has, it is best to treat with Artemisinin Combination Therapy (ACT).

When treating malaria with chloroquine, you will also need primaquine (page 40) to prevent the malaria from coming back.

In a few countries where malaria is not resistant to it, chloroquine by itself is used to prevent malaria. In countries where the resistance is low, chloroquine combined with proguanil (page 41) is sometimes used to prevent malaria.

Chloroquine is safe for women who are pregnant or breastfeeding for both prevention and treatment of malaria.

Side effects



May cause mild dizziness, nausea, vomiting, abdominal pain, itching.

Important ▲

If the dose is too high, chloroquine is very dangerous, especially to children.

Do not use if the person has epilepsy.

Use with caution if the person has diabetes.

How to use

Take with food.

Chloroquine comes in two forms, chloroquine phosphate and chloroquine sulfate. The active part of the chloroquine is called the base.

Dose by body weight. The total of chloroquine base given over 3 days is 25 mg/kg as follows:

- ➔ Day 1: 10 mg chloroquine base per kg
- Day 2: 10 mg chloroquine base per kg
- Day 3: 5 mg chloroquine base per kg

Chloroquine phosphate tablets usually come in 250 mg tablets (with 150 mg chloroquine base).

Chloroquine sulfate tablets usually come in 200 mg tablets (with 155 mg chloroquine base).

Be sure you know which type of chloroquine you have and how much chloroquine base is in it (tablet strength).

To treat uncomplicated malaria that is not resistant to chloroquine

Using chloroquine phosphate 250 mg tablets (150 mg chloroquine base) OR using chloroquine sulfate 200 mg tablets (155 mg chloroquine base):

- ➔ Give one dose on day 1 and again on day 2:
Less than 8 kg: $\frac{1}{2}$ tablet
kg: 1 tablet
16 kg to 30 kg: 2 tablets
31 kg to 45 kg: 3 tablets
46 kg and over: 4 tablets
- ➔ On day 3, give half of the day 1 dose:
Less than 8 kg: $\frac{1}{4}$ tablet
8 kg to 15 kg: $\frac{1}{2}$ tablet
20 kg to 30 kg: 1 tablet
31 kg to 45 kg: $1\frac{1}{2}$ tablets
46 kg and over: 2 tablets

To prevent vivax malaria where it is not resistant to chloroquine

For prevention, take chloroquine once a week beginning 1 or 2 weeks before travel. Continue one dose each week while you are there and for 4 weeks after leaving the malaria region. Give the dose used for day 3 of treatment shown above. For example, for prevention an adult takes weekly either 2 tablets of chloroquine phosphate with 150 mg chloroquine base or 2 tablets of chloroquine sulfate with 155 mg chloroquine base.

To prevent falciparum malaria where resistance to chloroquine is low

For travelers to countries where there is some resistance to chloroquine but the medicine still works, chloroquine is taken once a week while also taking proguanil once a day to prevent malaria. Start both medicines 1 week before travel. Continue one dose each week while you are there and for 4 weeks after leaving the malaria region. Take the chloroquine the same day each week and the proguanil the same time each day. Take with food.

- Using chloroquine tablets with either 155 mg or 150 mg chloroquine base and proguanil tablets with 100 mg of proguanil hydrochloride:
 - 1 to 4 years old:** $\frac{1}{2}$ tablet proguanil each day and $\frac{1}{2}$ tablet chloroquine each week
 - 5 to 8 years old:** 1 tablet proguanil each day and 1 tablet chloroquine each week
 - 9 to 14 years old:** 1 and $\frac{1}{2}$ tablet proguanil each day and 1 and $\frac{1}{2}$ tablet chloroquine each week
 - 15 years and older:** 2 tablets proguanil each day and 2 tablets chloroquine each week

Primaquine

Primaquine is used for 14 days along with or right after treatment with chloroquine to prevent returning fever attacks from malaria types that are not falciparum.

In some regions, a single dose of primaquine is given on the first day of the 3-day ACT treatment for falciparum malaria. This helps keep falciparum from spreading to others.

Important ▲

Primaquine is not given to women who are pregnant or breastfeeding a baby 6 months or younger.

Primaquine is usually not given to children younger than 1 year old.

For people with a blood condition called G6PD deficiency (favism), an experienced health worker uses a lower dose of primaquine, spread out over many weeks.

Side effects



Upset stomach and stomach pain.

How to use



Take with food.

Primaquine phosphate is a common form of primaquine. Often tablets contain 15 mg of primaquine base, the active part of the medicine.

To keep non-falciparum malaria from returning in the same person, use with or right after treatment with chloroquine

Dose by weight or if you cannot weigh the child, dose by age.

- Using tablets with 15 mg primaquine base, give:
 - 10 kg to 24 kg (3 to 7 years):** $\frac{1}{4}$ tablet each day for 14 days
 - 25 kg to 49 kg (8 to 11 years):** $\frac{1}{2}$ tablet each day for 14 days
 - 50 kg and over (12 years and older):** 1 tablet each day for 14 days

To keep falciparum malaria from spreading, where falciparum is not common

In some regions, adding a single dose of primaquine to ACT treatment is recommended to keep malaria from spreading.

- On the first day of the 3-day ACT treatment, and using tablets with 15 mg primaquine base, give:

10 kg to 24 kg (3 to 7 years): $\frac{1}{4}$ tablet one time

25 kg to 49 kg (8 to 11 years): $\frac{1}{2}$ tablet one time

50 kg and over (12 years and older): 1 tablet one time

Proguanil and Atovaquone + proguanil

Proguanil is usually for malaria prevention by travelers. Proguanil is always used with another malaria medicine.

Side effects

Can cause headache, cough, diarrhea, and mild upset stomach.

Important

People with serious kidney problems should not use proguanil.

How to use

Take with food.

Proguanil and chloroquine together (page 40) are used to prevent malaria in areas where there is low resistance to chloroquine.

Atovaquone and proguanil come as a fixed-dose combination tablet. It is mostly used to prevent malaria but in countries where ACT and other malaria medicines no longer work, it is sometimes used to treat malaria in combination with artesunate and primaquine.

Tablets contain:

62.5 mg atovaquone + 25 mg proguanil (for children)

250 mg atovaquone + 100 mg proguanil (for adults)

To prevent malaria

Both adults and children take one dose each day beginning 1 or 2 days before travel. Continue one dose each day while you are there and for 7 days after leaving the malaria region.

- Using tablets made for children with 62.5 mg atovaquone + 25 mg proguanil, give:

5 kg to 7 kg: $\frac{1}{2}$ tablet each day

8 kg to 9 kg: $\frac{3}{4}$ tablet each day

10 to 19 kg: 1 tablet each day

20 kg to 29 kg: 2 tablets each day

30 kg to 39 kg: 3 tablets each day

40 kg and over: 4 children's tablets OR 1 adult tablet each day.

Quinine, injections

Severe malaria is a medical emergency. A quinine injection into the muscle is sometimes used to treat a person before sending her to the hospital. Quinine injections should only be given by an experienced health worker who knows the correct dose and how to give it. For children with severe malaria, if injectable artesunate is not available, it is safer to use artesunate suppositories instead of quinine on the way to get treatment (see page 39).

Quinine sulfate, tablets

Quinine tablets by mouth are used to treat uncomplicated malaria where chloroquine does not work.

For women in the first 3 months of pregnancy, use both quinine and clindamycin to treat falciparum malaria. For vivax malaria that is resistant to chloroquine, use quinine alone.

The combination of quinine and either clindamycin or doxycycline is sometimes used if an ACT is not available to finish treating the person following emergency care for severe malaria.

Quinine is not used to prevent malaria.



Side effects

Quinine sometimes causes sweaty skin, ringing of the ears or problems with hearing, blurred vision, dizziness, nausea and vomiting, and diarrhea.

If the person is vomiting up the quinine, an anti-nausea medicine such as promethazine may help.

Important ▲

Taking too much quinine is dangerous. Quinine can cause blood sugar levels to drop too low. Get medical help for danger signs such as dizziness, confusion, loss of consciousness, or the heart beating too fast or too slow.

Do not use quinine if taking chloroquine or mefloquine.



How to use

Treat with quinine for 3 or 7 days, depending on the region. Clindamycin or doxycycline may also be needed.

Quinine sulfate, quinine hydrochloride, and quinine dihydrochloride come in tablets of 300 mg and their dose is the same. By body weight, the dose is 10 mg of quinine sulfate per kg taken 3 times a day. Quinine bisulfate tablets, however, have a different dose: 14 mg per kg taken 3 times a day.

To treat uncomplicated chloroquine-resistant falciparum malaria

Depending on where you live, treatment will be for 3 or 7 days.

Dose by body weight.

- Using quinine sulfate, quinine hydrochloride, and quinine dihydrochloride tablets of 300 mg, give:
 - 7 to 11 kg:** ¼ tablet, 3 times a day
 - 12 to 24 kg:** ½ tablet, 3 times a day
 - 25 to 34 kg:** 1 tablet, 3 times a day
 - 35 to 49 kg:** 1½ tablets, 3 times a day
 - 50 kg and over:** 2 tablets, 3 times a day

Also take **clindamycin or doxycycline** for 7 days starting on day 2 or day 3 after starting the quinine, when the person is less likely to vomit the medicines. For dosing of doxycycline, see page 44. For clindamycin, the dose each day is 20 mg per kg of body weight for 7 days, divided into 2 doses per day.

- Using clindamycin capsules of 150 mg, give:
 - 10 to 19 kg:** 1 capsule (150 mg), 2 times a day, for 7 days
 - 20 to 29 kg:** 2 capsules (300 mg), 2 times a day, for 7 days
 - 30 to 44 kg:** 3 capsules (450 mg), 2 times a day, for 7 days
- Using clindamycin capsules of 300 mg, give:
 - 45 kg and over:** 2 capsules (600 mg), 2 times a day, for 7 days

Important ▲

If you develop watery or bloody diarrhea, stop taking clindamycin immediately.

Because the drug can pass through breast milk to a baby, avoid giving clindamycin to breastfeeding women.

Do not take antacids for 2 hours before or after taking clindamycin. They make the medicine less effective.

To treat uncomplicated chloroquine-resistant vivax malaria

- Use quinine sulfate and either clindamycin or doxycycline as for chloroquine-resistant falciparum malaria (see above). After that treatment, add 14 days of primaquine (see page 40). But do not add primaquine for a pregnant woman.

Doxycycline

Doxycycline is an antibiotic with many uses. It can be used to treat malaria when combined with quinine. Doxycycline is also used to prevent malaria for travelers.

Side effects



Heartburn, stomach cramps, diarrhea, and yeast infections are common.

Important ▲

Pregnant women and children under 8 years old should avoid doxycycline or tetracycline because these medicines can damage or stain teeth and bones.

Use with caution for a person with kidney, liver, stomach diseases or with gastritis.

Avoid iron pills and antacids for 2 hours before or after taking doxycycline. They will make the medicine less effective.

Avoid spending time in the sun while taking doxycycline to prevent sunburn and skin rash.

Doxycycline may make birth control pills less effective. If possible use another birth control method (such as condoms) while taking this medicine.

How to use



Take doxycycline with a full cup of water. Take with food if it upsets your stomach.

To use with quinine to treat uncomplicated chloroquine-resistant malaria

→ For uncomplicated falciparum malaria, start doxycycline 1 or 2 days after starting the quinine or as soon as the person can take the medicine without vomiting:

Child over 8 years but under 40 kg: 50 mg, 2 times each day, for 7 days

Child over 40 kg and adults: 100 mg, 2 times each day, for 7 days

Also give quinine (page 43).

To use with quinine to treat uncomplicated vivax malaria

→ Give the doxycycline and quinine as above, and when finished, also take primaquine for 14 days (page 40).

To prevent malaria for travel to areas with malaria:

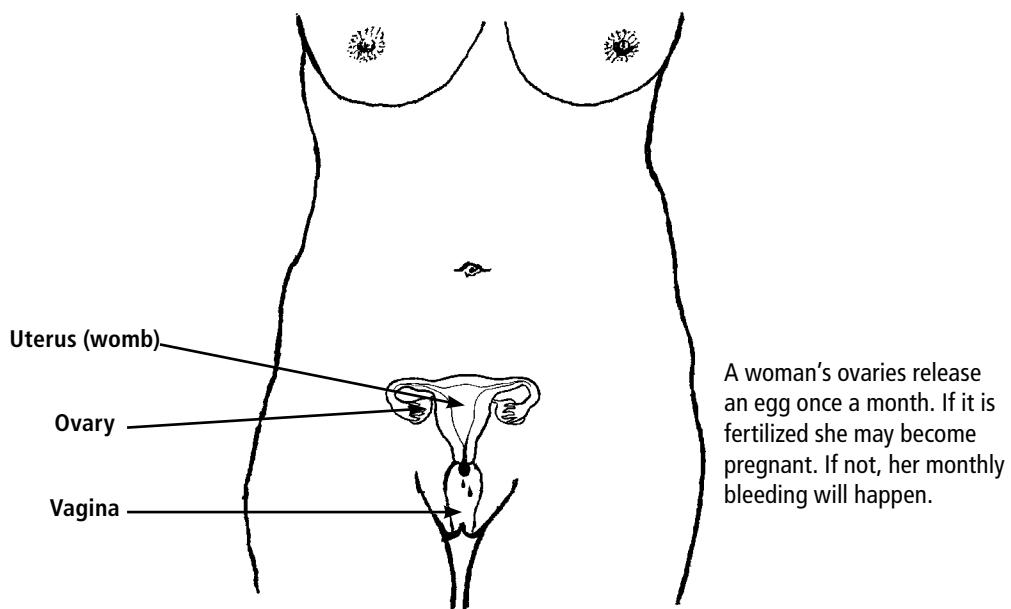
→ Both adults and children take one dose of doxycycline each day beginning a day or two before travel. Continue one dose each day while you are there and for 28 days after leaving the malaria region.

Child over 8 years but under 40 kg: 50 mg one time each day

Child over 40 kg and adults: 100 mg one time each day

Women's Menstrual Cycles

About once each month during her reproductive years, a woman has a few days when a bloody fluid leaves her womb and passes through her vagina and out of her body. This normal monthly bleeding is called menstruation, or a menstrual period. Because the same pattern happens each month, it is called the menstrual cycle. Most women bleed every 28 days. But some bleed as often as every 20 days or as seldom as every 45 days.



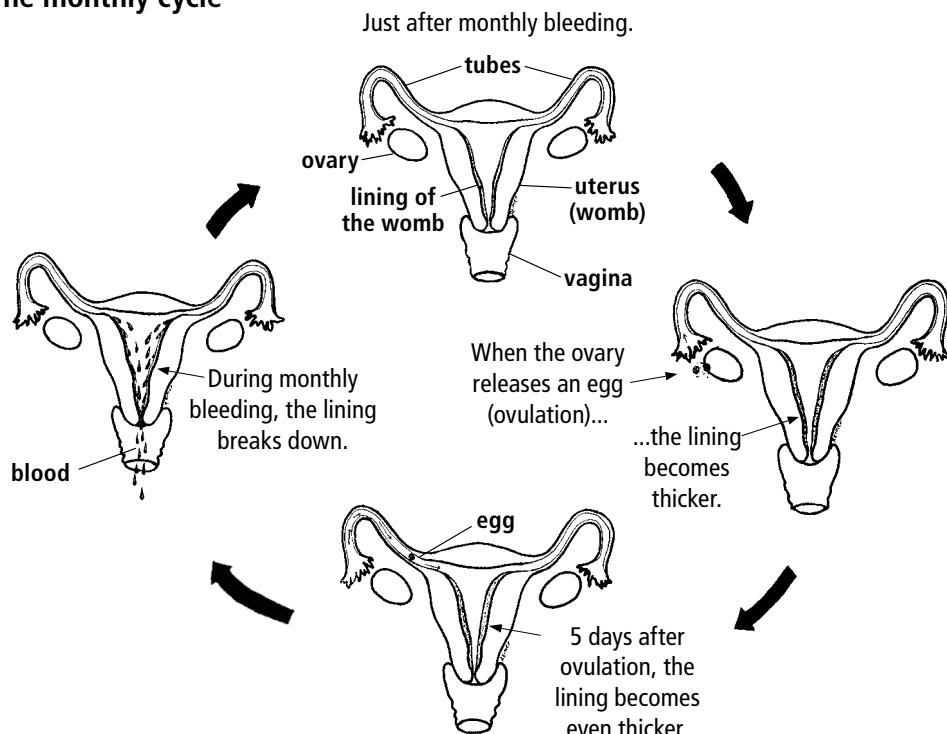
Menstruation is a normal part of women's lives. Knowing how the menstrual cycle affects the body and the ways menstruation changes over a woman's lifetime can let you know when you are pregnant, and help you detect and prevent health problems. Also, many family planning methods work best when women and men know more about the menstrual cycle (see Family Planning).

Hormones and the menstrual cycle

In women, the hormones estrogen and progesterone are produced mostly in the ovaries, and the amount of each one changes throughout the monthly cycle. During the first half of the cycle, the ovaries make mostly estrogen, which causes the lining of the womb to thicken with blood and tissue. The body makes the lining so a baby would have a soft nest to grow in if the woman became pregnant that month. When the soft lining is ready, an egg is released from one of the ovaries. This is called ovulation. The egg then travels down a tube into the womb. At this time a woman is fertile and she can become pregnant. If the woman has had sex recently, the man's sperm may join with her egg. This is called fertilization.

During the last 14 days of the cycle, a woman also produces progesterone. Progesterone causes the lining of the womb to prepare for pregnancy. Most months, the egg is not fertilized, so the lining inside the womb is not needed. Then, the ovaries stop producing estrogen and progesterone, and the lining begins to break down. The monthly bleeding is when the lining inside the womb leaves the body. This is the start of a new monthly cycle. After the monthly bleeding, the ovaries start to make more estrogen again, and another lining begins to grow.

The monthly cycle



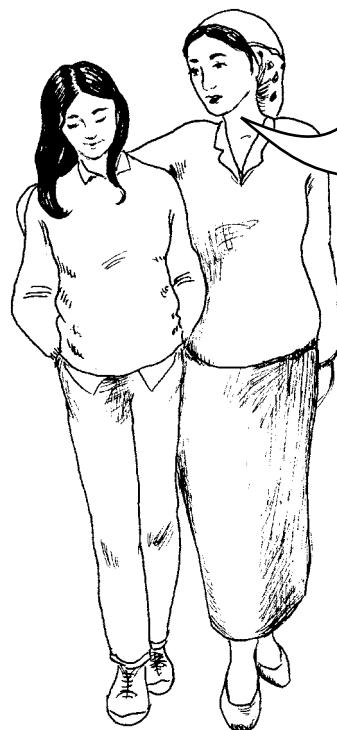
For most women, the whole menstrual cycle takes about 28 days —just like the cycle of the moon.

Menstruation

Girls start bleeding around age 12, some earlier, some later. For the first year or so, menstruation can be very short, and can also happen on and off instead of once a month. This is normal.

Girls who were never told about menstruation often think something is wrong when their bleeding starts. Girls are more confident and comfortable when they have been told about it and know what to expect.

Menstruation is a sign that a girl can become pregnant. But she can actually become pregnant a few months **before** her first menstruation, because her ovaries start releasing eggs first. (To learn about pregnancy and family planning methods, see Family Planning.) Even though a girl's body has the ability to get pregnant, it does not mean that pregnancy is safe for her or that she is ready to be a mother. Teach girls how pregnancy happens and about different family planning methods. Make sure family planning is available to girls.



This means you are a woman now. I will show you how to use a cloth to stay clean. Then we will cook your favorite dinner tonight.

Every girl needs an adult she trusts or a health worker to talk with about how her body is developing.

Keeping clean during menstruation

All girls and women are more comfortable during their periods when they can stay clean. This helps girls keep going to school and helps all women continue normal activities. Bathing and also changing pads frequently help prevent infection. During your period:

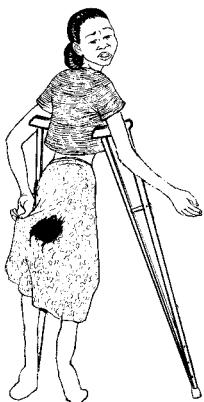
- Use clean, dry cloths, sanitary napkins (pads), or tampons, and change them several times a day.
- Bathe every day and wash the genitals.
- Wash cloths with hot water and soap, and dry them in the sun if possible before using them again.



Pad



Tampon



Some girls or women with disabilities may need extra help when they have their period.

Menstruation and daily activities

Different myths exist about menstruation and the things a girl or woman should or should not do during her period. Many of these myths are used to keep girls and women from taking active roles in their communities. Women do not have to act differently during their periods. The following is true for all women:

Food: All kinds of food are fine for a woman to eat during her period. If the food is healthy, it is also healthy and safe for her to eat during menstruation. If she has heavy bleeding, eating foods with iron (see page 8 of Good Food Makes Good Health) can help prevent anemia.

Exercise: Normal activities and exercise are fine for a woman during her period. Exercising may even help reduce pain or cramping.

Bathing: Bathing while menstruating is healthy. Keeping the genitals clean can help prevent infection.

Sex: A woman can have and enjoy sex during her period. However, if one of the partners has HIV, the risk of infecting the other may be higher.

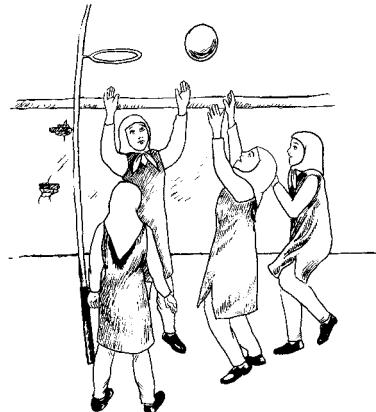
Concerns and Problems with Bleeding

Pain

Pain or cramps are common just before and during menstruation, and are not dangerous. Some women also feel tired or get mood changes, headaches or diarrhea. All of these are due to the changes in hormones at the end of the cycle (see page 2).

Treatment

- Take ibuprofen or another mild pain medicine.
- Rub or massage the lower belly or back.
- Use a hot water bottle or other container that is made to hold hot water, and place it on the lower belly or lower back. Or use a thick cloth soaked in hot water to warm the lower belly.
- Exercise or walk. Being active can help.



There are many local remedies and treatments for painful menstruation. If no remedy seems to be much help, you can try taking daily low-dose combination birth control pills for 6 to 12 months. Sometimes the hormones in birth control pills help lessen the pain. See page 9 and page 22 in Family Planning.

Pain in the lower belly when you are not bleeding is not normal. It can be caused by infection (see page 16 in Belly Pain, Diarrhea, and Worms), ectopic pregnancy (see page 10 of Belly Pain, Diarrhea, and Worms), cancer (see Cancer, in development), or some other problem. See a health worker.

Irregular bleeding

Regular bleeding is bleeding that starts about the same time each month and lasts about 5 days. But there is a lot of variation: some women start bleeding about once every 35 days, some every 24 days. Some women have several months with no bleeding. Some have a few months with a shorter cycle, and then a few months with a longer cycle. All of this is usually normal and just another way that each person's body is different.

Birth control injections or pills can help make menstruation more regular.

Too much bleeding

Some women have very heavy bleeding, or menstruation that lasts more than a week. This blood loss can lead to anemia which weakens the body and makes you tired. Women who have HIV and bleed too much are especially likely to get anemia. Eat plenty of iron-rich foods like meat, beans, eggs, and dark green vegetables. This helps replace the nutrients lost during menstruation. For more on anemia, see page 8 in Good Food Makes Good Health. An iron supplement is also helpful (see page 39 in Good Food Makes Good Health).

Heavy menstrual bleeding or bleeding between menstrual periods can be a sign of small growths in the uterus (womb), either fibroids or polyps (see page 7).



More than 2 pads full of blood in an hour is too much. Get help.

If heavy menstruation is bothering you, birth control injections or taking birth control pills daily may help. Talk with an experienced health worker.

The IUD, a birth control method, may cause heavier, more painful periods for some women. See page 16 in Family Planning.

Get help if there are signs of too much blood loss (feeling weak, dizziness, pale skin).

Bleeding is rare or stops

Infrequent periods or a stop in bleeding can be caused by:

- Pregnancy. Always consider that pregnancy could be the cause – even if you are older, if you only had sex one time, if you are breastfeeding, or if you thought you could not get pregnant. A pregnancy test is the sure way to know if you are pregnant.
- Breastfeeding can stop menstruation for a few months.
- Some birth control injections or pills can stop menstruation. This is not harmful.
- Being young or old. It is normal and not harmful for young women and older women to have infrequent menstruation.
- Extreme stress, either emotional or physical. Menstruation should come back when the stress is relieved.
- Malnutrition. When a woman is too thin, her body stops menstruating.



Bleeding between menstrual periods

Some women have light bleeding between menstrual periods. If this happens once or twice, it is not likely to be a problem. If it keeps happening, it can be a sign of an infection in the vagina, cervix, or womb. For more on these infections, see Genital Problems and Infections (in development).

Bleeding between menstrual periods or heavy menstrual bleeding can also be a sign of small growths in the uterus – either fibroids or polyps. A pelvic exam by a trained health worker or an ultrasound test may be needed to find these growths. Often fibroids and polyps need no treatment at all but if they do cause problems, they can be removed. You may need surgery to remove fibroids but polyps can usually be removed by a trained health worker in a clinic. For more on fibroids or polyps see *Where Women Have No Doctor*, also available from Hesperian Health Guides.

Bleeding between menstrual periods or bleeding experienced by older women who have stopped menstruating (menopause) can also be a sign of cancer. See a health worker. Cancer in the cervix can be treated and cured when it is found early (see Cancer, in development).



When something is different or painful about your period, don't be shy — talk to your health worker about it.

Bleeding after sex is not normal. It can be caused by a sexually transmitted infection (see Genital Problems and Infections, in development) or cancer (see Cancer, in development). It can also happen after rough or forced sex.

Bleeding during pregnancy is not normal. Early in pregnancy it can be a sign of losing the pregnancy (miscarriage). Later in pregnancy, it can be a very dangerous sign that the placenta is separating from the womb. This is an emergency and medical help is needed to prevent the woman from bleeding to death.

Menopause: The End of Menstruation

Women usually stop menstruating around age 50. Before menstruation stops completely, a woman's periods can become very irregular. A woman may go months between menstrual periods. Bleeding can become lighter or heavier.

For some women, other noticeable signs of menopause include changes in mood, sleep problems, and hot flashes that result from changing hormones inside the woman's body. These can be uncomfortable or upsetting, but for many women they lessen or go away within a few years.

The vagina gets dryer and smaller during menopause. Use a water-based lubricant like saliva or K-Y Jelly to make sex more comfortable and to avoid the small tears that can happen when the vagina is dry during sex. Do not use skin creams or oils in the vagina because these can cause irritation. See page 9 in Family Planning to learn more about lubricants.

Along with an end to bleeding, women stop releasing eggs during menopause, and so eventually can no longer become pregnant. But for as long as a year after bleeding stops, the body may still release eggs and a woman might still become pregnant months after menstruation stops.

Although in some countries women mourn the end of their body's ability to have children, many cultures see menopause as a transition when "wise women" become respected elders in the community.



Hormone Replacement Therapy

In the past, doctors recommended that women take medicines containing estrogen and progesterone to relieve the symptoms of menopause. This is called Hormone Replacement Therapy (HRT). Now it is known that **HRT is not safe** and increases women's risk of breast cancer, heart disease, blood clots, and stroke.

Family Planning

This chapter discusses ways to prevent pregnancy or plan how much time you want between pregnancies. All the methods explained in this chapter are used safely by people all around the world.

Why Family Planning?

There are many safe, effective ways to prevent pregnancy, or help you choose when to have a baby and how many children to have. You can usually get low-cost or free methods from health workers or clinics.

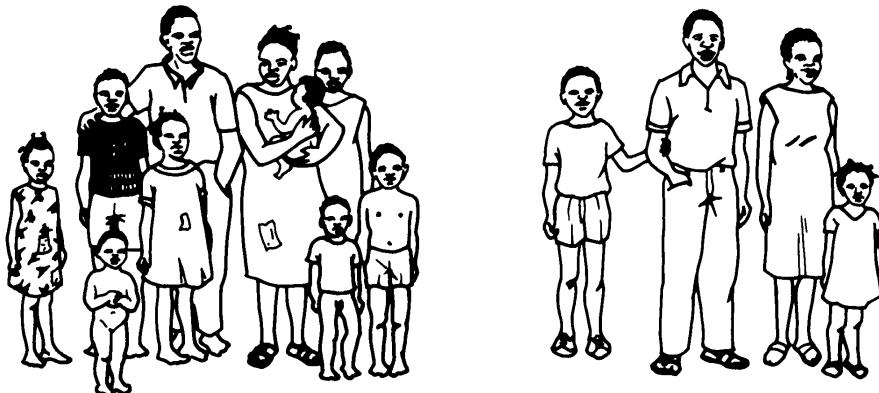


Family planning is also called birth control or contraception. No matter what you call it, it has many benefits:

- Having fewer children is healthier for a woman's body than having many. By using family planning, you can decide when your body is healthy enough to be pregnant.
- Waiting to have children and taking time between children can allow you to make a secure life for them, and gives you more time, energy, and money to care for the children you already have.
- Deciding if and when you want to have children, without others telling you that you should — or should not — gives you more control of your life.
- Enjoying sex without worrying about getting pregnant if you or your partner do not want or are not ready to have a child.
- Family planning helps women avoid unsafe abortion, which kills thousands of women every year.

Family planning, sex, pregnancy — sometimes these things are hard to talk about. Hesperian's book *Health Actions for Women* suggests ways to get men and women talking about family planning and other women's health issues.

Some people want a lot of children because children help with work and provide care for their parents in old age. This is especially true where people are denied a fair share of resources and it is common for children to die when they are still young.



The situation is different in countries where resources and benefits are more fairly distributed. Where employment, housing, and health care are more available, and where women have equal opportunities for education, jobs, and control over their lives, people usually choose to have smaller families. This is in part because they do not need to depend on their children for economic security, and they are more confident the children they do have will be healthy and survive.

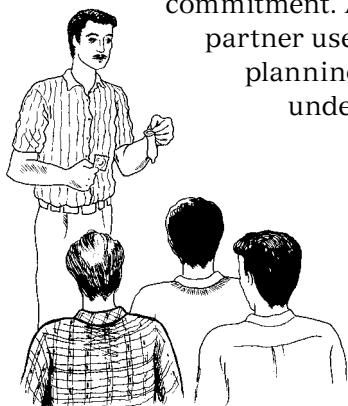
People use family planning when:

- it is affordable or free.
- a variety of different methods are available, so people can choose which works best for them.
- no one is pressured or tricked into using family planning.
- men understand and believe in the benefits of family planning, and listen to what women want.
- anyone who wants to use family planning can get it easily, including people who are younger and older, married and unmarried, and people with disabilities.

Who is family planning for?

Some people think that family planning is only for married women. But both married and unmarried people have sex, and many women want to be able to enjoy sex without worrying about getting pregnant. Also, women do not always have a choice about having sex. Some are pressured, and some are forced. Without family planning, any woman, married or unmarried, young or older, can get pregnant. As a health worker, it is important that you share what you know about family planning with **all** women.

You must also find ways to **share what you know about family planning with men**. Some methods, such as condoms, require a man's commitment. And often a man expects a say in what methods his partner uses. Helping men understand the benefits of family planning can help them overcome their fears about it and understand how family planning helps them too.



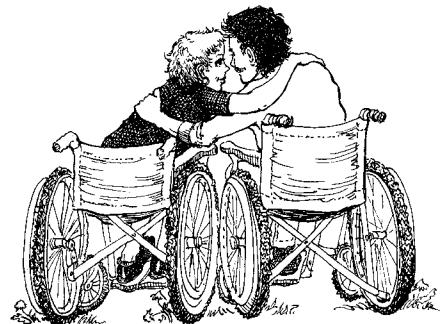
Educating men about family planning also makes it easier for a woman to talk with her husband or partner about family planning, and for them to decide together which method to use. If a man still does not want to use family planning even after learning about the benefits, the woman will need to decide if she wants to use it anyway. There are methods she can use without the man knowing.

Teach how family planning works and what to expect

Explain how to use the different family planning methods correctly and be honest about side effects. A main reason a woman stops using a family planning method is because of uncomfortable side effects. But if she knows what to expect she may be willing to stay with the method until side effects decrease.

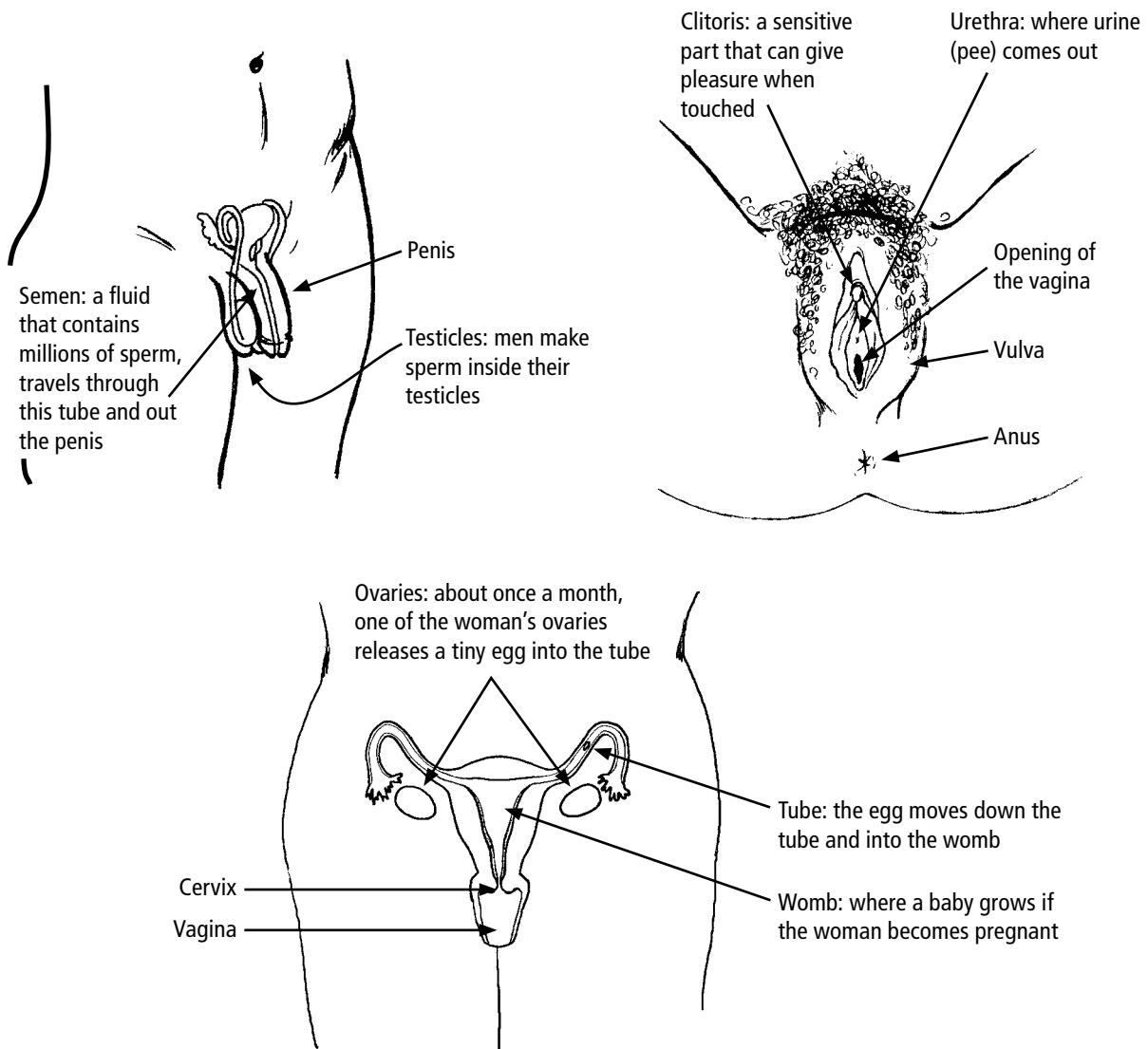
Helping young people

Young people may start romantic or sexual relationships before they have learned about preventing pregnancy. Communities can help young people get the information they need to make good decisions. Schools can give young people health education that covers pregnancy, young adults can be trained to be health educators, and times can be set aside at clinics or other places to give young people advice and methods to prevent pregnancy.



Family planning is for anyone who might get pregnant – but does not want to right now.

How A Woman Becomes Pregnant



When the man ejaculates (comes, climaxes) in or near the vagina, his sperm leave his penis and can get into the womb and tubes. During the woman's fertile time, the sperm can join with the woman's egg. If the sperm fertilizes the egg, it then plants itself in the lining of the woman's womb. This is pregnancy. Family planning methods prevent pregnancy by keeping sperm out of the vagina, or by stopping a woman's body from releasing eggs, or by stopping sperm from joining with an egg.

Sexually transmitted infections

If one person has a sexually transmitted infection (STI), including HIV, having sex can spread it to his or her partner. STIs may cause sores and pain on the penis or vagina, and can cause serious problems that harm the whole body and also a baby at birth. See Genital Problems and Infections (in development) for how to recognize and treat infections that can pass during sex. A person can have a STI and not know it.

Family Planning Methods

This book describes several different kinds of common family planning methods. For information about other, less common methods (patch, diaphragm, and others) see chapter 13 of *Where Women Have No Doctor*, or chapter 17 of *A Book for Midwives*, both available from Hesperian.

How to choose a family planning method

The different family planning methods have different advantages and disadvantages. It may be helpful to talk to your partner, other women, or a health worker about the different methods to help you decide which is right for you. Some things you may want to consider when choosing a family planning method are:

- how well it prevents pregnancy.
- how well it protects against sexually transmitted infections (STIs).
- if your partner is willing to use family planning, or if you must hide it from him.
- if the method is easy to get, and how frequently you must use it.
- how much the method costs.
- if there are side effects.
- if you have other needs and concerns. For example: Are you breastfeeding? Do you have all the children you want?



You have a right to make
your own decisions about
family planning.

Type of Family Planning	Preventing Pregnancy	Protection from STIs and HIV	How often	Other important information
Condoms 	Good	Best	Every time	Most effective when used with a spermicide and a water-based lubricant. A condom needs to be used every time you have sex.
Birth control pill—Combination pill 	Very good	None	Every day	Works best if taken at the same time every day. Women who have the health problems listed on page 12 should not use this method.
Birth control pill—Minipill 	Very good	None	Every day	Will only work if it is taken at the same time every day. Can be used while breastfeeding (start after the baby is 6 weeks old).
Implants 	Best	None	3 or 5 years	Must be inserted and removed by a specially trained health worker and replaced every 3 or 5 years depending on the type.
Injections 	Very good	None	1, 2, or 3 months	Need to be repeated every 1, 2, or 3 months (depending on the type).
IUD 	Best	None	5 or 12 years	Effective for 5 or 12 years (depending on the type). Must be inserted and removed by a specially trained health worker.
Pulling out (withdrawal) 	Least	None	Every time	The man needs to withdraw every time you have sex. Even if he pulls out, some liquid from the penis may enter the vagina during sex, which can cause pregnancy or pass STIs.
Breastfeeding (during the first 6 months only)	Very good	None	Several times a day and at night	This method is only effective if the woman is feeding her baby only breastmilk and if her menstruation has not returned.
Fertility awareness 	Good	None	Every time	This method does not work well for women with irregular menstrual cycles.
Sex without intercourse (penis not inside vagina)	Best	Depends	Every time	If the penis doesn't touch the woman's genitals, she cannot get pregnant. Anal sex can easily pass STIs, oral sex is less likely to pass STIs, and sexual touch rarely passes any.
Sterilization	Best	None	Once	Once a man or woman is sterilized, they will never become pregnant or get someone pregnant.

People choose different methods based on their situation.



I do not want to have to do something every day.

You might **prefer:** Implants, injections, IUD

You might **avoid:** Pills, fertility awareness



I do not want to have to put things in my vagina or womb.

You might **prefer:** Pills, implants, men's condom, fertility awareness

You might **avoid:** Female condom, IUD



I don't want my parents to know I am using birth control.

I do not want any more children.



Raising 2 children is enough for me.



You might **prefer:** Injections, condoms

You might **avoid:** Pills

You might **prefer:** Implants, injections, IUD, male or female sterilization

You might **avoid:** Fertility awareness



I want to have a child in about a year, but not now.



I have had sex with others and want to protect my wife from HIV.

You might **prefer:** Condoms, pills, fertility awareness

You might **avoid:** Implants, injections, IUD, sterilization

You might **prefer:** Using a condom each time

You might **avoid:** Having sex without a condom

The person can use more than one method.



We use fertility awareness, and on my fertile days, we use condoms to prevent pregnancy.



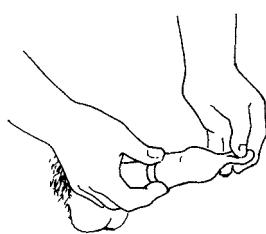
My girlfriend gets injections and we use condoms to prevent STIs.

Condoms

A condom is a thin latex cover the man wears on his penis during sex. The man's semen stays inside the condom, so sperm cannot get into the vagina and cause pregnancy. Condoms are safe and have no side effects.



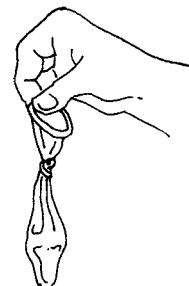
Condoms are also the most effective way to prevent sexually transmitted infections (STIs), including HIV. Even if you are using another method of birth control, you can also use a condom to protect you and your partner from STIs.



Condoms are the only family planning method that is effective at both preventing pregnancy and sexually transmitted infections. But the man must be willing to use one every time he has sex.

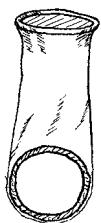
Squeeze the tip of the condom and unroll it all the way over the hard penis. The loose condom tip will hold the man's sperm. (If you do not leave space for the sperm, the condom might break.)

After climaxing, while the penis is still hard, hold the rim of the condom to keep it on your penis while you pull out of the woman's vagina. Then take the condom off the penis. (Put the condom in the trash – do not just throw it where others will come across it!) Use a new condom each time you have sex.



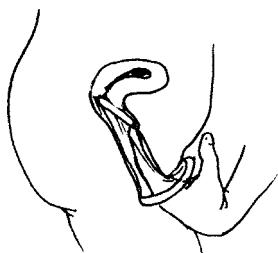
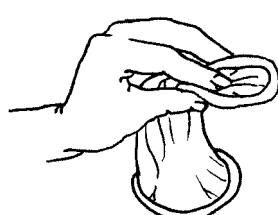
Female Condom

A female condom fits into the vagina and covers the outer lips of the woman's vulva. It is bigger than a male condom and less likely to break. Female condoms protect against HIV and other STIs. Do not use a male and female condom together.



Inner ring goes inside the vagina.

Outer ring stays outside the vagina.



Lubricants

To help keep condoms from breaking, use a water-based lubricant, such as spit (saliva) or *K-Y Jelly*. Do not use cooking oil, baby oil, mineral oil, petroleum jelly (*Vaseline*), skin lotion, or butter with condoms because these oil-based products weaken rubber and can make the condom break. Lubricants can make sex feel more pleasurable for both women and men.

Spermicide

Spermicides are foam, tablets, cream, jelly, or flat strips that dissolve in the vagina and kill sperm so they cannot fertilize an egg.



Spermicide is put into the vagina just before having sex. It does not work well by itself, but gives extra protection against pregnancy when used along with a condom. Spermicide does not protect against STIs or HIV.

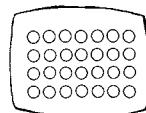
Birth control pills

Birth control pills contain hormones that are similar to the natural hormones in women's bodies. They prevent pregnancy by stopping the woman's ovaries from releasing an egg. There are 2 main types of birth control pills: combination pills which contain two hormones, estrogen and progestin, and minipills which contain only progestin. Some common brand names are shown on page 22. Birth control pills do not protect against HIV or other sexually transmitted infections (STIs). To protect yourself, also use a condom.

Some women choose to take the pill because it helps make their cycles more regular, so they know exactly when they will have their period. The pill also lessens the amount of menstrual blood, and reduces cramping and pain.

Birth control pills do not cause cancer.

Combination pills (pills that have estrogen and progestin)



Different brands of combination birth control pills have different doses of these two hormones (see pages 21 and 22). There are common combinations for standard dose pills such as 1 milligram (mg) or less of progestin and 30 or 35 micrograms (mcg) of an estrogen called ethinyl estradiol.

The minipill is not a combination pill. It contains only progestin. For information about the minipill, see page 14.

The pill is very effective if taken every day at the same time. It is safe for most women.

How to take the combination pill

If you are sure you are not pregnant, you can start taking the pill any time. Pills will not prevent pregnancy until you have been taking them for about a week. So during the first 7 days after starting birth control pills, use condoms or avoid sex.

You must take 1 pill every day to prevent pregnancy, even if you do not have sex on that day. Try to take it at the same time each day. If you keep the pills where you sleep, it may help you remember to take one each night before bed. Most combination pills come in packets of 28 or 21 pills.



Possible side effects of the combination pill

The side effects are not dangerous but some can be annoying. They usually lessen or disappear after about 3 months. Sometimes it helps to try a different brand of pills.

Changes in mood such as being sad or irritable



Headaches



Unexpected light bleeding between normal bleeding times



Swollen, tender breasts

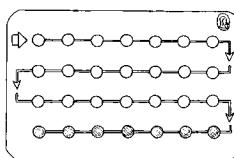


Nausea

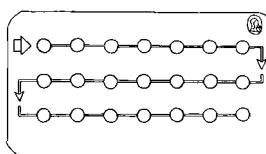


Combination pills can be used 3 ways

28-day use: Take the pills with hormones for 21 days and then for 7 days take the reminder pills (the extra pills in the packet that have no hormones) or take no pills. You will have bleeding each month during those seven days like a normal period.



If you have a 28 day packet, take 1 pill every day. The last 7 pills are reminder pills that have no hormones – they are there to help you remember to take a pill each day. The last 7 pills in the packet will be a different color than the others.



If you have a 21 day packet, take 1 pill every day for 21 days – the whole packet. Then do not take a pill for 7 days. Then start a new packet.

Extended use: Take the pills with hormones for 84 days in a row and then take a 7 day break. Sometimes pills come in packets with 91 pills (84 with hormones and 7 which are reminder pills that have no hormones). During those 7 days, you will have normal bleeding like a period but only once every 3 months. Spotting (very light bleeding) may occur but should go away after a few months.

Continuous use: Take the pills with hormones every day without taking breaks. If bothered by irregular bleeding, stop taking pills for 3 or 4 days in order to have a few days of regular bleeding, and then start taking the pill again every day.

All of these ways of using combination pills are safe. Anyone using combination pills should know what to do if you miss 1 or more pills:

If you forget to take 1 or 2 pills, take 1 pill as soon as you remember. Then take the next pill at the regular time. This may mean that you take 2 pills in one day.

If you forget to take 3 pills, 3 days in a row, take 1 pill right away. Then take 1 pill each day at the regular time. Use condoms until you start your period, or do not have sex until you have taken a pill for 7 days in a row.

If your period does not come on time and you have missed some pills, keep taking your pills, but have a pregnancy test. If you find out you are pregnant, stop taking the pill.

Ending the combination pill

You can stop taking the pill at any time. You could then get pregnant right away, so if you want to avoid pregnancy, use condoms or another method.

Who should not take the combination pill

Some women have health problems that make it dangerous for them to use the combination pill. Do not take combination pills if you have:

- Severe high blood pressure (160/110 or higher). See Heart Disease (in development) for more on high blood pressure.
- Diabetes for more than 20 years.
- If you are over 35 and smoke tobacco.
- Migraines (severe headaches with nausea) if accompanied by numbness or severe vision problems.
- Breast cancer, liver cancer, or uterine cancer. See Cancer (in development).
- Gallbladder disease.
- History of stroke (an attack causing paralysis).
- A blood clot in a vein (this usually causes swelling and pain in one leg).
- Liver disease or hepatitis (see chapter on Belly Pain, page 17).

Most women with any of these health problems can safely use the progestin-only minipill (see page 14) or progestin-only birth control implants or injections instead (page 15). Women with breast cancer or cancer in the womb should not use family planning methods that have hormones, and instead should use another method.

Medicines that interact with combination pills

Rifampicin (a tuberculosis medicine), ritonavir (an HIV medicine) and some epilepsy medicines make birth control pills less effective. If you take these medicines, use a different family planning method. Women who take insulin for diabetes may need to adjust the amount of insulin after starting birth control pills.

Who should consider other methods if available

There are a few other health problems which make the combination pill not an ideal method. It is safer for women with these problems to use another family planning method:

- High blood pressure (over 140/90). See Heart Disease (in development) for more on high blood pressure.
- If you are over 35 and have migraine headaches (severe headaches with nausea).

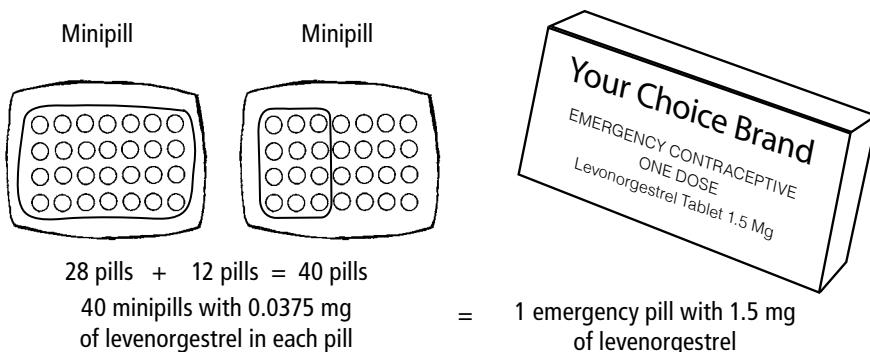
If a woman with these health problems takes the combination pill, monitor her to make sure the problems are not getting worse. If there is no change, it is OK for her to continue using the combination pill. If the problems worsen, she should stop taking the pill immediately.

Emergency contraception

If you had sex without birth control or your condom broke, you can still prevent pregnancy with birth control pills. This is called emergency contraception and it works during the first 5 days after you had sex—the sooner you take it, the better it will work. It works by delaying the woman's eggs from being released so that a pregnancy cannot start. If you are already pregnant, emergency contraception does not stop the pregnancy. Emergency contraception is safe for almost all women.

Special pills for emergency contraception are available in many countries (see page 23). You may need to take 1 or 2 pills – read the instructions carefully.

If these special pills are not available, some kinds of regular birth control pills can be used (see pages 23 to 24). The minipill, for example, has a small amount of levonorgestrel or norgestrel (both of these are kinds of progestin) so taking 40 or 50 pills depending on how much is in each pill, will be the same total amount as one special pill (see pages 23 to 24).

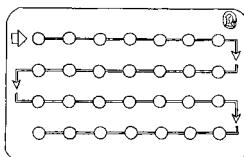


For combination birth control pills, only some can be used for emergency contraception—you must know exactly what is in them and how many to take (usually 4 or 5 pills first and then the same dose 12 hours later, see page 24).

After you have helped a woman with emergency contraception, maybe later you can help her find a family planning method that will work for her.

The Minipill (Progestin-only pills)

This birth control pill does not contain estrogen, only progestin. It is safe for most women who cannot use combined birth control pills and has fewer side effects than combination pills. The minipill does not lessen the milk supply for breastfeeding mothers. Women taking the minipill may have irregular periods, lighter bleeding during periods, or no periods at all.



All the pills in the minipill packet have the same amount of hormone. Take 1 pill every day.

How to take the minipill

Take your first pill on the first day of your period. Then take 1 pill at the same time every day, even if you do not have sex. When you finish a packet, start your new packet the next day, even if you have not had any bleeding. Do not skip a day. Every pill in the packet has the same amount of progestin.

If you take the minipill even a few hours late, or if you forget 1 day's pill, you can become pregnant. If you miss a pill, take it as soon as you remember. Then take the next pill at the regular time, even if it means taking 2 pills in one day. Use condoms or do not have sex for 7 days. You may bleed a little if you miss your minipill or take it late.

Possible side effects of the minipill

The most common side effect of progestin-only minipills is changes in monthly bleeding. You may have bleeding when you do not expect it. Your period may go away altogether. This is not dangerous. Other possible effects include weight gain, headaches, and acne (pimples).

Medicines that interact with the minipill

Rifampicin (a tuberculosis medicine), ritonavir (an HIV medicine), and some epilepsy medicines make birth control pills less effective. If you take these medicines, use a different family planning method. Women who take insulin for diabetes may need to adjust the amount of insulin after starting birth control pills.

Ending the minipill

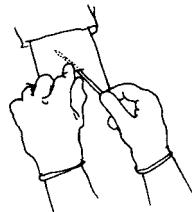
If you want to get pregnant or change methods, you can stop taking the minipill at any time. You might be able to get pregnant as soon as you stop, so if you want to avoid pregnancy, start another method immediately.

Implants and Birth Control Injections

Implants are small plastic tubes that a health worker places under the skin on the inside of a woman's arm. They prevent pregnancy for 3 to 5 years, depending on the type of implant.



Birth control injections are given by health workers once every 1, 2, or 3 months, depending on the type of injection



Implants and injections are easy to keep private, and the woman does not have to remember to take a pill every day. All implants and some injections are progestin-only. One kind of injection (monthly injections) has both progestin and estrogen, so this kind should not be used by women who cannot take combination birth control pills (see page 12). A woman can decide to stop injections or remove implants at any time if she wants to become pregnant. Neither implants nor injections give any protection against STIs including HIV.

Possible side effects of implants and injections

Monthly injections may have side effects similar to combination pills, see page 10. Implants and progestin-only injections have the same side effects as progestin-only minipills, see page 14.

Medicines that interact with implants and injections

Ritonavir (an HIV medicine) may make monthly injections less effective, and rifampicin (a TB medicine) and some epilepsy medicines make both implants and injections less effective. If you take these medicines, use a different family planning method. Women who take insulin for diabetes may need to adjust the amount of insulin after starting implants or injections.

Ending implants or injections

To stop using implants, have them removed by a trained health worker. A woman can get pregnant right away after having an implant removed. To stop using injections, simply stop getting the injections. It may take longer for a woman to get pregnant after stopping injections, but most women can get pregnant within 1 year.

The IUD



An IUD (Intra-Uterine Device) is a small plastic, or plastic and copper, object put into the womb by a trained health worker. It prevents the man's sperm from fertilizing an egg, and also prevents the egg from implanting in the womb. For information on inserting an IUD, see chapter 21 of *A Book for Midwives*, available from Hesperian.

IUDs are very effective, and can stay inside the womb for as long as 5 or 12 years, depending on the type. IUDs do not protect against HIV or other sexually transmitted infections.

IUDs are safe for both women who have been pregnant and those who have never been pregnant. An IUD can be inserted any time the woman is not pregnant and does not have a vaginal infection or STI. An IUD can also be removed by a trained health worker at any time. After it has been removed, a woman can become pregnant right away.

Once inserted in the womb, it is unlikely for an IUD to come out but not impossible. Once a month, you can check if the IUD's strings that hang from the cervix are still there by reaching into your vagina and feeling for them (but not pulling on them). If you cannot feel the strings or if you think the IUD has come out, use condoms or avoid having sex until you check with a health worker.



Possible side effects of using an IUD

The most common side effect is heavier, more painful monthly bleeding. This may be uncomfortable but it is not dangerous and will usually lessen after a few months. Some kinds of IUD contain the hormone progestin, which can help reduce the discomfort and bleeding. IUDs with progestin can cause the same side effects as the minipill (see page 14).

Who should not use an IUD

- Women with cancer of the cervix or uterus (womb). Women with breast cancer should not use the IUD that has progestin, but they can safely use the IUDs with copper.
- Women with gonorrhea, chlamydia, or pelvic infection (PID). For more on gonorrhea and chlamydia, see Genital Problems and Infections (in development). For more on PID, see page 16 of Belly Pain, Diarrhea, and Worms.

Starting birth control after having a baby

It is healthy for women who have a baby to wait until their body feels fully healed before having sex. When sexual relations begin again, if you give your baby only breastmilk and menstruation has not returned, breastfeeding can prevent pregnancy for up to 6 months after giving birth (see below). With only some breastfeeding or no breastfeeding, a woman can get pregnant within the first month after childbirth. Whether or not the new mother is breastfeeding, she and her partner can use condoms to prevent STIs and pregnancy any time after the baby is born. Mothers who are breastfeeding can have an implant put in, start the minipill, or use progestin-only injections once the baby is 6 weeks old. Breastfeeding mothers can start using combination pills or monthly injections once the baby is at least 6 months old. If a woman is not breastfeeding, she can start using any method 4 weeks after giving birth. Most women can have an IUD put in or have their tubes tied (sterilization) either within 2 days of delivery or a few weeks later.

Natural Methods of Family Planning

Breastfeeding

When a woman breastfeeds, her body produces hormones that prevent pregnancy for a few months. Breastfeeding is dependable for preventing pregnancy when:

- The baby is less than 6 months old.

AND

- You are giving your baby only your breast milk, no other food or drink, and you feed your baby often, day and night.

AND

- You have not had monthly bleeding since giving birth.

Once you start giving your baby food or you get your period, breastfeeding will no longer prevent pregnancy.



Fertility Awareness

A woman can only get pregnant during her fertile time, when an egg comes from her ovary into her tube and womb. This time lasts for several days and happens about once a month. By avoiding sex during the fertile time, she can prevent pregnancy. (Or, if a couple is trying to get pregnant, they can plan to have sex during this time to increase chances of pregnancy.)

For this method to work, the woman must have regular menstrual cycles, and must keep good track of each stage of her cycle. The man must be willing to help make this method work too, because during fertile times, they must avoid sexual intercourse (sex with the penis inside the vagina). They can have other types of sex, like oral sex or sexual touching. Or they can use condoms during the fertile time.

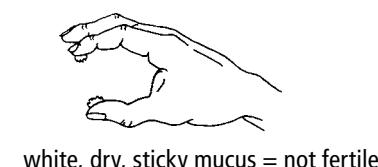
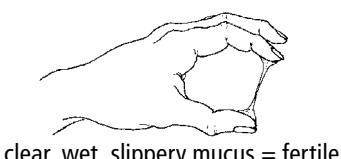
This can be a good method for a woman who wants to limit the number of children she has. But sometimes the menstrual cycle changes unpredictably. People do not always keep track well so it is common to get pregnant using this method. Fertility awareness does not give any protection against STIs including HIV, which can be passed at any time of the woman's cycle.

How to use fertility awareness

Count the number of days of your menstrual cycle for a few months. Start counting on the first day of your menstrual period. The last day of the cycle is the last day before you bleed again. If you have about the same number of days in each cycle, and your cycles last between 26 and 32 days, this method can work.

Once you have counted your cycle for a few months and are sure your cycle is usually regular, then you can start using this method. Avoid sexual intercourse from the 8th day to the 19th day of every cycle. Or use condoms during that time. You must continue to keep good track of how many days have passed every cycle for this to work. If your cycle changes, use another method until your cycle becomes regular again for several months.

A woman's body produces wet mucus in her vagina during her fertile time to help the sperm get to the womb. So checking the mucus every day can also help her know when she is in her fertile time.



Withdrawal, pulling out

When a man pulls his penis out of the woman and away from her genitals before he ejaculates (comes), they may be able to avoid pregnancy if the man is very good at controlling himself and is committed to doing so. It does not work well for men who ejaculate unpredictably. Even if the man does pull out, some liquid that contains sperm may leak out of his penis and cause pregnancy. This method is probably not a good choice for people who are certain they do not want pregnancy. Pulling out does not protect against STIs.

Sex without intercourse

There are many ways to be close to someone, to have sexual pleasure, and to show love besides sexual intercourse. Many couples practice oral sex: using your mouth to bring pleasure on the penis or the vulva. You cannot get pregnant this way.



Sex in the anus (anal sex) also cannot cause pregnancy. But you can pass STIs, including HIV, during anal and oral sex. Using your hands to make someone feel good sexually is very safe. It cannot cause pregnancy and it cannot pass any STIs.

Methods That Do Not Work

These methods are useless or harmful:

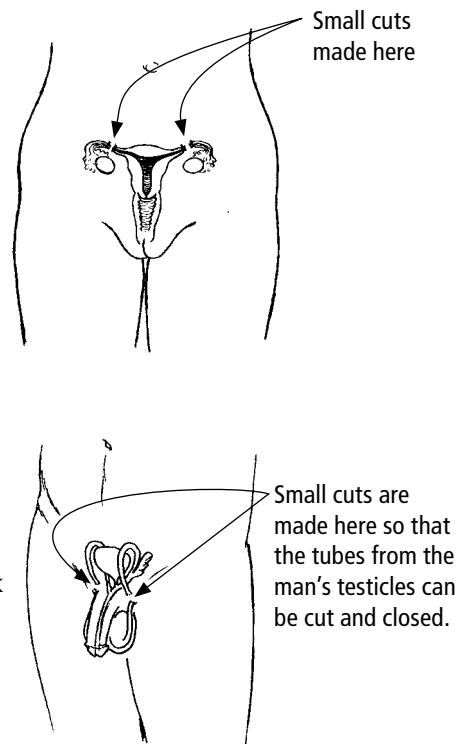
- Urinating (peeing) after sex is not harmful, but it does nothing to prevent pregnancy. Urine comes out of a different hole than the vagina.
- Putting in herbs, plants, chemicals, or anything that dries the vagina does not prevent pregnancy. But it can harm the vagina, making it easier for women to get infections.
- Washing out the vagina (douching) after having sex does not prevent pregnancy. Sperm move very fast and some will reach the inside of the womb before they can be washed out. Douching can even push sperm up into the womb.
- Amulets and prayers do not prevent pregnancy. Women who rely on these methods get pregnant.

Sterilization, Surgery

For those who never want to have more children, sterilization is a safe, simple operation for both men and women. In many countries these operations are free. Ask at the health center. Sterilization does not protect against STIs, including HIV.

For women, the operation is called a tubal ligation, which means to tie the tubes. One method is to make a small cut near the belly button so that the tubes coming from the ovaries (where eggs are produced) can be cut and closed. It usually can be done in a doctor's office or health center without putting the woman to sleep. This operation has no effect on the woman's menstrual periods or sexual ability, and may make having sex more pleasant because she does not have to worry about pregnancy.

For men the operation is called a vasectomy. It can be done simply and quickly in a doctor's office or a health center without putting the man to sleep. This operation is even safer and faster than the surgery for a woman. The testicles are not removed and the operation has no effect on the man's sexual ability or pleasure. His fluid (semen) comes just the same, but has no sperm in it.



Family Planning: Using birth control pills

Birth Control Pills (Oral Contraceptives)

Most birth control pills contain 1 or 2 hormones similar to the hormones that a woman's body normally makes. These hormones are called estrogen and progestin.

Birth control pills come in different strengths of each hormone and are sold under many different brand names. The first 3 types of pills on the next page have both estrogen and progestin (see combination pills, page 10) and the fourth type has progestin only (see minipill, page 14).

A very common kind of estrogen is called ethinyl estradiol. The most common dose is 35 mcg (micrograms). The most common amount of progestin in combination pills is 0.1 mg (milligrams).

Women who take birth control pills usually have lighter monthly bleeding than they would without the pills. This may be a good thing, especially for women who are anemic. But if a woman has no monthly bleeding or very light monthly bleeding for months and does not like this side effect, she can try changing to a brand with more estrogen.

All birth control pills work best at preventing pregnancy if taken at the same time every day. That also makes it easier to remember to take them. It is especially important to take the progestin-only pill (minipill) at the same time each day because for this pill, there is an increased chance of pregnancy if a woman forgets to take even 1 pill.

With a 28-day pack, take 1 every day and start a new pack right after finishing. A 28-day pack may have 21 pills that contain hormones along with 7 reminder pills that do not have any hormones. These reminder pills (also called placebo pills) are there to help the person remember to take a pill every day. Some 28-day packs, however, have only the pills with hormones. With a 21-day pack, take one each day and then wait seven days before starting the next pack (unless you are using pills continuously in order to have fewer periods, see page 11).

COMBINATION PILLS WHERE THE DOSE OF HORMONE CHANGES

These pills contain a mix of estrogen and progestin that changes throughout the month. Since the amounts change, it is important to take the pills in order.

Some brand names:	<i>Gracial, Logynon, Qlaira, Synphase, Trinordiol, Trinovum, Triquilar, Triphasil</i>
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COMBINATION PILLS WITH FIXED DOSES: BOTH ESTROGEN AND PROGESTIN

These contain estrogen (usually 35 mcg) and progestin (usually 0.1 mg). A 28-pill pack has 21 pills with hormones and 7 reminder (placebo) pills. A 21-pill pack has only pills with hormones. The amount of each hormone is the same in the 21 pills in both types of pack.

Some brand names:	<i>Alesse, Cilest, Diane, Femoden, Gynera, Harmonet, Norinyl, Ortho-Novum, Ovysmen</i>
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COMBINATION PILLS WITH FIXED DOSES: MORE PROGESTIN, LESS ESTROGEN

These pills are higher in progestin (0.15 mg) and lower in estrogen (30 mcg). A 28-pill pack has 21 pills with hormones and 7 reminder (placebo) pills. A 21-pill pack has only pills with hormones. The amount of each hormone is the same in all 21 pills in both types of pack. These pills may work better for a woman who has very heavy monthly bleeding or whose breasts become painful before her period begins.

Some brand names:	<i>Lo-Femenal, Lo/Ovral, Microgynon, Microval, Nordette</i>
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PROGESTIN-ONLY PILLS (MINIPIILLS)

These pills contain only progestin and come in 28-pill packs. All of the pills in the pack have the same amount of progestin.

Some brand names:	<i>Femulen, Microlut, Micronor, Micronovum, Neogest, Microval, Ovrette, Exlutan</i>
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Emergency Family Planning (ECP, emergency contraceptive pills)

You can use emergency contraceptive pills or some brands of regular birth control pills to prevent pregnancy within 5 days after unprotected sex. The number of pills you need to take depends on which hormones and the amount of hormones each pill contains. This chart lists only a few common brands for each type of pill. Make sure you know the type and amount of hormone in the pills before you use them. The chart shows the total dose of hormones needed and how many pills you would need to take to reach that dose. There are many brands of pills, and some brand names are used for more than one type of pill.

Common side effects of ECP are headaches, nausea or pain in the belly, but these should go away in a day or two. It is also normal to have slight bleeding or a change in timing of your next monthly bleeding. When using emergency family planning, the special emergency pills or the correct dose of the progestin-only pills (minipill) will cause fewer side effects than using regular combination birth control pills. If you vomit within 1 hour of taking the dose, this means you need to repeat that same dose. Never mix different kinds of emergency contraceptive or other birth control pills together because that could make them not work at all.

How to take pills for emergency family planning

HOW TO TAKE SPECIAL PILLS FOR EMERGENCY CONTRACEPTION		
Emergency pills containing 1.5 mg (1500 mcg) levonorgestrel <i>(NorLevo 1.5, Plan B One-Step, Postinor-1)</i>	Take 1 pill, one time only	
Total dose of 1 pill = 1.5 mg (1500 mcg) levonorgestrel		
Emergency pills containing 30 mg ulipristal acetate <i>(ella, ellaOne)</i>	Take 1 pill, one time only	
Total dose of 1 pill = 30 mg ulipristal acetate		
Emergency pills containing 0.75 mg (750 mcg) levonorgestrel <i>(NorLevo 0.75, Optinor, Postinor, Postinor-2, Plan B)</i>	Take 2 pills, one time only	
Total dose of 2 pills = 1.5 mg (1500 mcg) levonorgestrel		
Emergency pills containing 0.05 mg (50 mcg) ethinyl estradiol and 0.25 mg (250 mcg) levonorgestrel <i>(Tetragynon, Neogynon, Nordiol)</i>	First take 2 pills	Then take 2 more pills 12 hours later
Total dose of 4 pills = 0.2 mg (200 mcg) ethinyl estradiol and 1.0 mg (1000 mcg) levonorgestrel		

HOW TO TAKE COMBINATION PILLS FOR EMERGENCY CONTRACEPTION

With a 28-day packet of 28 combination pills, use any of the first 21 pills to come up with the dose below but do not use the last 7 pills because they may be reminder pills and not contain any hormones.

Combination pills containing 0.03 mg (30 mcg) ethinyl estradiol and 0.15 mg (150 mcg) levonorgestrel (<i>Anna, Combination 3, Gestrelan, Microgynon, Microgynon-30, Nordette, Roselle</i>) Total dose of 8 pills = 0.24 mg (240 mcg) ethinyl estradiol and 1.2 mg (1200 mcg) levonorgestrel	First take 4 pills	Then take 4 more pills 12 hours later
Combination pills containing 0.03 mg (30 mcg) ethinyl estradiol and 0.3 mg (300 mcg) norgestrel (<i>Lo-Feminal, Lo/Ovral</i>) Total dose of 8 pills = 0.24 mg (240 mcg) ethinyl estradiol and 2.4 mg (2400 mcg) norgestrel	First take 4 pills	Then take 4 more pills 12 hours later
Combination pills containing 0.02 mg (20 mcg) ethinyl estradiol and 0.1 mg (100 mcg) levonorgestrel (<i>Alesse, Loette, Lutera, Miranova</i>) Total dose of 10 pills = 0.2 mg (200 mcg) ethinyl estradiol and 1 mg (1000 mcg) levonorgestrel	First take 5 pills	Then take 5 more pills 12 hours later

HOW TO TAKE PROGESTIN-ONLY PILLS (MINIPIILLS) FOR EMERGENCY CONTRACEPTION

In the packets of progestin-only minipills, every pill has the same dose of hormone.	
Progestin-only pills (minipills) containing 0.075 mg (75 mcg) norgestrel (<i>Ovrette, Minicon</i>) Total dose of 40 pills = 3 mg (3000 mcg) norgestrel	Take 40 pills one time only (many pills, but safe)
Progestin-only pills (minipills) containing 0.0375 mg (37.5 mcg) levonorgestrel (<i>Neogest, Norgaeal</i>) Total dose of 40 pills = 1.5 mg (1500 mcg) levonorgestrel	Take 40 pills one time only (many pills, but safe)
Progestin-only pills (minipills) containing 0.03 mg (30 mcg) levonorgestrel (<i>Microlut, Microval, Nortrel</i>) Total dose of 50 pills = 1.5 mg (1500 mcg) levonorgestrel	Take 50 pills one time only (many pills, but safe)

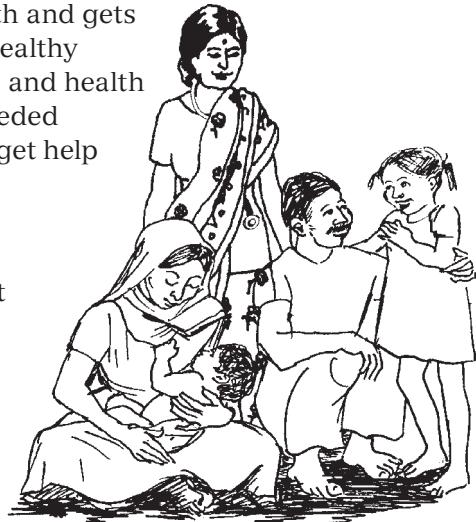
Pregnancy and Birth

When a pregnant woman is in good health and gets the care she needs she will likely have a healthy pregnancy and baby. Mothers, midwives, and health workers can maintain the good health needed during pregnancy, and prevent, treat, or get help for problems if they arise.

Signs of pregnancy

A woman usually guesses she is pregnant when she notices some of these signs:

- No menstrual bleeding
- Nausea
- Feeling tired
- Urinating more often
- Tender, growing breasts
- Weight gain



A blood or urine pregnancy test can tell for sure starting about 2 weeks after the woman becomes pregnant (a month after the start of the last menstruation).

By about 4 ½ months of pregnancy, the mother can feel the baby move and a health worker can hear the baby's heartbeat with a fetoscope.

When will the baby be born?

Pregnancies last about 9 months (10 moon cycles, or 40 weeks). To figure out when the baby is likely to be born:

Add 9 months plus 7 days to the first day of the last normal menstrual bleeding. That is the due date. Most babies are born between 3 weeks before to 2 weeks after this date.

For example, suppose the woman's last period started February 10.

$$\text{February 10th} + 9 \text{ months} = \text{November 10th}$$

$$\text{November 10th} + 7 \text{ days} = \text{November 17th}$$

The baby's due date is November 17th.



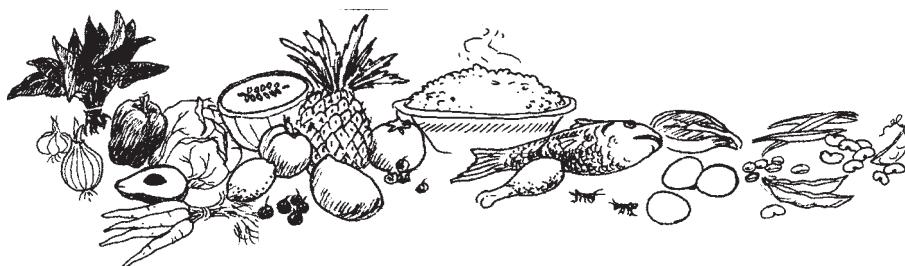
How to Stay Healthy During Pregnancy

The mother and her baby can stay healthy with:

- enough nutritious food.
- plenty of rest each day.
- avoidance of chemicals, alcohol, smoke, and most medications.
- care from a midwife or other health worker who can treat, or get help to treat, any health problems that may occur.
- love and kindness.

Eat enough nutritious foods

A mix of nutritious food will keep the woman strong and healthy, so she can have energy for the birth and to care for the baby. If a pregnant woman does not eat enough, it may be that she is saving food for others in the family, or that a well-meaning mother-in-law or friend has told her to avoid certain foods or that staying small will make the birth easier. Remember, a pregnant woman must eat enough for herself and for the baby, so she needs more food than other adults, not less. Pregnant women, like everyone, need a mix of protein, vegetables, fruits, and starches. And they should eat more often, snacking throughout the day. For advice on how to eat well, see Good Food Makes Good Health.



A variety of foods keeps the mother and baby healthy.

Prevent anemia

Anemia (lack of iron in the blood) is common during pregnancy. It leads to a feeling of tiredness. Anemia is especially dangerous for pregnant women because blood is lost during birth. This can make the anemia so severe the woman can die. Prevent anemia by eating protein and iron-rich foods and taking iron tablets. See page 38 for more information about iron and iron supplements.

Malaria (see Some Serious Infectious Diseases – in development) and hookworm (see page 36 in Belly Pain, Diarrhea, and Worms) can cause anemia and should be treated right away.



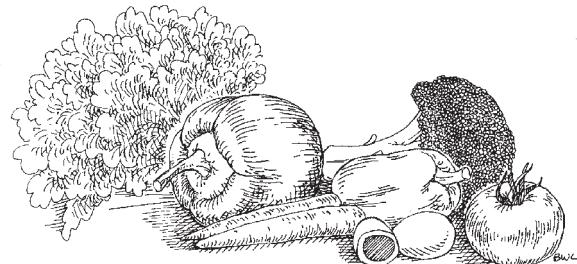
Pregnant women need iron-rich foods.

Folic acid

Lack of folic acid (folate) can cause deformities and disabilities in the baby. Choose an iron supplement that includes folic acid, or take a separate folic acid supplement. Read more about folic acid on page 39.

Vitamin A

Orange and green vegetables and fruits contain vitamin A, a nutrient needed to keep the eyes healthy. A pregnant woman needs extra green and orange vegetables and fruits because the vitamin A she eats goes to meet the baby's needs first. Lack of vitamin A can cause night blindness or blindness in general. See page 9 in the Good Food Makes Good Health chapter.



Rest

Encourage family and neighbors to share the work and responsibilities of the pregnant woman. Remind her, especially as she gets farther along in her pregnancy, to rest and put her feet up a few times a day or to lie down in the afternoon. Growing a baby is work for the body and it needs rest.

Avoid harmful substances

Smoke and tobacco

Cigarettes and tobacco harm the mother's lungs and can cause cancer and death. Smoke can cause babies to be born early or small, or born dead. Mothers and babies can even be harmed by other people smoking nearby. Remind family and others to avoid smoking in the same room or car with a pregnant woman or children.

Don't smoke in the house man, my sister is pregnant!



Alcohol and drugs

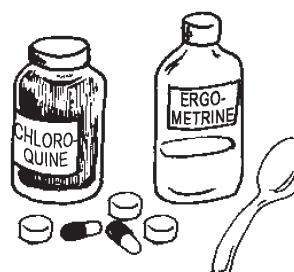
When a pregnant woman drinks alcohol it passes to her baby and can permanently damage the baby's brain and body. The more alcohol she drinks, the more harm is caused. Likewise, cocaine, methamphetamine, heroin, and other drugs are harmful to pregnant women and to their babies. See Drugs, Alcohol, and Tobacco (in development) for help with drugs and alcohol.

Medicines

Most medicines, when taken by a pregnant woman, also pass to her baby. And because babies are so small and still developing, medicines that are safe for an adult can cause birth defects or other harm to the baby. So pregnant women should avoid most medicines. Rest and fluids — not medicines — are the best treatment for minor problems like headaches, stomach aches, and colds.

But some illnesses are too harmful to leave untreated throughout pregnancy. The illness may be dangerous to the baby too. Illnesses in pregnant women that should always be treated with medicines include:

- malaria. See Some Serious Infectious Illnesses (in development).
- HIV or AIDS. See HIV and AIDS (in development).
- urinary tract infections. See Difficulties with Urinating (in development).
- sexually transmitted infections such as chlamydia, gonorrhea, and syphilis. See Genital Problems and Infections (in development).



Unless you are sure they are needed, it is best to avoid medicines during pregnancy.

To know if a particular medicine is safe in pregnancy and during breastfeeding, ask an experienced health worker, check the medicines pages at the end of this chapter, or look in other medicine guidebooks. If a medicine that is needed is unsafe, there is usually another medicine that can be used instead.

Traditional and plant medicines can also do more harm than good. Medicines, Tests, and Treatments (in development) suggests ways to decide when considering the use of traditional medicines.

Avoid sick people

Being sick while pregnant is miserable. It can make eating difficult too, and not getting enough food drains the woman of energy. Avoid sick people to prevent getting sick yourself.

German measles (rubella) is a sickness that is not usually a serious problem, but when it strikes a pregnant woman it can cause deformities and disabilities in a baby inside the womb. To protect the baby, a pregnant woman should avoid people with rashes, especially children, who often get these infections. Even a pregnant woman's own sick children should be cared for by other family members or friends. A community-wide vaccination program is the best protection for all women.



Care from a midwife or other health worker

An experienced midwife or other health worker can advise a pregnant woman on how to stay healthy and safe, treat common problems and discomforts, and recognize when a pregnant woman needs help at a hospital or medical center. All women should get care from a compassionate, knowledgeable health worker during pregnancy, birth, and in the weeks that follow.

Vaccinations

A pregnant woman should be vaccinated against tetanus as early as possible in pregnancy. She should get a second booster 4 weeks later if she may not be fully up-to-date on her vaccinations. This protects both the woman and her baby. For more details, see Vaccines (in development).

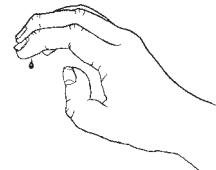
Laboratory tests

Simple tests can diagnose many of the diseases that are most harmful to pregnant women and their babies. These tests alert the mother and health worker to start treatment right away, which can prevent serious problems during or after the birth. It is wise to test for:

- anemia (with the hemoglobin or hematocrit test).
- syphilis.
- malaria (using rapid tests where malaria is common).

HIV testing should be available for all pregnant women. When a woman learns she has HIV, she can take medicines that can keep her healthy and protect her baby from the virus. The chapter HIV and AIDS (in development) includes information on testing and the medicines that pregnant women with HIV should take.

There are new versions of these tests that do not require a lab and are easily done by swabbing the inside of the mouth or vagina, or taking a tiny amount of blood from a prick of the finger. Ask at a local health center if these tests are provided by the government, or if there is a local organization that offers them.



Discomforts of Pregnancy

Pregnancy can bring problems that are uncomfortable but not dangerous. Avoid medicines for these discomforts. You can treat many of them simply and safely with home remedies.

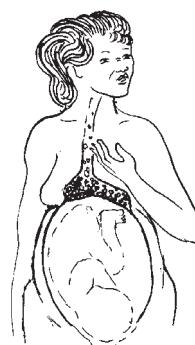
Nausea

An empty stomach makes the nausea of pregnancy worse. Eat small amounts, many times a day. Try eating a protein food like nuts, cheese, or meat before bed to keep full through the night. Eat something plain, such as rice, bread, or tortilla in the morning even before getting out of bed.

Fatty foods, spices, and strong-smelling foods may make nausea worse. Mint or ginger tea can help.

Heartburn

Heartburn is common in pregnancy. See page 12 in Belly Pain, Diarrhea, and Worms for ideas about how to prevent and treat it.



Changing hormones and a growing baby push stomach acid into the chest, causing burning and pain.

Constipation and hemorrhoids

Pregnant women often have trouble passing stool. This constipation can be very uncomfortable.

Straining to pass stool can cause hemorrhoids (also called piles). These are swollen veins around the anus. Hemorrhoids cause itching, pain, or bright-red bleeding. Page 39 in Belly Pain, Diarrhea, and Worms explains how to prevent and treat constipation and hemorrhoids.

Tiredness

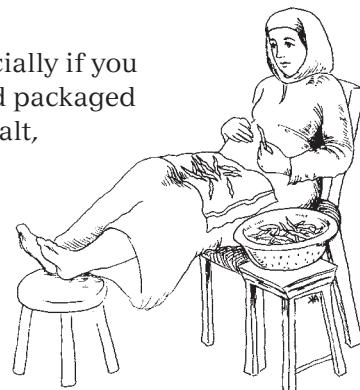
Women feel more tired during pregnancy simply because their bodies need more rest. This is normal. Rest and nap when you can.

Tiredness can be a sign of anemia, which is common but not healthy in pregnancy. Eat more iron-rich foods (such as meat, beans, lentils, and greens) and take iron tablets.

Swollen feet or hands

Rest and put your feet up a few times a day, especially if you spend most of the day standing or walking. Avoid packaged or canned foods — these usually have too much salt, which makes swelling worse.

Swelling when you first wake in the morning or swelling all over, including the face, are signs of pre-eclampsia. Check your blood pressure immediately, and even if it is OK, continue to have it checked at least once a week for the rest of the pregnancy. See page 15.



Feelings about sex

Feelings about sex may change during pregnancy. Some pregnant women do not want much sex, others want more sex than usual. These are both normal.

Having sex will not harm the woman or the baby, but a pregnant woman and her partner may need to try different positions for sex that are more comfortable. If a woman has gone into early labor in other pregnancies, avoiding sex after the 6th month may help prevent going into labor too early this time.

Caring for Pregnant Women

The rest of this chapter offers instructions especially for midwives and health workers caring for pregnant women and babies. (Mothers can use this information too, to understand what is normal and what is dangerous.)

A midwife or other health worker should meet with a pregnant woman several times during the pregnancy. After about 8 months, meet every week. At these meetings, the midwife can:

- answer questions.
- teach about healthy eating, rest, and other needs of pregnant women.
- check health signs that show whether the mother and baby are well or need help.

Write down what you learn at each visit so you can answer such questions as, "is this mother gaining enough weight to support her baby?" and "is her blood pressure staying the same or getting higher?" (Rising blood pressure can mean pre-eclampsia.)



⚠ Danger Signs In Pregnancy

Go to a medical center or hospital if you find any of these signs of serious health problems. They can endanger a pregnant woman's life.

- **Bleeding from the vagina:** Bleeding, like during a menstrual period, in the first few months of pregnancy is a sign of losing the pregnancy. Later in pregnancy, a little bleeding can be a sign of the placenta separating from the womb. This is an emergency. Get medical help.
- **Severe pain** in the first 3 months of pregnancy can be caused by a pregnancy outside the womb. See page 10 in Belly Pain, Diarrhea, and Worms, and get to a hospital right away. Severe pain late in pregnancy or during labor can be the placenta separating from the womb. This is an emergency, get medical help.
- **High fever** (above 39°C or 102°F) is a sign of infection that can harm the mother or her baby. Fever in pregnancy can be caused by flu, malaria (see Some Serious Infectious Illnesses – in development), kidney infection (see Difficulties with Urinating – in development), womb infection (page 32), or any other illness that causes fever.
- **High blood pressure** (140/90 or more), severe headaches, and severe swelling of the face are signs of pre-eclampsia. See pages 15 to 16.
- **Seizures** can be caused by eclampsia. Get her to a medical center quickly. See page 16.

Record of prenatal care

Name of mother: _____ Age: _____ Number of children: _____ Date of last childbirth: _____
Date of last monthly bleeding: _____ Probable due date: _____ Problems with other births: _____

date of visit	month of pregnancy	general health	anemia	weight	temperature	pulse	blood pressure	signs of infection	protein in urine	size of womb	position of fetus	baby's heart beat
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Questions to ask a pregnant woman

At the first meeting, ask questions to learn about the mother's health. Add to this list of questions, depending on the health problems in your own community.

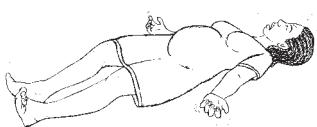
- ? How long has she been pregnant? When is the baby due?



- At each meeting, figure out how many weeks pregnant the woman is. Recheck the day her last menstrual period started, and count how many weeks have passed since then.
- Knowing how far along the pregnancy is will tell you if the baby is growing enough.

How were the previous pregnancies?

- ? Did she have high blood pressure or seizures?



- High blood pressure or seizures (fits) during pregnancy may have been pre-eclampsia. Meet with this woman at least once a week after week 28 of pregnancy. At each meeting, check her blood pressure and check her urine for protein. Plan how you will get medical help fast if she needs it. See page 18.

- ? Did any babies die before birth? Why?



- There are many possible causes of a baby's death during late pregnancy. Diabetes is one possible cause, so check the mother for signs of diabetes (see Chronic Illnesses - in development). But most often, no one ever knows the cause, and even the known causes may not happen again. No matter the cause, listen to this mother's story with kindness.

How were the previous births?

- ? Did she bleed a lot after a previous birth?



- Find a way for the woman to have this baby in a well-equipped hospital. If that is not possible, have medicines ready to treat bleeding at home. See page 30.

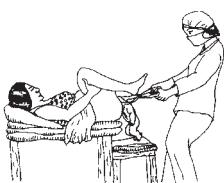
? Has she had very quick labors – or very slow ones?

- If she had fast labors in the past, get to this birth as quickly as you can or have a plan for how to get her quickly to a clinic.
- If she has had slow labors, she may have a small pelvis or another problem. Be ready to go to the hospital if this labor is slow too.

? Have any of her babies been very small? Have they been very big?

- Small babies can get breathing problems and infections more easily. Try to help the mother grow a bigger baby this time. If food is scarce, can you find ways to get her more?
- Cigarette smoke and other poisons can also keep the baby small. What needs to change to protect the mother and baby from harm?
- A large baby, over 4 kg, can be a sign of diabetes. See Chronic Illnesses (in development).

? Did she have any births by surgery – called cesarean births? Has she had births with forceps? Does she know why?



- A cesarean or forceps delivery may have been necessary because of a very slow labor, which might happen again. Was the labor long too? If not, a cesarean may have been unnecessary.
- It is possible to have a vaginal birth after a cesarean. But it is best to try in a hospital in case of a problem.

? Did any babies die in the weeks after the birth?

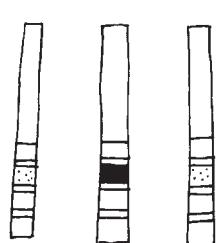
- Newborn death has many causes. Tetanus, pneumonia, diarrhea, and sepsis are some common causes that can all be prevented. Learn how to prevent and treat these infections in the Newborn Babies and Breastfeeding chapter.

? Did she have trouble breastfeeding?

- To help with breastfeeding, see page 18 of Newborn Babies and Breastfeeding.

How is her health now?

- ?
 - Does she have any serious infections, like malaria, TB, HIV, or others?

Look for ongoing health problems that are not getting better such as a lasting cough, fevers, or weight loss.
- Any serious infection must be treated.
- 
-
- ?
 - Does she have itching, sores, a bad smell, or yellow discharge from the vagina?
Does she have pain inside the vagina or lower belly when she has sex?
- An increase in white or clear discharge from the vagina is normal in pregnancy. But discharge that smells bad or pain in the vagina are signs of infection. See Genital Problems and Infections (in development).
-
- ?
 - Does she have pain or burning when she urinates? Or pain on the sides or in the middle of the back?
- Check for urinary tract infection (bladder infection), see Difficulties with Urinating (in development).
- 
-
- ?
 - Has she had any bleeding from the vagina?
- Bleeding before 20 weeks is usually a loss of the pregnancy, and is usually not dangerous to the woman's health. Bleeding after week 20 (4 ½ months) is an emergency. Get help.
- 
-
- ?
 - Does the mother have diabetes (too much sugar in the blood)?
- Diabetes is explained in Chronic Illnesses (in development). A woman with diabetes should continue to take her insulin during pregnancy. It is important to check the blood sugar after each meal, if she can. She will need medical help to have a safe birth.
- It is also possible to get diabetes of pregnancy, called gestational diabetes. Check the urine for sugar with urine test strips. If she has sugar in the urine, she needs a blood test for diabetes.
- 
- Urine dipsticks

? Is she taking any medicines?



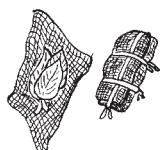
→ Use the Index of Medicines (in development) or another reference to learn about any medicines the woman is taking. Ask yourself, "is this medicine necessary?" and, "is it safe in pregnancy?" If it is necessary but not safe, look for another, safe medicine she can use instead.

? Is she allergic to any medicines?



→ Note any medicine allergies. Avoid giving her medicines to which she is allergic and plan to use another, safer medicine if necessary.

? Does she take herbs or natural medicines?



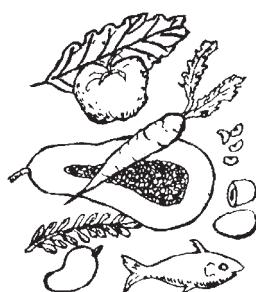
→ Some plant medicines can cause harm in pregnancy. See Medicines, Tests, and Treatments (in development) for help deciding which may be safe.

? Are strong chemicals used in her home or work?
Of particular danger are pesticides, strong cleansers, and chemicals and materials used in factories.

→ Strong chemicals can be dangerous for everyone. Some can also cause a baby to be born with disabilities or be born dead. How can you help protect this mother from dangerous chemicals?



? What does she eat on a normal day?



→ Use the Good Food Makes Good Health chapter to talk with the woman about how to eat well each day.

? Does anyone help with her other children and household work? Does someone bring food, water, and fuel when she needs it?



Talk with the pregnant woman's family about helping more with household chores. If the family is not helping enough, neighbors, people from her church or mosque, or fellow workers can all be encouraged to help her.

? Where is she planning to have the baby?



If she plans to give birth at home, decide how she will get medical help in case of emergency. See page 18.



If she hopes to have the baby in a hospital or clinic, make a plan about how to get there, including how to pay for transportation and admittance.

Check health signs

Check the mother's health signs at every visit.

- Check her weight and blood pressure.
- If she feels ill or seems unwell, also check her temperature, pulse, and breathing. Learn how to check these health signs in Examining a Sick Person (in development).
- Check the baby's growth and position and listen to the baby's heartbeat (see pages 16 to 18).

Weight

If you have a scale, check the mother's weight at each visit. She should gain weight, a little at a time, through the whole pregnancy. In general, a healthy pregnant woman gains between 12 and 16 kilos (25 to 35 pounds) during pregnancy. Starting at 4 months, it is healthy to gain a little less than $\frac{1}{2}$ kilo (1 pound) each week — more if she starts underweight, less if she starts fat.

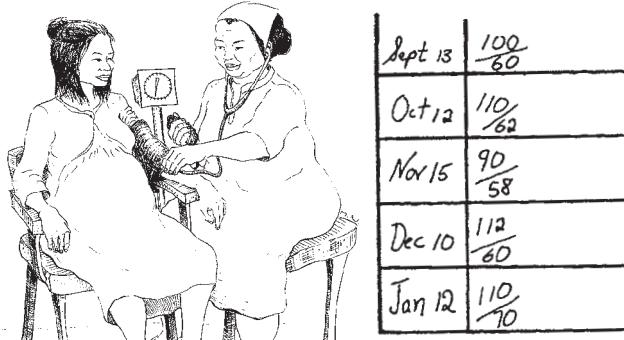
If the woman is not gaining weight, help her to get and eat more food.

Diabetes can cause sudden weight gain (see Chronic Illnesses - in development). Sudden weight gain in the last weeks of pregnancy can also be caused by twins or pre-eclampsia.

Blood pressure

Blood pressure of 140/90 or higher is not healthy. If the blood pressure is steadily rising each time you check it, that is also a danger sign.

High blood pressure early in pregnancy is hypertension. See Chronic Illnesses (in development). Pregnancy and birth are dangerous for a woman with hypertension and she will need medical help.



Write down the blood pressure at each visit. Is it going up?

High blood pressure after about 28 weeks (6 ½ months) of pregnancy may be pre-eclampsia. This is a dangerous problem that can lead to seizures and death. She needs medical help.

Pre-eclampsia

Pre-eclampsia is a dangerous disease of late pregnancy. There is no way to prevent it. The main sign is high blood pressure which gets worse and worse until the mother has seizures (eclampsia). You can save her life by watching for signs of pre-eclampsia throughout pregnancy and getting treatment quickly if she has signs of severe pre-eclampsia.

If her blood pressure becomes too high, or if there are seizures, medication can help. But the only way to cure the problem is for the baby to be born.

SIGNS OF PRE-ECLAMPSIA

- Blood pressure of 140/90 or more after 28 weeks (the last 3 months or so of pregnancy) AND
- Protein in the urine (see Examining a Sick Person - in development).

If you find high blood pressure in late pregnancy, check for protein in the urine. If there is high blood pressure and protein, the mother has pre-eclampsia and needs medical help or she will quickly get worse.

If there is no protein in the urine, continue to watch her carefully and check her blood pressure at least once a week. Get medical help if you see signs of severe pre-eclampsia (page 16).

SIGNS OF SEVERE PRE-ECLAMPSIA OR ECLAMPSIA

- Severe headaches.
- Blood pressure of 160/110 or higher.
- Blurry vision.
- Pain in the pit of the stomach.
- Severe swelling, including swelling of the face.
- Mental confusion.
- Seizures.

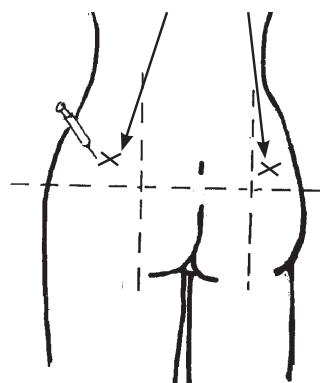


TREATMENT

If at any time the mother has signs of severe pre-eclampsia, get medical help right away. The mother's life is in danger and she must give birth as soon as possible.

- Stay calm.
- If the mother is having a seizure, turn her on her side. This keeps her from choking on her vomit or spit.
- If you have it, give oxygen.
- To stop the seizures, inject 5 grams magnesium sulfate into each buttock. You can repeat this in 4 hours. **Do not give magnesium sulfate if she is breathing less than 12 breaths a minute.** (Magnesium sulfate comes in different concentrations so be sure you have the right amount. Read more on page 34.)

Inject 5 grams in each buttock, here, and here.

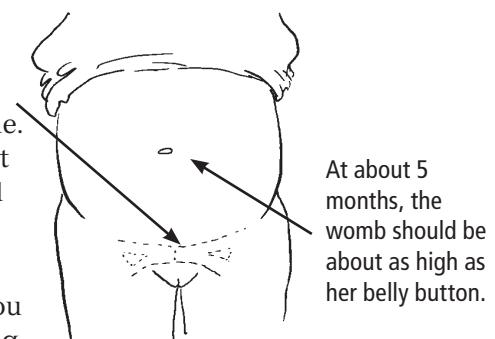


The baby's growth

After 3 months of pregnancy you should be able to feel the top of the womb at the bottom of the mother's belly, just above her pubic bone. At about 5 months the womb should be about as high as her belly button, and then should continue to grow about one finger-width each week.

If the womb grows bigger or faster than you would expect, the woman may be farther along in pregnancy than you thought. Or she may have twins. Or she may have diabetes or another health problem.

If the womb and baby grow very slowly the mother may not be as far along in pregnancy as you thought. Other causes of small growth are not eating enough food, or being exposed to smoke or poisonous chemicals.



At about 5 months, the womb should be about as high as her belly button.

The baby's position

The baby moves around at the beginning of pregnancy. Toward the end, the baby gets into position for the birth.

With practice you can feel whether the baby is head down (a safe position) or is butt down (breech, a position where problems are more likely to occur).

Use two hands and firm, deep pressure. Ask the mother to slowly blow out all her breath and you will be able to press your fingers deeper to feel the baby.

Feel the top of the belly with two hands. Do you feel a hard, movable head? Or a soft butt?

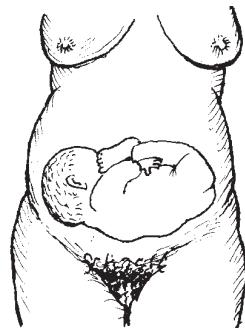


Feel the part in the pelvis. Is it hard or soft? When you hold it, can you move the rest of the body freely?



If the baby is breech at the time of birth, it may be safer to give birth in a hospital. If you are helping a woman have a breech baby, see page 28.

A sideways baby cannot be born through the vagina. If the baby is sideways when labor starts, get to a hospital. Cesarean surgery is needed.

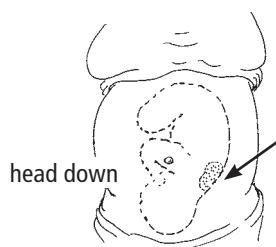


The baby's heartbeat

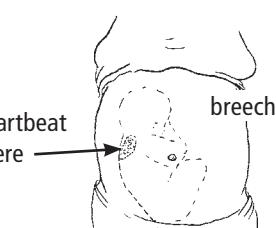
By week 20 (about 4 ½ months) you should be able to hear the baby's heartbeat with a fetoscope and a few weeks later with a regular stethoscope. A healthy baby's heart speeds up and slows down a lot but stays between 120 and 160 beats each minute. This is about twice as fast as an adult. It may be slower when the baby is sleeping. (If you hear a heartbeat between 60 and 80, you are probably hearing the mother's heart, not the baby.) Use a watch with a second hand or a 1 minute timer to count the beats.



A fetoscope is for listening to the baby through the mother's belly.



After about week 20 of pregnancy, a baby's heartbeat can show you the baby's position.



If the heart stays slower than 120, or faster than 160, or always seems to go at the same speed with no changes, then the baby may be having trouble and you should go for help.

Finally, if you notice two separate baby heartbeats, there may be twins.

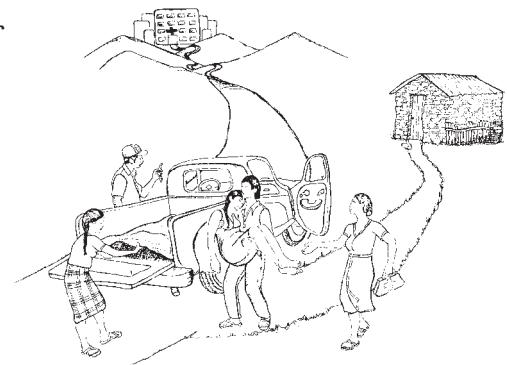
Make a plan for emergencies

Every common emergency of birth is treatable. Bleeding, seizures, infection, labors that go on and on, all can be stopped with the right medicines or sometimes surgery in a well-equipped medical center. The hard part is getting this help when it is needed. Remember that there is rarely much warning before something goes wrong in birth. Money, transportation, and cooperation from family or neighbors are all better arranged in advance, before labor begins.

Bring together the mother and the people who care for her: her husband, mother-in-law, or whoever else, and decide what will be needed in case of an emergency. This might include:

- the use of someone's car or other vehicle.
- money to pay for care.
- permission in advance from those who make family decisions.

If you are very far from medical help, consider spending the weeks before the birth with a relative who lives closer to a hospital.



Labor and Birth

Every community has traditions of how to care for women in labor. The safest traditions allow nature to take its course while staying alert for signs of danger. Remember:

- Most births are safe and healthy.
- Encourage the mother. Hold her hand, talk gently to her, show her how to take slow, deep breaths.
- Help the mother move, walk, change positions, and make sounds.



If there are signs of problems, do not delay – get to a hospital right away.

⚠ Danger Signs in Labor and Birth

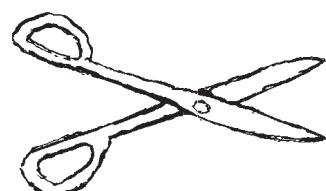
- **Too long labor:** Labor longer than 12 hours for an experienced mother, or longer than 24 hours (a whole day and night) for a first birth, often leads to injuries in the mother and difficulty for the newborn. Also, if the water breaks, but labor has not started after 12 hours, this can lead to infection.
- **High blood pressure:** Blood pressure of 160/110 or higher is an emergency. Get medical help and watch for seizures on the way.
- **Fever:** If there is a fever and the mother has a fast pulse, or the baby's heartbeat is fast, there is probably a womb infection that could harm the mother and baby. Get help and give antibiotics on the way. See page 36.
- **Sideways baby:** This is an impossible birth position and a cesarean birth is needed right away to save the baby. Get medical help.
- **The cord comes out before the baby:** This rare occurrence causes the baby's head to pinch the cord, cutting off the supply of blood to the baby. The baby can only be saved if you can immediately get to a hospital for a cesarean birth. The woman should stay on her hands and knees with her bottom up in the air to keep the pressure off the cord.

Prepare for birth

For a safe birth, prepare these supplies:



Soap and water to wash hands often, clean the mother, and wash medical tools.



New or freshly sterilized razor blades or sharp scissors for cutting the cord.



Medicines to stop bleeding: oxytocin, misoprostol.



Plenty of disposable gloves to protect the health of the mother, baby, and the midwife.



Sterilized or freshly boiled string or ribbon, or cord clamps for tying or clamping the cord.

The family or health worker should also gather:



Lots of clean cloths or towels to keep the new baby warm and dry.



A light for seeing the birth and the baby.



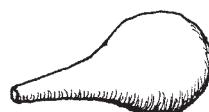
Water for drinking and cleaning up.



A bowl for washing up and a bowl to catch the placenta.

Other useful tools for the health worker or midwife:

- The mother's health records
- A new or sterilized suction bulb or suction trap for sucking mucus out of the baby's mouth and nose
- A fetoscope, stethoscope, and blood pressure cuff
- Sterile needles and suture for sewing any tears



Keeping clean is the most important thing you can do to protect the mother, baby, and yourself. At every birth, wash your hands well and often. Clean anything that will touch the baby or the mother's vagina. If possible, use new, clean gloves for touching the mother's vagina or the baby.

Protect yourself from the blood and fluids of birth which can carry viruses and infections, such as HIV or hepatitis. Wear gloves. Wash regularly during the birth, especially after getting any fluid on yourself. If fluid gets in your mouth or eyes, wash with a lot of water right away. If you get blood in your eyes or into a cut in your skin, see Care for Sick People (in development).

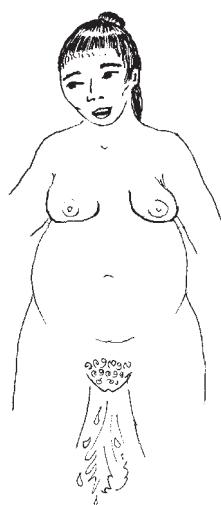
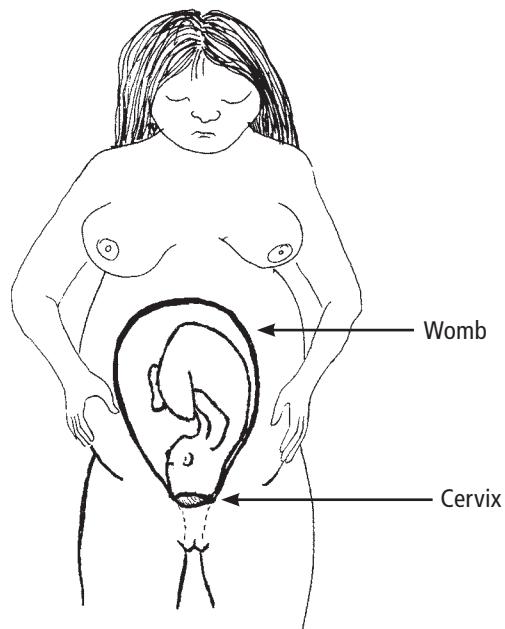


The start of birth

Contractions

Labor pains, or contractions, are the womb tightening and relaxing over and over. These contractions slowly open the bottom of the womb, called the cervix. When the cervix is open all the way, the baby can come out of the womb and then out of the vagina.

Mild, practice contractions start late in pregnancy. They do not last very long and they stop when the mother rests. **True labor contractions** are strong. They come often, and in a regular pattern, once every few minutes. They do not go away when the mother lies down or rests.



Breaking bag of waters

The bag of waters can break with a big splash or with a slow leak of fluid. The loss of fluid may be the first sign of labor before contractions start. Or there may be a splash during labor. Sometimes a baby is born inside the bag and it does not break at all. These are all normal.

Inside the womb, the bag protects the baby from germs. After the bag breaks, germs can infect the womb and the baby. For that reason, the longer the bag is broken, the more likely infection is to occur. Do not put anything in the vagina after the bag of waters has broken. If the bag breaks and 12 hours – 1 day or 1 night – passes without labor starting, go to a hospital where labor can be started with medicine.

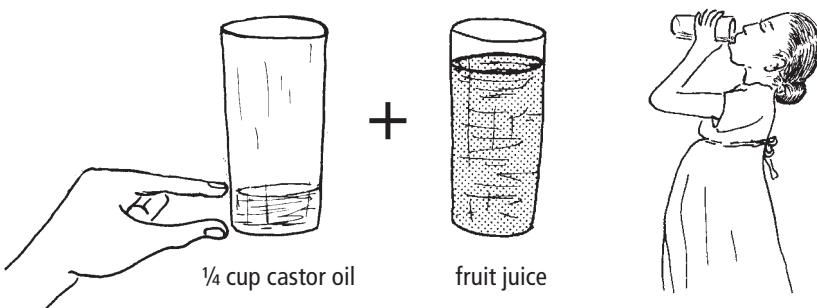
Helping labor start

You might want to help start a labor, or speed a slow labor, in these situations:

- **A too-long pregnancy.** A pregnancy longer than 41 weeks can cause health problems for the baby.
- **A broken bag of waters.** After water breaks, help start labor to avoid the risk of infection.
- **A labor that is moving very slowly.** Help start or strengthen labor so the mother does not become exhausted.

Start with the first method and if it does not work, try the next:

1. Have her walk, dance, or climb stairs or hills.
2. Massage her nipples as if milking the breasts (see page 20 in Newborn Babies and Breastfeeding). Or have a baby nurse. This should bring some contractions.
3. Mix about $\frac{1}{4}$ cup castor oil with some juice and have the mother drink it. This usually causes painful diarrhea and cramps, but it may also start contractions.



There may be plant medicines that are used in your community to start labor. Some of these may be safe, others are not. Before using them, ask yourself: have these plants started labor for other women? Have women or babies ever had health problems after taking these plant medicines? Have these medicines been used for a long time or did people only start using them recently? See Medicines, Tests, and Treatments (in development) for more ideas about how to know if a plant medicine is safe.

- Do not try to start labor if the baby is sideways in the womb.
- Do not waste time trying to start labor if you are far from medical help. Instead, use your time to go to the hospital.
- Never give oxytocin, misoprostol, or other medicines to start labor at home. These medicines are so strong they can kill.

Helping a woman in labor

Mostly you can help a woman give birth by giving loving encouragement. Avoid putting your fingers inside the vagina to check the cervix. This is not necessary in a normal labor and can cause infection. Do not push on the belly or use cloths to pull the baby down. None of this helps get the baby out faster.

For most of labor, watching quietly is better than interfering.

During the opening stage of labor, the health worker should simply encourage the mother. Remind her to:

- breathe slowly, blow, or make sounds to relieve the pain during contractions.
- sip liquids often, and eat small amounts of food.
- urinate every few hours. A full bladder slows birth.

Check the health signs of the mother and baby

If you know how, check the mother's blood pressure, pulse, and temperature, and the baby's position and heart rate, as soon as labor starts. Continue checking regularly during labor. These signs can tell you if the mother is getting an infection or pre-eclampsia, or if the baby is in trouble.

To look for pre-eclampsia:

Check the blood pressure. Blood pressure of 160/110 or above is severe pre-eclampsia and may lead to seizures. Get help.

To look for infection:

Check the mother's temperature. It often rises in labor, but a temperature of 38° C (100.4° F) or higher is usually an infection. While any infection (such as malaria or urinary tract infections) can happen in labor, be especially mindful of infection inside the womb. Other signs of womb infection are:

- The baby's heartbeat is more than 180 beats in a minute.
- The mother's pulse is more than 100 beats in a minute.
- The mother's vagina smells bad.
- The mother's belly is sore or tender to the touch.

Treat womb infection with ampicillin and gentamicin right away and continue to give it after the birth. If signs of infection are severe, also give metronidazole. See page 36 for more on these medicines. And get help.

To check the baby's well-being:

A baby's heartbeat that stays less than 120, or ever goes below 100, is a sign that the baby is not getting enough oxygen and is in danger. The baby might die, but there is nothing to do except deliver the baby.



Walk around or change positions every hour or so.

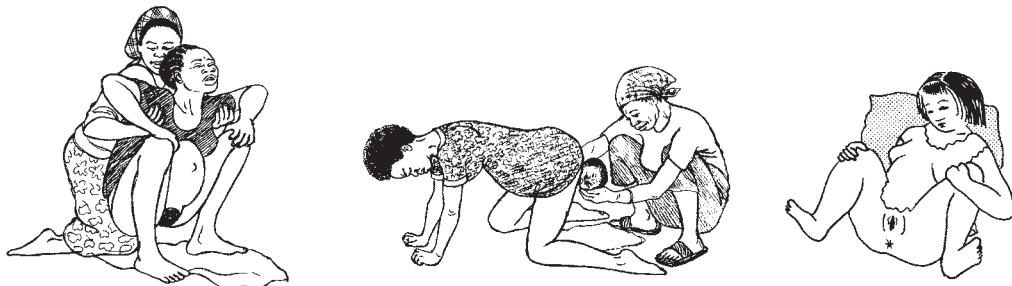


Length of labor

Each woman's labor is different and that is normal. A healthy labor can be very fast or can last many hours. However, some babies get stuck and will not be born without medication or surgery. Think about how long it will take for you to get to a hospital. If you are far away and labor has gone on for hours, start toward help sooner.

Pushing

Once the mother feels a strong urge to push, she can do so safely. Mostly, mothers know how to push their babies out without help. Do not yell at the mother or boss her.



Squatting, hands-and-knees, and propped up on pillows are all good pushing positions. If one position does not bring the baby out, try another.

Pushing usually feels good to the mother compared to the earlier labor pains. If the labor has been long, the mother may doze off between contractions and then wake up to push.

If pushing takes a long time:

- encourage the mother to change positions.
- ask the mother to urinate. A full bladder slows labor.
- ask her to rest between contractions, and then take a deep breath and push as hard as she can during contractions.

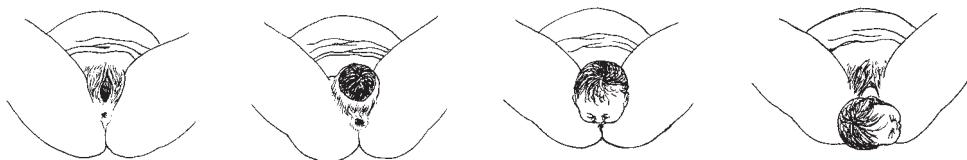
After 2 hours of strong pushing, get medical help. Surgery may be needed to bring out the baby.

If the baby is breech: You may be able to feel the baby is breech (butt or legs first) by feeling the mother's belly. If you see a lot of fresh, dark meconium (baby feces) coming from the vagina during labor, the baby is likely breech. See page 28 for how to deliver breech babies.

The birth

When you can see the baby's head coming, **wash your hands** well and put on gloves. If the baby is butt down (breech), see pages 28 to 29.

When the head comes out, it will look like this:

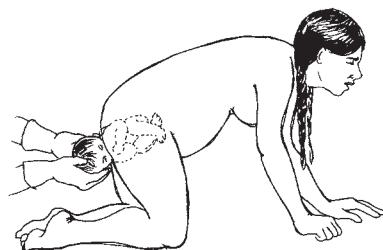


Never twist or pull on the baby's head.

Hold the head gently. Guide it towards the mother's bottom and away from her belly. Let the rest of the baby's body come out into your hands.

If the cord is around the neck, you can usually loosen it enough to slip it over the baby's head or to allow the baby's body to slide through it. In the very rare times when it is tightly looped around the neck and the baby cannot move past it, you may need to clamp and cut it. Then have the mother push the baby out as fast as possible.

If the shoulders get stuck after the head comes out, move the mother quickly to her hands and knees. Ask her to hold her breath and push hard.



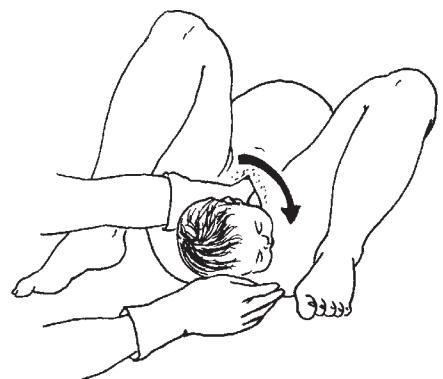
If the baby is still stuck, move the mother onto her back. Ask her to pull her knees back as far as possible toward her armpits. Have a helper push firmly, just above the pubic bone, like this.

Move the baby's head
down toward the floor
to free the shoulder from
under the bone.



You may need to reach into the vagina and turn the baby by pushing on the back of its shoulder. Or sweep the baby's arm down across its body and out of the vagina. The body should follow easily.

After the birth, put the baby directly onto the mother's naked chest – skin against skin. This is the safest, warmest place. Gently wipe mucus off the baby's mouth then nose. Dry the baby well with clean cloths or towels. Then cover the baby and mother with cloths or a blanket. For more on caring for the new baby, see Newborn Babies and Breastfeeding.



Things to check after the birth

- Is the baby breathing? If the baby does not breathe, struggles to breathe, or turns blue, see pages 1 to 3 in Newborn Babies and Breastfeeding.
- Is the mother bleeding heavily? If she bleeds after the birth, see pages 29 to 31.

The cord

There is no rush to cut the cord. After a few minutes, feel it between two fingers. If you can no longer feel a pulse, it is OK to tie or clamp it.

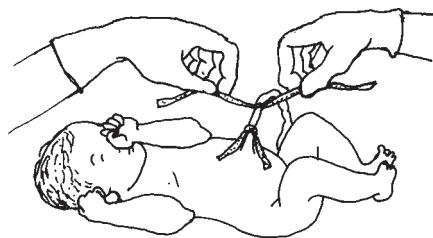
Wash hands well.

Use a sterile clamp or freshly boiled or ironed string.

Tie the cord about 2 fingers away from the baby's body. Then tie again about 2 more fingers away.



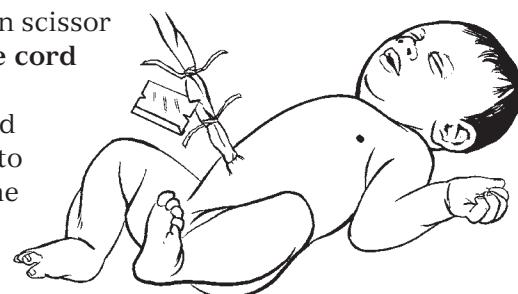
Tie a square knot.



Cut the cord between the 2 ties.

Use a brand new razor blade, or a clean scissor or blade. **Whatever you use to cut the cord must first be washed and sterilized.**

Boiled is best. If you cannot boil it, hold it over a flame or clean it with alcohol to kill most germs. After cutting, leave the baby's cord stump alone to prevent infection. (Page 17 in Newborn Babies and Breastfeeding explains how to care for the cord stump.)



The placenta

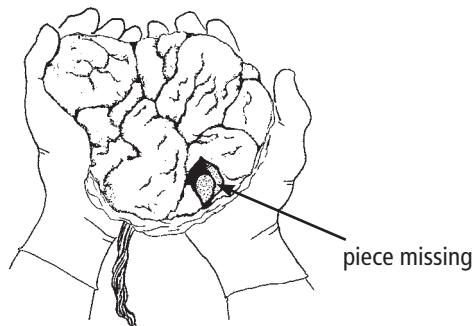
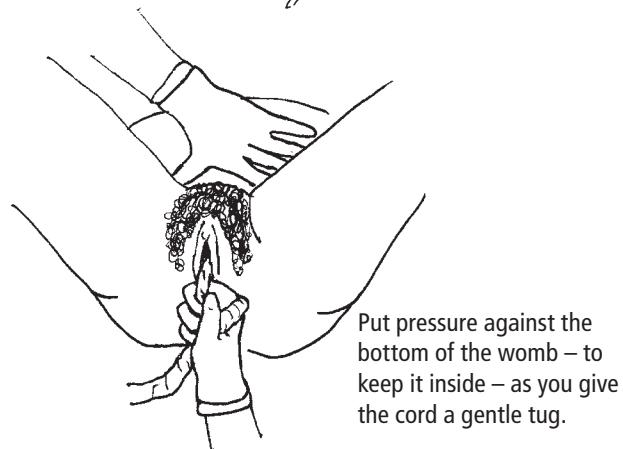
If there is not much bleeding, then there is no rush for the placenta to be born. Wait until the mother feels the urge to push it out. If she is bleeding, ask her to push hard during a contraction. If the placenta does not come out:

- help the mother breastfeed. Breastfeeding right after birth causes contractions that push the placenta out.
- ask the mother to urinate. A full bladder can stop the womb from tightening and pushing out the placenta.
- ask the mother to squat and then push again.

If the mother is losing blood quickly, or if the steps above do not work, try **gently pulling the cord**. If you feel resistance, stop. (Pulling too hard can break the cord or pull out the womb.)

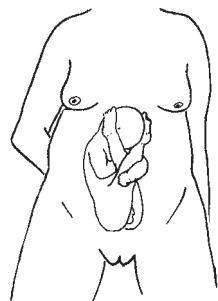
Once the placenta has come out, check it. Are any pieces missing? If so, rub the lower belly firmly to get them out. Give oxytocin or misoprostol (see pages 33 and 34). If the missing piece does not come out, get medical help. A piece of placenta left in the womb can cause serious infection and bleeding.

When the mother and baby are safe, take a moment to clean up, wash the mother's genitals and legs, and offer her food and drink. Help the mother and baby start breastfeeding (see page 18 in Newborn Babies and Breastfeeding) and offer your blessings and congratulations to the family as they welcome the new baby into the world!

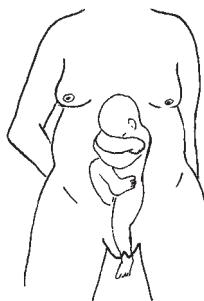


Breech

A breech birth can have serious problems, including the cord coming before the baby or the baby's head getting stuck inside. Both of these are so dangerous they can cause death. If possible, a breech baby should be born at a well-equipped medical center, especially for a mother's first baby.

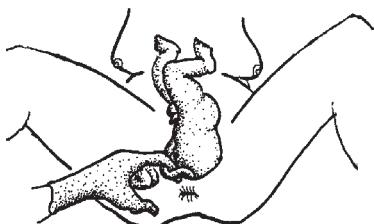


A frank breech (butt first) is the safest of the breech positions.

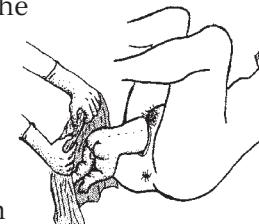


A footling is the most dangerous.

1. The mother must not push until her cervix is all the way open. Ask her to blow or change positions until she cannot resist the need to push. Then let the body come out on its own. Do not pull on it.
2. When the baby's belly is out, if the cord is very tight, gently pull a little bit loose – so the baby is not held back by it. Otherwise, do not touch the cord.



3. When the butt and legs come out, wrap the baby in a clean blanket. If she gets cold, she may try to take a breath and her lungs will fill with fluid.

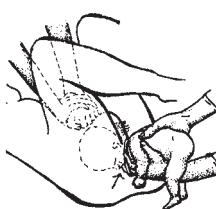


4. If the baby is stuck halfway out, reach inside the vagina to unfold an arm down across her chest.
5. If the baby gets stuck at the head, put the mother on her back. Ask someone to push on the very bottom of her belly, just above the pubic bone. **Do not push on the top of the belly.**

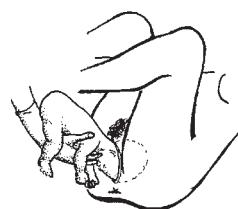


6. The baby should now turn to face the mother's bottom.

Support the baby's body with one arm. Put your finger inside the baby's mouth or on the baby's upper lip, and pull it down towards the baby's chest. This keeps the chin tucked. Put your other hand on the baby's shoulders, with your fingers against the hard part at the back of the baby's head to keep the head tilted so it can come out.



7. The weight of the baby's body will move it down, towards the mother's bottom. Go slowly. **Do not pull.**



8. When you see the baby's hair, lift the baby's body up. Keep your finger in its mouth. The face should come out.

9. Now ask the mother to stop pushing and blow. **Let the top of the baby's head come out as slowly as possible.**

Be ready to help the baby breathe (see pages 1 to 3 of Newborn Babies and Breastfeeding).

A breech baby is likely to be bruised and swollen on the bottom and legs. This will usually get better in a few days.

After the Birth

After the birth, help the mother deliver the placenta and watch for bleeding. See Newborn Babies and Breastfeeding for how to care for the baby and help start breastfeeding.

Bleeding

Watch the mother's bleeding closely and continue to check it often. Lift off any covers and also check if blood is pooling under her bottom. There is often a small gush of blood when the placenta is born. This is OK. But any big gush or smaller but ongoing flow of blood is an emergency.

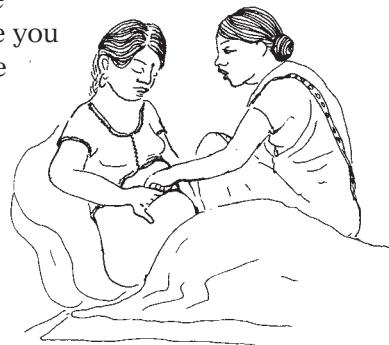
For too much bleeding:

- Birth the placenta
- Help her urinate
- Rub the womb
- Give medicines to stop bleeding

Rub the womb

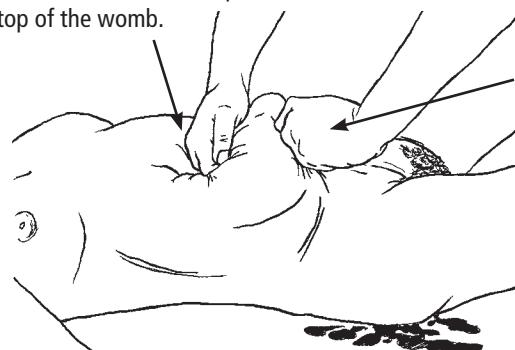
Rub the woman's womb after the birth of the placenta every 15 minutes or so, and anytime you notice bleeding. Rub hard and deep, until the womb feels like a hard, round ball in the center of the belly, below the belly button. If the womb is off to one side, the bladder is full and the woman should urinate.

If the bleeding continues, rub harder, squeezing the womb between two hands. It will hurt, but should work.



Rub the womb until it is hard. Then cup 1 hand on the top of the womb.

Put your other hand, in a fist, at the bottom of the womb.



If the bleeding still does not stop, you can put one hand inside the vagina, make a fist, and then use the other hand to press the womb into your fist.

Medicines to stop severe bleeding

Most bleeding can be stopped with oxytocin or misoprostol.

- Inject 10 units oxytocin in the muscle on the side of the woman's thigh. (For how to give injections, see Medicines, Tests, and Treatment – in development.)

OR

- Give 800 mcg misoprostol dissolved under the tongue for 30 minutes.

Heavy bleeding can also be prevented by using these medicines. For this reason, some health workers give either 600 mcg of misoprostol one time only or one shot of oxytocin immediately after every birth, especially if they can easily get medicines. If you are worried about heavy bleeding and can give one of these medicines, do so.

SIGNS OF SEVERE BLOOD LOSS

Get medical help for any of these signs and, on the way, treat for shock (see pages 10 to 11 of First Aid).

- Lightheadedness
- Weakness
- Passing out
- Confusion
- Cold, clammy skin
- Fast or rising pulse
- Low or dropping blood pressure

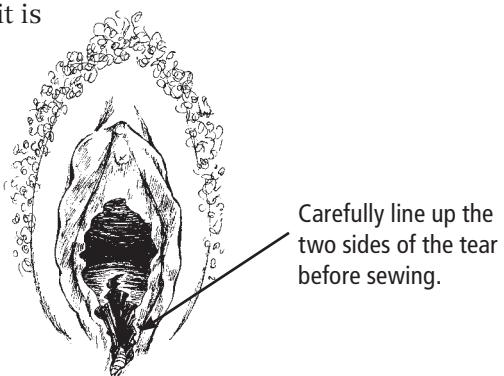


Check for tears

Small tears heal on their own. Long or deep tears will heal better with a few stitches. A stitch will also stop the bleeding if a blood vessel in the vagina has torn.

Gently put a clean, gloved finger into the cut to see how deep it is. If you know how to sew, use only a few stitches. For a deep tear, use a couple of dissolvable stitches in the muscle before you sew the skin together. Do not leave a pocket to collect pus. For more on sewing, see page 15 of First Aid, but if you are not experienced at sewing, it is almost always best to let a tear heal on its own.

If the tear is all the way into the rectum, the round sphincter muscle must be sewn together before the tear is sewn. Someone experienced in this kind of suturing must sew this or the woman may never be able to hold in her feces.



In the Weeks After Birth

In the weeks after birth, make sure the mother is healthy, resting, eating well, and that someone is helping her when she needs it. Also see Newborn Babies and Breastfeeding.

Bleeding

Bleeding normally continues for a few weeks. At first it is about the same amount as a heavy menstrual period and then it lessens, becomes more watery, and stops after 2 or 3 weeks. Filling a thick pad or rag with blood in 1 hour (or faster) is too much.

If bleeding increases in the days after birth, the mother may just need help with her chores and care for her other children so she can rest more. But sometimes bleeding is caused by something left inside the womb, and sometimes it is caused by infection.

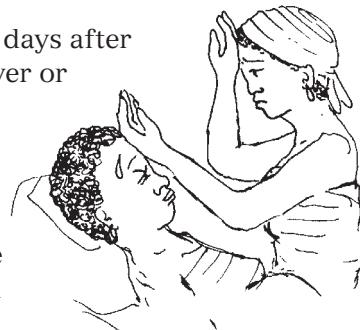
To help stop bleeding, first help the mother breastfeed. This makes the womb contract. Also remind her to urinate often. Show the mother how to massage her womb to make it firm. If none of that works, give oxytocin or misoprostol (pages 33 and 34) and look for signs of infection.



Infection

A woman's temperature often goes up about 3 days after the birth when her milk comes in. A lasting fever or fever of 38° C or higher is a sign of infection.

It is normal for vaginal discharge to have a strong smell for several days after birth. But a foul or fishy smell after birth is a sign of infection inside the womb. Other signs include chills, fast pulse, or pain or tenderness around the womb.



Treat any sign of womb infection with ampicillin, gentamicin, and metronidazole, see page 36. If possible, use injectable antibiotics at least for the first 2 days. If you do not have antibiotics, or if the woman does not start to get better in 24 hours, get help.

Pregnancy and Birth: Medicines

Medicines for Severe Bleeding after Birth

Oxytocin

Oxytocin prevents or controls heavy bleeding after birth. It can also be used to hasten the delivery of a placenta that is not coming out. Used for these purposes, this drug is safe and works very well.

In a hospital, oxytocin is sometimes used to speed up labor, but should never be used at home for this purpose because without careful medical monitoring it can make the uterus contract so hard it can rip open.

How to use

To treat or prevent heavy bleeding after birth

- Inject 10 units into the side of the thigh muscle.

Misoprostol

Misoprostol prevents or controls heavy bleeding after childbirth.

In a hospital, misoprostol is sometimes used in very small doses to speed up labor, but it should not be used at home for this purpose because without careful medical monitoring it can make the uterus contract so hard it can rip open.

It is sometimes used to end a pregnancy in the first few months, or to control bleeding from an abortion or miscarriage.

Side effects

Nausea, stomach ache, or diarrhea.

Important

Check the woman's temperature after giving this medicine as it sometimes causes high fever. If this happens, stop giving the misoprostol and treat the fever right away with paracetamol.

Misoprostol should usually be avoided in women who have previously had cesarean births.

How to use

Dissolve tablets of misoprostol under the tongue or against the inside of the cheek for 30 minutes. They also work well dissolved in the vagina or in the rectum. This is especially useful if the woman is nauseous.

To prevent severe bleeding after birth

- Give 600 mcg, by mouth, immediately after the baby is born.

To treat severe bleeding after birth

- Dissolve 800 mcg under the tongue for 30 minutes or insert tablets in the rectum.

Medicines for Severe Pre-eclampsia and Seizures

Magnesium sulfate

Magnesium sulfate is the best medicine to treat seizures (convulsions) in pregnant women with eclampsia. If you cannot get magnesium sulfate, give diazepam instead (see page 35).

Important

Only use magnesium sulfate if a woman's blood pressure is over 160/110 (pre-eclampsia), or if she has a seizure (pages 15 to 16).

Count the breaths before and after giving. Do not give if her breathing is less than 12 breaths per minute. Do not give a second dose if her breathing slows to less than 12 breaths per minute, or if the woman cannot urinate within 4 hours after the first dose.

Magnesium sulfate comes in different concentrations (the number of mg in each ml of liquid), so check the label carefully, and be sure to mix in the correct amount of sterile water before using.

How to use

- Inject 10 grams of 50% solution in the buttocks. Because such a large injection can be painful, split the injection so 5 grams go into each buttock muscle.

If after 4 hours you have not yet reached medical help, you can give one more injection of 5 grams into one buttock only.

Diazepam

Diazepam can be used to relax muscles and calm pain. It can also be used to stop a single seizure. For people with ongoing seizures (epilepsy), use a different medicine, one that can be taken every day.

Side effects



Sleepiness.

Important

- Too much diazepam can slow down or stop breathing. **Do not give more than the recommended dose and do not give more than 2 doses.**
- Diazepam is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not give during pregnancy unless the woman has a seizure (for example, due to eclampsia).
- Do not inject diazepam unless you have experience or training to do so. It is very difficult to give safely by injection. Instead, during a seizure, you can put it into the rectum.

How to use

Use the liquid solution for injection or grind up the tablets and mix with a little water. Take the needle off a syringe, then draw up the medication. Or use diazepam gel made for use in the rectum.

Lay the woman on her side and use the needle-less syringe to put the medicine deep into her rectum. Then hold her buttocks together for 10 minutes to keep the medicine in.

For a seizure

- ➔ Give 20 mg diazepam in the rectum.

If seizure continues 10 minutes after the first dose, you can give another 10 mg, but do not give more than that amount.

Medicines for Womb Infection

For mild fever during labor, ampicillin (below) plus gentamicin (page 37) will usually work. For high fever in labor, or for signs of infection after birth, use metronidazole as well to fight all the possible bacteria that can cause the infection. It is best to inject at least the first dose of ampicillin, but if you have only pills give those instead.

AMPICILLIN Inject 2 grams. Wait 6 hours, then inject or give by mouth 1 gram every 6 hours.

AND

GENTAMICIN Inject 5 mg per kg, once a day. If you cannot weigh the woman, inject 80 mg, 3 times a day.

AND

METRONIDAZOLE Give 500 mg by mouth, 3 times a day.

Give all 3 medicines until 2 days after signs of infection have stopped.

In case of allergy to penicillins, give 500 mg erythromycin 4 times a day instead of ampicillin. Other combinations of antibiotics can be given if they are all you have. Choose a combination that fights a wide range of bacteria.

Ampicillin

Ampicillin is a broad-spectrum penicillin, which means it kills many kinds of bacteria. You can often use it interchangeably with amoxicillin, that is, if this book or another resource suggests one of these medicines, you will often be able to use the other in its place, in the correct dose.

Ampicillin is very safe and especially helpful for infections during birth.

Side effects

Ampicillin tends to cause nausea and diarrhea.

The other common side effect is rash. But, raised, itchy bumps that come and go in a few hours are probably a sign of penicillin allergy. Stop giving the medicine right away and do not give the person a penicillin medicine again. Future allergic reactions may be more severe and even life-threatening. For some problems, erythromycin can be used instead, see page 45 in Belly Pain, Diarrhea, and Worms. A flat rash that looks like measles, usually starts a week after starting the medicine, and takes days to go away, is not necessarily an allergy. But it is impossible to know for sure if the rash is from allergy or not, so it is usually better to stop the medicine.

Important

Resistance to this medicine is growing more common. Depending on where you live, it may not work any more against staphylococcus, shigella, or other infections.

How to use

Ampicillin works well when taken by mouth. It can also be given by injection, but should be injected only for severe illnesses such as pelvic infection or womb infection, or when the person is vomiting or cannot swallow.

As with other antibiotics, always give the medicine for at least the shorter number of days shown here. If the person still has signs of infection, have her continue taking the same amount every day until all signs of infection have been gone for at least 24 hours. If the person has taken the medicine for the maximum number of days and is still sick, stop giving the antibiotic and get medical help.

Likewise, the amount of antibiotic to take depends on the age or weight of the person and the severity of the infection. In general, give the smaller amount for a thinner person or a less severe infection, and the larger amount for a heavier person or a more severe infection.

For womb infection

Give combined with other antibiotics and in the amount listed on page 36.

Gentamicin

Gentamicin is a very strong antibiotic of the aminoglycoside family. It can only be given by injection or IV (in the vein). This drug can damage the kidneys and the hearing, so it should only be used in emergencies.

Important

Gentamicin must be given in the exactly correct dose. Giving too much can cause kidney damage or permanent deafness. It is best to dose by weight. And do not give gentamicin for more than 10 days.

How to use

For womb infection

Give combined with the other antibiotics and in the amount listed on page 36.

Metronidazole

Metronidazole is effective at fighting certain bacteria and infections, used by itself or in combination with other antibiotics.

Side effects

Nausea, cramps, and diarrhea are common. Taking with food may help. Sometimes it causes a metallic taste in the mouth or a headache.

Important

Do not give metronidazole in the first 3 months of pregnancy because it may cause birth defects. Also avoid giving metronidazole later in pregnancy and while breastfeeding unless it is the only effective medicine and is definitely needed. Do not drink alcohol while taking metronidazole or until 2 days after you finish taking it. Drinking alcohol while taking it causes severe nausea. Do not use metronidazole if you have liver problems.

How to use

For many conditions, you can give a high dose of this medicine for 3 days, or a lower dose for 5 to 10 days. Pregnant women should avoid the high dose treatments.

For womb infection

Give combined with the other antibiotics and in the amount listed on page 36.

Vitamin and Mineral Supplements Iron, ferrous sulfate, ferrous gluconate

Ferrous sulfate is useful in the treatment or prevention of most cases of anemia. Treatment with ferrous sulfate by mouth usually takes at least 3 months.

Iron works better when taken with vitamin C (either by eating fruits and vegetables, or taking a vitamin C tablet).

Side effects

Iron sometimes upsets the stomach and is best taken with meals. Also, it can cause constipation especially in older people, and it may make the stools (feces) look black. See advice for constipation on page 37 of Belly Pain, Diarrhea, and Worms.

Drinking liquid iron supplements blackens the teeth. Drink it through a straw or brush the teeth after.

Important

Be sure the dose is right. Too much ferrous sulfate is poisonous. Do not give iron to severely malnourished persons. Wait until they have recovered their health.

How to use

Different forms of iron contain different concentrations of this mineral. For example, a 300 mg tablet of ferrous sulfate contains about 60 mg of iron. But a 325 mg tablet of ferrous gluconate contains 36 mg of iron. So read the label of your tablets, syrup, or other iron supplement to learn the iron content.

To PREVENT anemia in pregnant and breastfeeding women

→ Give 300 mg ferrous sulfate (60 mg iron) each day. Iron should also be taken daily by women who plan to become pregnant. A combined iron and folic acid supplement is even better, because folic acid helps prevent birth defects.

To TREAT someone who is already anemic

→ Give this amount once a day, or divide into 2 doses if it upsets the stomach.

DOSE BY AGE FOR FERROUS SULFATE

AGE GROUP	HOW MUCH PER DOSE	HOW MANY 300 MG TABLETS	HOW MUCH TOTAL IRON
Under 2 years	→ 125 mg ferrous sulfate	→ Use iron syrup, or crush about ¼ of a 300 mg ferrous sulfate tablet in breast milk	→ Give enough to provide 25 mg iron
2 to 12 years old	→ 300 mg ferrous sulfate	→ 1 tablet of 300 mg ferrous sulfate	→ Give enough to provide 60 mg iron
Over 12 years	→ 600 mg ferrous sulfate	→ 2 tablets of 300 mg ferrous sulfate	→ Give enough to provide 120 mg iron

Folic acid, folate

Folic acid is an important vitamin that aids a baby's healthy development in the first weeks of pregnancy.

How to use

A combined folic acid and iron supplement may be more convenient than taking the two separately. Whether combined with iron or used alone, the dose is the same.

It is best to start taking folic acid before you become pregnant so your body has enough to meet the baby's needs in the early weeks. Continue taking it throughout the first 3 months of pregnancy.

- Give 400 to 500 mcg each day.

Newborn Babies and Breastfeeding

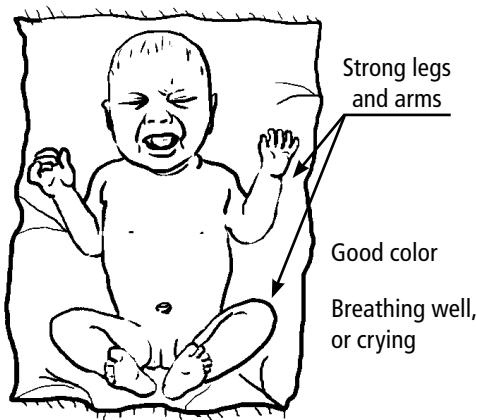
Care Just After Birth

In the first hour after birth, you can help the survival and long-term health of a baby:

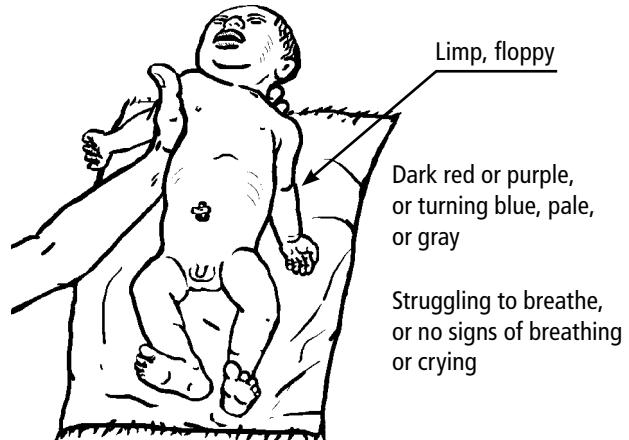
1. Make sure she is breathing well.
2. Keep her warm and dry, skin-to-skin with her mother.
3. Help her start breastfeeding.

Is the baby breathing well?

As the baby is being born, and as you are drying her and putting her to her mother's breast, check to see if she is breathing well. When you act quickly, you can usually save a baby who is not breathing.



This baby looks healthy.



This baby needs help fast.

If the baby is limp, blue, or not breathing

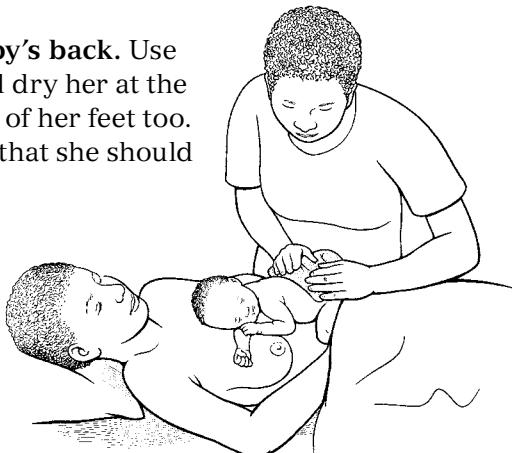
Do not hit the baby.

- 1. Clear mucus from the baby's mouth** by gently wiping it with your finger wrapped in a clean piece of cloth. Or use a bulb syringe or suction trap to get the mucus out of the mouth, then the nose.



- 2. Rub firmly up and down the baby's back.** Use a towel or clean cloth to warm and dry her at the same time. Rub across the bottom of her feet too. This should stimulate her enough that she should take a good, strong breath.

If the baby still does not breathe, or stops breathing, you must give rescue breathing.



Rescue breathing

- 1. Lay the baby on a firm surface:** a table or the floor. Keep a cloth under her and partially cover her so she stays warm.
- 2. Lift the baby's chin just a little,** so her chin is tilted slightly up, toward the ceiling. It can help to put a small rolled-up cloth under her shoulders. This keeps her throat open for breathing.

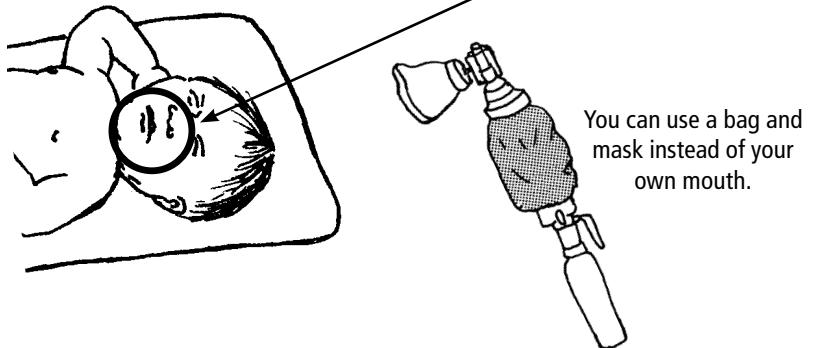


The baby should face straight up, like this.



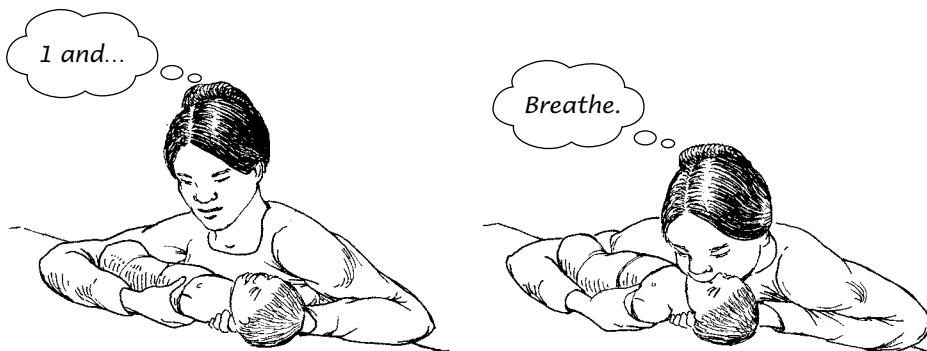
Not like this.

3. Open your mouth wide. Seal your lips over the baby's mouth and nose.



4. Puff air into the baby. Use only small breaths. Give one small, quick puff of air every 1 or 2 seconds. Be careful not to blow too hard, or you can damage the baby's tiny lungs.

After each puff, wait a moment for the baby to breathe out.



If air does not seem to go in, stop. Lift the baby's chin to be sure it is facing straight up and the throat is open. Then try again.

If the baby starts to cry, or breathes at least 30 breaths each minute on her own, she is OK for now. Put her on her mother's chest, and keep her warm. She will probably be fine. But watch closely for the next few hours. Is the baby a good color? Is she breathing easily? If the baby becomes blue around the body or mouth, or struggles to breathe, get help.

If after 20 minutes of rescue breathing, the baby does not begin to breathe on her own, she will probably die. Stay close to the family in this time of grief. They will need your attention and care.

Keep the baby warm – on the mother's skin



The best place for a new baby is on her mother.

A new baby must be kept **warm** and **dry**. The mother's own body heat will warm the baby. Do not take the baby away from the mother to examine or bathe it. The baby does not need a bath right away – and a bath can make the baby dangerously cold. There is no reason to separate the mother and baby – unless you must give rescue breathing.

- **Dry the baby** as you are putting her on her mother's skin.
- **Warm the baby** by putting her, naked, against her mother's bare chest. Then cover the two of them with a blanket or cloth. Quickly replace wet blankets with dry ones because wet cloth will chill the baby.

If the mother must be sent to the hospital, or for some reason cannot hold her baby right away, the father or another family member can hold the baby skin-to-skin.

Start breastfeeding

Babies tend to fall asleep within about an hour of birth. The baby should breastfeed before falling asleep. So if she does not nurse right away, try squeezing a few drops of the mother's first milk onto her lips to get her interested. Or tickle the baby's cheek with the mother's nipple. Nothing ensures a baby's health like breastfeeding. For more on breastfeeding and the importance of giving the first milk, called colostrum, see page 18.



Early babies and small babies

A baby born early or small needs more attention.

- Early means born before 8 ½ months of pregnancy.
- Small means less than 2.5 kilos (5 ½ pounds).

Or just look at the baby: does it seem very small or thin?

These babies may need more help to start breastfeeding and to keep warm. They can more easily get infections and other health problems.

Keep the baby skin-to-skin, and wearing a hat to stay warm. Wake the baby to breastfeed once every 2 hours until she is strong and getting fat. If she has trouble breastfeeding, give her a little breast milk in a small cup or spoon. To learn how to remove milk by hand – for cup feeding – see page 20.



Keep small babies
skin-to-skin for the
first few weeks.

In the Next Few Hours

About an hour or two after the birth, when the baby has breastfed and you have made sure the mother is not bleeding and is OK, carefully examine the baby from head to toe to see if there are any problems that need attention. Do not let the baby get cold while you examine her.

Medicines for newborns

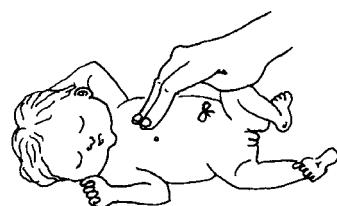
If the mother has gonorrhea or chlamydia (two infections of the genitals), this can infect the baby's eyes during birth, causing severe eye problems and blindness. It is quite common for a woman to have a genital infection and not know it. The best way to ensure gonorrhea or chlamydia are not spread to the baby's eyes is for both women and men to be tested and treated for these sexually transmitted infections. To learn about the signs of these infections and their treatments, see Genital Problems and Infections (in development). To prevent eye infection from gonorrhea, put a little erythromycin or tetracycline ointment in each of the baby's eyes within an hour or two after birth. See page 27.

In places where hepatitis B (see page 17 in Belly Pain, Diarrhea, and Worms) or liver cancer are common, it is wise to give a hepatitis B vaccination to the baby on the first day after the birth. This will prevent the spread of hepatitis B from the mother to the baby. It is also quite common for a woman to have hepatitis B and not know it.

If the mother has HIV, the baby will need HIV medicines (see page 22). Also see HIV and AIDS (in development).

Examine the baby

- Does this baby look like other babies?
- Are her body parts on the left and right sides the same size, shape, and position?
- Is her skin intact? Check especially at the lower back. Sometimes there is a little opening there that needs surgery right away.
- Are her genitals normal? (Swelling on the first day is common and not dangerous.)
- Has she urinated? A baby might not urinate in the first day. But she should pass urine several times on the second day and every few hours after that. If she does not urinate enough, or if her urine is dark colored and strong smelling, she needs to nurse more. Or rarely, she may have a problem with her kidneys.



- Has the baby passed stool? If not, wear a glove and gently insert your smallest finger in the anus to make sure it is not closed shut. If there is no hole she needs surgery.

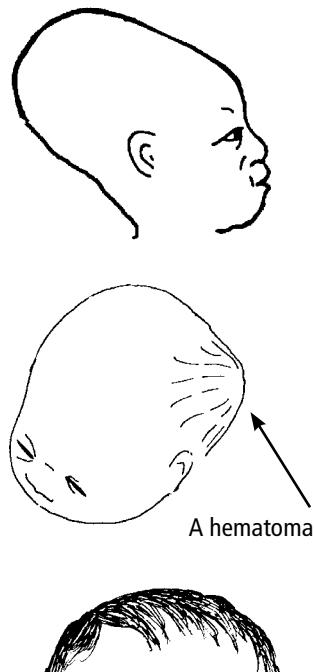
Some differences are not important, and some can be a sign of a serious problem. If a baby has one difference, be aware that there might be others and sometimes they are inside the body. Watch these babies closely for normal breathing, color, and urinating.

Head shape and size

Different head shapes and sizes are normal. A baby's head can be pointy or have a big swelling, especially after a long labor. In a few days the swelling will go away.

Some babies have bleeding under the scalp, called a hematoma. It feels soft when you press it. These are not dangerous. They may take a month or longer to go away.

Some babies who are born early have smaller heads that will develop normally as the baby grows. But if you are worried that a baby's head is too small, especially if you live where there is Zika, talk to a health worker to see if it is the right size or what special help the baby might need. To learn more about preventing Zika, see Illness from Mosquitoes (in development).



Cleft lip and cleft palate

A division in the lip (cleft lip, harelip) is easy to see. A division in the roof of the mouth (cleft palate) is not always obvious. Put a clean finger in the baby's mouth to feel if the top is closed. The danger to a baby of cleft lip and palate is that they can make breastfeeding more difficult.



To breastfeed, try covering the cleft in the lip with a finger, so the mouth can seal around the breast. For a cleft palate, put the nipple and the dark area around it (the areola) deep in the baby's mouth and to one side of the cleft. If the baby still has trouble, give breast milk with a clean spoon or dropper until he grows more able to nurse. Feed him often so he will stay well. To learn how to remove milk by hand for spoon feeding, see page 20.

A cleft lip can be repaired with surgery after 3 months. A cleft palate can be repaired with surgery after 1 year. In many countries these surgeries are provided for free and can make a big difference in the child's life. Ask at a clinic or hospital for information.

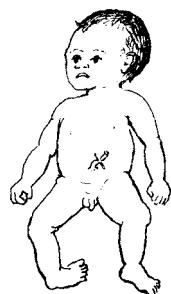
Dislocated hip, hip out of joint, dysplasia



Some children are born with a dislocated hip – the leg has slipped out of its joint in the hip bone. Most often, this fixes itself in a few days or weeks.

Bend the legs so you can hold both the thigh and lower leg together. Rest your fingertips on the baby's hips. Then roll one leg at a time in a slow circle – out, around, down, and back up. If one leg stops early, jerks, or "clunks" when you open it wide, it may be dislocated.

Ask the mother to carry her baby with the legs open, like this. Check the baby again in two weeks. If you still feel or hear a jerk or "clunk," seek help. A simple harness that holds the baby's legs open for a few weeks can prevent life-long disability.



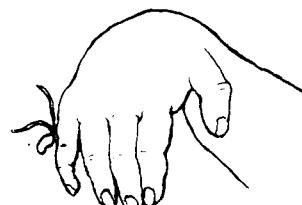
Club foot

If a newborn's foot turns inward or is the wrong shape (clubbed), try to bend it into the right position. If you can do this easily, repeat this several times each day. The foot (or feet) should slowly grow to normal. If you cannot easily bend the baby's foot to normal, take him to a health center within a few days of birth. His foot will need to be straightened with casts. If done early, casting prevents surgery or disability later.



Extra fingers or toes

A small extra finger or toe, with no bone inside, can be removed by tightly tying a string around it. It will dry and fall off. If the finger or toe is larger or has a bone, it will not cause harm, and you can safely leave it be.



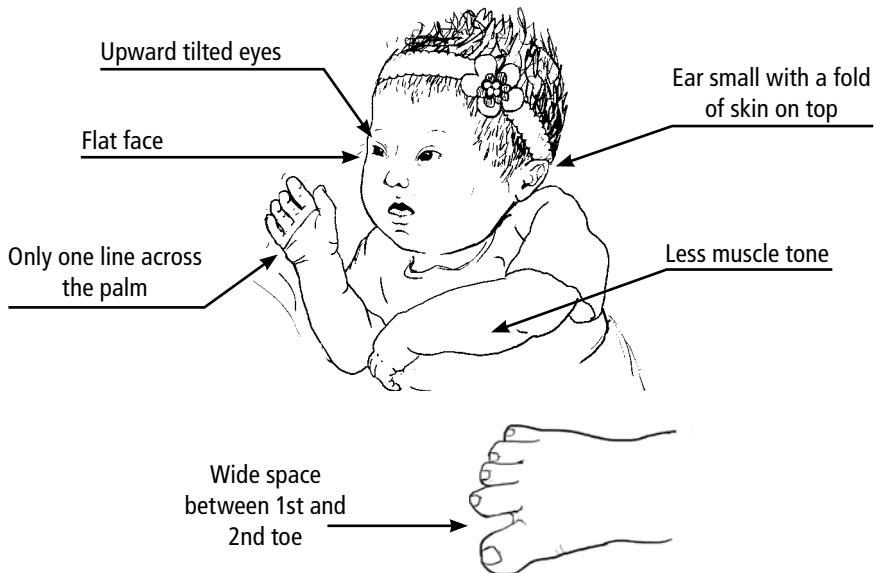
Slight webbing between toes like this is not a problem.



If two or more fingers are stuck together, they will need surgery to work properly.

Down syndrome

A disability that affects thinking or learning may be obvious soon after birth, or you may not notice until the child is older. Down syndrome is a common cause of mental slowness. Babies with Down syndrome have some or all of these signs:

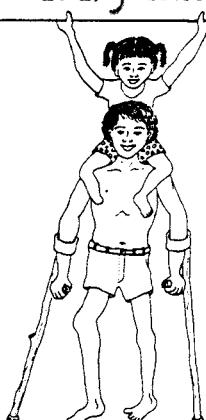


Down syndrome is not caused by anything the mother or anyone else did. If a woman is over 35 years old when she becomes pregnant, her baby is more likely to have it. These babies need the same love and attention as all babies, and certain simple activities can help them learn. For more information, see Hesperian's book *Disabled Village Children*, chapter 32.

Caring for children with disabilities

Many physical differences that cause problems for a child can be treated at home by the family with the help of a health worker. Perhaps more important than any medical treatment though, disabled children need love, attention, play time, learning time, and responsibility, like any other child. Look for the gifts and skills each child brings.

Look for the strengths in every child.



Prevent deformities and disabilities

We usually never know for sure what causes a deformity or disability. And even if we do know, it may not make a difference for that child or his family. Although we do not usually know the cause of a disability in any particular child, we do know that certain hazards make birth defects more likely or more common. So although we may not be able to protect one particular child from a deformity or disability, we can reduce the number of birth defects in any community:

- Help women get enough nutritious food to eat, including protein and vegetables, and seafood or iodized salt.
- Fight for safe workplaces for men and women – so no one is exposed to dangerous chemicals, pesticides, or harsh cleaners that may cause birth defects.
- Protect the air and water from chemicals and poisons – so we are not exposed to them.
- Organize and participate in vaccination campaigns for adults and children, so pregnant women will be protected from rubella and other illnesses that can cause deformities in babies.
- Protect pregnant women from Zika and other illness spread by mosquitoes. See Illness from Mosquitoes (in development).
- Do not drink alcohol or smoke if you are pregnant and avoid unnecessary medicines.
- Do not let anyone smoke around pregnant women.

The best way to protect children is to take care of their mothers.

More severe birth defects

Some birth defects are so severe they will lead to the death of the baby. This is a very painful time for the family and community. As a health worker, you can help the family to talk about their sadness and loss.



Cleaning and dressing the baby

Wipe off any blood and the baby's first bowel movement (a sticky black stuff called meconium) but do not give a bath. After two or three days, the family should bathe the baby regularly to clean up milk, spit-up, dirt, and feces.

When you dress the baby, use as many clothes as an adult needs, plus one layer. For the first week or two, cover the baby's head – they lose a lot of heat through their heads. Change clothes or diapers as soon as they are wet or dirtied with stool. If the skin gets red or there is a rash under a diaper, leave the clothes or diaper off to help it clear.



Many mothers want to protect their babies from bad air with lots of clothes or blankets. This can make the baby too hot! One extra layer is enough.

Check the Baby Often During the First 2 Months

The midwife or another health worker should continue to look after the mother and baby after the birth. Mothers and babies can come to a clinic for checkups, but when possible the first checkups should be at home so they do not have to travel or be exposed to sick people at a clinic. Check the baby and mother the day after the birth, 3 days after the birth, and 1 week after the birth. Another visit at 6 weeks is helpful. Visit more often if there are any signs of problems. Visiting often is the best way to notice health problems before they become deadly.



For a healthy baby, take care of the mother

All babies need love, care, and attention to survive and thrive. To give this care and attention, the mother must have time, energy, health, and emotional well-being. Helping the mother with her work and her other children, caring quickly for her health problems, bringing her food, firewood or water – all these are ways both to help the mother and to ensure the baby stays well. Do not wait for a mother to ask for help. All mothers need help. And the mothers who do not ask are often the ones in the most need.

Health Problems of New Babies

*Diseases that take days or weeks to kill adults
can kill a baby in a few hours.*

A healthy baby breathes easily, without struggle. He should breastfeed every 2 to 4 hours and wake up on his own when he is hungry or wet. His skin should be clear, or have only a little redness or a small rash that clears in a few days. A baby who does not do these things could be in trouble and should get help fast.

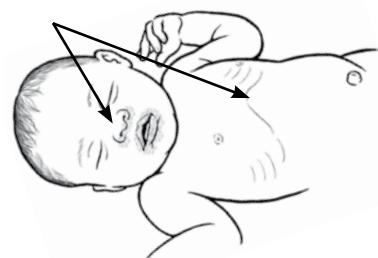
Infection

Infection in a newborn baby can be very dangerous and requires treatment with antibiotics right away (see pages 24 to 25). Depending on how far you are from a health center and what medicines you have, you should either get help immediately or give treatment yourself – even if only on the way to get help.

DANGER SIGNS

- **Fast breathing:** more than 60 breaths a minute while sleeping or resting.
- **Struggling to get air:** chest sucking in, grunting, nose flaring open from the effort, while sleeping or resting.
- **Fever, over 37.5° C, or low temperature,** less than 35.5° C.
- Severe rash with many pimples or blisters. (Small rashes are normal.)
- **Not feeding.**
- **Rarely waking,** or seeming to not respond to you.
- **Seizures:** loss of consciousness and jerking movements.

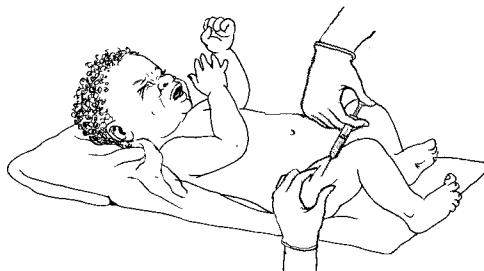
Any of these signs means the baby needs treatment.



TREATMENT

If you suspect an infection but it is not severe, give ampicillin or amoxicillin (pages 24 to 25), but for a severe infection, inject ampicillin and gentamicin right away (see page 25) and get medical help. The exact amounts of medicine depend on the age and weight of the baby.

The baby should start to get better within 2 days. If he is not improving by then, different antibiotics are needed to save his life.



Antibiotics in tablets can be crushed and mixed with breastmilk and fed to a baby, but some antibiotics must be injected. These go in the long muscle on the side of the thigh. Medicines, Tests, and Treatment (in development) explains how to safely give injections.

If the mother had a fever during labor, be extra watchful of danger signs in the baby. Likewise, a baby who passed stool inside the womb can sometimes breathe in this stool at birth. (The waters would have had chunks of brown or looked greenish from stool. Or the baby's skin might have been stained a bit yellow at birth.) This can cause infection of the lungs in the first few days, so be ready to quickly treat the baby at the first sign of infection.

Crying

Some babies cry more than others. A baby who cries a lot is probably OK if her other health signs are normal. Check if she breathes normally when she is not crying.

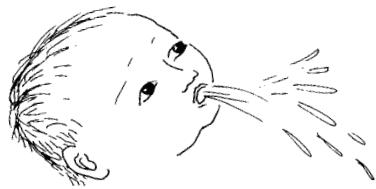
Near-constant crying, which often gets worse at night, is called colic. It should get better by about 3 months. This is usually harder on the family than on the baby. Be kind to new mothers. Make sure they get the rest and help they need.

If the baby cries for much of the day and also does not eat, has a fever, or has trouble breathing, this could be a sign of infection, see page 12.



Vomiting

Vomiting is when the baby's body uses force to vomit, not when the milk is just spilling out. Vomiting may not be a problem but see a health worker right away if a baby has any of these danger signs.



DANGER SIGNS

- Vomits over and over, or cannot keep anything in his stomach
- Vomits blood
- Has signs of dehydration

It is not dangerous when babies burp up milk. Sometimes there is a lot and it can come from the mouth or nose. Burping up milk is not a problem as long as the baby nurses often and gains weight, burping or spitting up is not harmful. Try holding him upright after he eats.



Hold the baby over your shoulder or knee and gently pat his back to burp him after he eats. This will help bring up air he swallowed while feeding.

Dehydration (not enough fluid in the body)

Babies easily become dehydrated, and in babies dehydration is especially dangerous.

CAUSES

- Diarrhea
- Vomiting
- Breastfeeding less than every 2 to 4 hours
- Eating or drinking anything that is not breast milk (like formula, porridge, or water)
- Hot weather

SIGNS

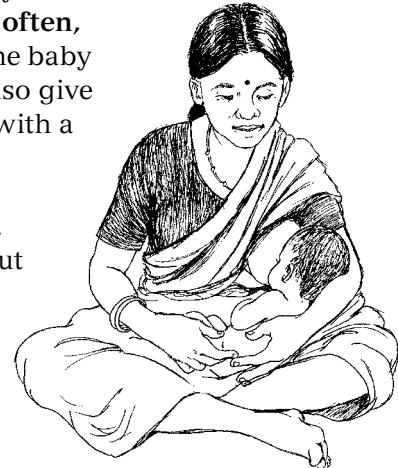
- Urinating less, or dark, strong-smelling urine
- Dry mouth and tongue
- Dull-looking eyes or skin

Severe dehydration can cause sunken eyes, a sunken soft spot on the top of the head, weight loss, and unresponsiveness.

TREATMENT

At the first sign of dehydration, or if the baby has diarrhea or has been vomiting, **nurse more often, for as long as the baby will drink**. Wake the baby up to drink at least every 2 hours. You can also give rehydration drink, a simple recipe of water with a little salt and sugar – explained on page 22 in Belly Pain, Diarrhea, and Worms. Give rehydration drink after you breastfeed. Very rarely, a mother nurses often enough but does not produce enough milk. See page 20.

If a dehydrated baby does not start to improve in a few hours, get medical help to get fluid in the baby.



Rashes

Newborns get rashes, blotches, and differences of skin color that are mostly harmless and go away on their own. A rash on the baby's bottom is caused by the skin staying wet with urine or feces. Clean the area more often. Change diapers and wet clothes as soon as they get wet or soiled. For an older baby and on a warm day, you can leave his bottom bare to heal. Zinc oxide cream can help. If it does not heal in a few days, it may be a yeast infection. Use nystatin cream (see page 28).

Measles, chickenpox, and rubella are viruses that can cause a rash that spreads to different parts of the body. Usually a fever comes first, then the rash. Some illness from mosquitoes, like dengue and chikungunya, can cause a rash on the body.

Jaundice

Yellow skin or eyes is called jaundice. For a dark-skinned baby, check the eyes. Normally, the baby's yellow color goes away in a few days with enough breastfeeding. Wake her every two hours to nurse. Sunlight also helps. If it is warm enough, take off the baby's clothes, cover her eyes, and have her in the sun for 5 minutes once or twice a day. (Too long will burn the baby's skin.)

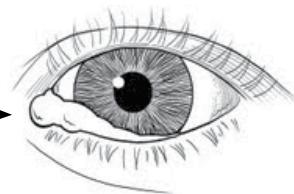
Rarely, a baby can have severe jaundice, which is dangerous. Get help for any of these signs.

DANGER SIGNS

- The jaundice starts right away – in the first 24 hours of life.
- Jaundice starts later, but covers the whole body.
- The jaundiced baby is very sleepy, or cannot be woken to eat.

The eyes

The tiny holes that allow tears and oil to moisten the eye can get stopped up and then the eyes get goopy. → Wipe them clean with a warm, wet cloth. Use a different cloth on each eye. This way if there is an infection in one eye, it will not spread to the other.



Many women have chlamydia or gonorrhea and do not know they are infected. Antibiotic eye treatment right after birth (see page 27) will prevent eye problems from gonorrhea that has passed from the mother to the baby.

A red, swollen eyelid with bloody pus after the baby is 5 days old is likely a chlamydia or gonorrhea infection in the eye. The treatment for chlamydia is erythromycin by mouth, by grinding it up and mixing it into a little breast milk for the baby. The treatment for gonorrhea is an injection of ceftriaxone. If you cannot test to know which disease is causing the infection, give medicines for both (see page 26). The mother and father should also be treated for chlamydia and gonorrhea. See Genital Problems and Infections (in development). If an eye infection does not improve in a day or two, you need another antibiotic to prevent blindness. Get help.

The soft spot

The soft spot on the top of the head should be flat. A sunken or swollen soft spot are both signs of very dangerous problems.



A sunken soft spot is a sign of dehydration. Give more breast milk and rehydration drink. See page 22 in Belly Pain, Diarrhea, and Worms.



A swollen soft spot is a sign of meningitis. Give antibiotics. See page 13 in Caring for Children.

The cord

After the cord is cut, leave the stump alone. Do not cover it. Keep diapers and clothes away. Avoid touching it, but if you must touch it, first wash your hands with soap and water. If the stump or belly button becomes dirty or caked with dried blood, clean with soap and water and a very clean cloth.

If the mother does cover the cord stump with a band or cloth, make sure it is clean and loose, and change the cloth a few times each day.

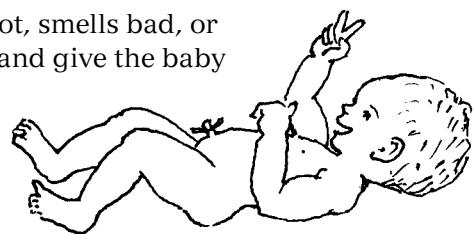
The stump should dry and fall off in about a week.

If the area around the cord becomes red or hot, smells bad, or drains pus, it is probably infected. Clean it well and give the baby amoxicillin. See pages 24 to 25.

If the baby has a grimace, cannot nurse, or seems stiff, especially if the area around the cord seems infected, she may have tetanus.

This is an emergency.

See page 20 in First Aid.



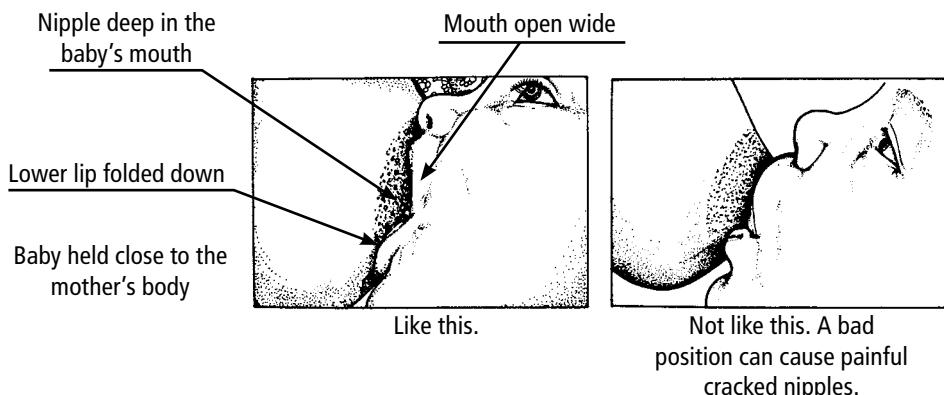
Keep away from the baby's cord – and you will keep infection away too.

Breastfeeding

Breast milk is better for a baby than any mix or formula.

A first-time mother may need help with breastfeeding. Help her stay calm and focused. Prop her up with blankets and pillows so she is sitting upright and comfortable. Ask family and visitors to give the mother and baby some privacy. Be encouraging. Breastfeeding becomes easier with time and practice.

Avoid painful, cracked nipples with a good breastfeeding position. Turn the baby's whole body toward the mother so his neck is not twisted. Wait until he opens his mouth wide. Then bring him onto the breast. The nipple and much of the dark area surrounding it (areola) should be deep in his mouth.



The first milk is like liquid gold

The first milk, called colostrum, comes in small amounts, but it is the right amount for a new baby. (Their stomachs hold only a few teaspoons at a time.) Colostrum is sticky and looks yellowish, but even though it looks different, it is the perfect food for a new baby. It contains antibodies – substances made by the mother's body that protect the baby from infection. Do not throw the first milk away: it is worth more to a baby than any medicine. Breastfeeding in the first 2 days is also important because it brings the mature milk that the mother begins to produce in about 3 days after birth. The more the baby nurses, the more milk the mother will make.

Is the baby getting enough milk?

Do not let anyone tell you that you cannot produce enough milk for your baby, especially in the first few days when your body is just starting to produce milk.

Because of pressure from others and self-doubt, mothers (or grandmothers or aunties or nurses who are trying to help) give formula, or porridge, or some other food to a new or young baby. These extra foods are a waste of money and can cause diarrhea in the baby. Diarrhea causes the baby to lose weight and become weak. And using these extra foods makes the mother produce less milk. So she becomes even more convinced she cannot feed the baby enough with just her breasts. If you are a health worker, you can prevent this cycle of serious health problems by showing mothers that you believe in their ability to nurse. Help with positioning the baby, but also give the mother time to learn for herself how nursing works. Speak gently. Be patient.

To make enough milk

- Nurse often. The more you breastfeed, the more milk you will make.
- Drink enough fluids and eat more. Feed your baby by feeding yourself.
- Rest often. When the father and family help with chores, the mother can better care for her new baby.

The more you breastfeed, the more milk you will make.

Most babies lose a little weight in the first week, which is normal. After that, weight loss means the baby is not getting enough to eat. Similarly, babies do not urinate much on the first day, but after that should start passing urine every few hours. If a baby does not urinate much after two days, he is not getting enough milk. But what if the baby is nursing often and does not urinate or grow? In these rare cases, you may need to substitute with another milk (see page 20). Do not give sugar or rice water. Do not give packaged formula unless you are sure you can afford to give the recommended amount (watering it down causes diarrhea and sickness). And do not use bottles: they are hard to clean so they spread germs that cause diarrhea.

Other milk must be given if the mother dies or is separated from her baby, or in the rare case that she truly is not making enough milk. You can ask another mother to breastfeed the baby. She should get an HIV test to know if this is safe, because HIV can pass to the baby through breastfeeding.

Another option is to make an animal milk formula:

Mix:

2 parts cow or goat milk → 
 1 part water →
 1 large spoonful of sugar →

OR

1 part sheep milk
 1 part water
 1 large spoonful of sugar

OR

2 parts canned evaporated
 (not sweetened) milk
 3 parts water
 1 spoonful of sugar

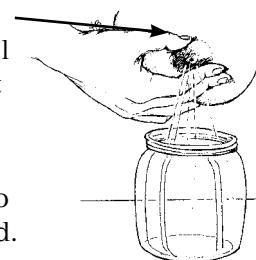
Briefly boil your formula to kill germs. Then let it cool and feed it to the baby with a clean cup or spoon.

Milking the breast by hand (extracting milk)

If you must go to work or leave the baby for another reason, you can try milking the breast and when you are gone someone else can give the baby your milk.



1. Wash your hands and a jar. Boil the jar if you can.
2. Hold your fingers and thumb at the edge of the dark part of the breast (areola). Press toward the chest. Then press your fingers together as you roll forward toward the nipple. Relax and think about the baby while you extract the milk – it can help the milk come down.



Breast milk will keep about 8 hours if it is not too hot outside. It will keep longer if you can keep it cold.

Thrush

White patches on the tongue or inside the cheeks and irritability with nursing can be signs of a yeast infection of the mouth, called thrush. This infection can spread to the mother's nipple and cause redness, itching, and pain.

Try rinsing the nipple with a little vinegar, and then water. Or if you have no vinegar, just gently rinse and dry the nipples after each time you nurse. If this does not cure the thrush, paint a little gentian violet on the nipple 2 times a day for 3 days. Also paint the inside of the baby's mouth once a day. (This will turn everything purple, but it is safe.) See page 27.

If gentian violet does not help, give the baby nystatin. See page 28.

If thrush keeps coming back again and again, the baby may have another problem that is weakening her ability to fight the infection. For example, babies who have HIV may get thrush many times. See HIV and AIDS (in development).



Use a small, clean piece of cloth to spread the medication inside the baby's mouth.

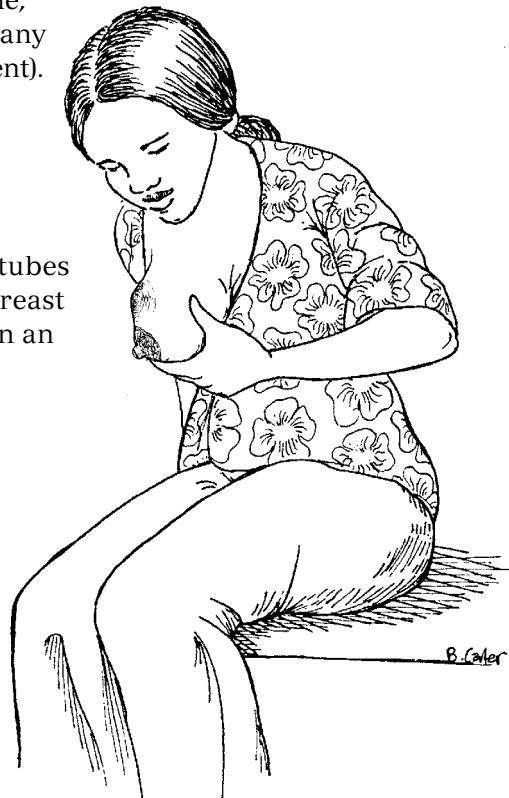
Breast pain, swelling, blockage, or infection

Sometimes milk clogs a duct (the small tubes inside the breast that carry milk). The breast becomes swollen, red, and painful. Soon an infection can start.

SIGNS

- A hot, red, hard area on one breast.
- Pain in the breast and while breastfeeding.

If there is fever, then the blocked duct has become infected.



TREATMENT

- Rest. Drink fluids.
- Breastfeed at least every 2 hours. Breastfeeding with a breast infection is safe for the baby and is the best way to flush out the infection.
- Be sure you have a good breastfeeding position. The baby's whole body should face the mother. The baby's mouth should open wide, and the nipple should go deep in the baby's mouth.
- Breastfeed on the sore side first, and let the baby empty that breast.
- Warm, wet cloths or a hot bath can help. Warm the breast for 15 or 20 minutes, at least 4 times a day. Or, put cool cloths or cabbage leaves on the breast to relieve the swelling.

If there is fever, give 250 mg erythromycin, 4 times a day. See page 26.



HIV and breastfeeding

Pregnant women with HIV can take medicines to stay healthy and also prevent their babies from getting HIV. To protect women and children, every pregnant woman should be able to get an HIV test. And if she has HIV, she should be provided with HIV medicines during pregnancy, and for the entire time she is breastfeeding which will protect her baby from HIV, and afterwards for her own health. See HIV and AIDS (in development).

Is it safe to breastfeed when you have HIV?

HIV medicines taken by the mother and the baby prevent babies from getting HIV during breastfeeding. The baby must take medicines every day for at least 6 weeks. If the mother did not get HIV medicines through her entire pregnancy, give the baby medicine for at least 12 weeks. If the mother is not taking HIV medicines, give the baby medicine until 1 week after the baby stops breastfeeding. The baby's health is also protected by giving only breast milk for the first 6 months (or until he gets his first teeth). Giving porridge and other drinks before 6 months is not healthy for the baby and can make HIV infection more likely.

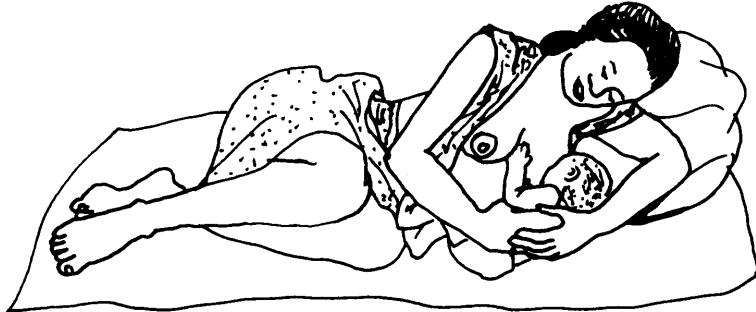
*HIV medicines for the mother and her baby
will keep both of them healthy.*

When there are no HIV medicines, there is some risk of HIV passing through breast milk. But the risk of sickness from giving formula is much greater. Most mothers with HIV do not have the clean water, fuel, or money to safely get, prepare, and give formula. Their babies are likely to become malnourished and get diarrhea, and they may die. What this means is breast milk is safest – even when the mother or baby is not taking HIV medicines.

For babies and mothers everywhere, breast is best

Breastfeeding

- Is much less expensive. You do not need to buy formula, bottles, or anything else.
- Helps stop the mother's bleeding after birth.
- Helps prevent pregnancy in the months after birth.
- Protects the mother from cancers and weak bones later in life.
- Is always fresh, warm, and ready-to-eat.
- Has all the nutrients a new baby needs.
- Helps protect babies against diarrhea, pneumonia, and other illnesses.
- Gives long-term protection against diabetes, allergies, and cancers later in the baby's life.
- Keeps the baby safe and warm next to the mother.
- Brings the mother and baby closer together.



Newborn Babies and Breastfeeding: Medicines

Antibiotics Fight Infection

Ampicillin and Amoxicillin

Ampicillin and amoxicillin are broad-spectrum penicillins, which means they kill many kinds of bacteria. The two are often interchangeable. When you see a recommendation for ampicillin, you will often be able to use amoxicillin in its place, in the correct dose (see below).

Ampicillin and amoxicillin are very safe. They are both useful in treating pneumonia or ear infections. Ampicillin is also useful in treating meningitis and other severe infections in newborns.

Side effects

Both these medicines, but especially ampicillin, tend to cause nausea and diarrhea. Avoid giving them to children who already have diarrhea if you can give another antibiotic instead.

The other common side effect is rash. But, raised, itchy bumps that come and go in a few hours are probably a sign of penicillin allergy. Stop giving the medicine right away and do not give the child a penicillin medicine again. Future allergic reactions may be more severe and even life-threatening. For some problems erythromycin can be used instead, see page 26. A flat rash that usually appears a week after starting the medicine and takes days to go away, is not necessarily an allergy. But it is impossible to know for sure if the rash is from allergy or not, so it is usually better to stop taking the medicine.

Important

Resistance to these medicines is growing more common. Depending on where you live, they may not work any more against staphylococcus, shigella, or other infections.

How to use

Ampicillin and amoxicillin work well when taken by mouth. To give tablets or capsules to a baby, crush the pills or empty the capsules and divide the powder to get the amount you need. Then mix it into a little breast milk. Feed the milk and medicine to the baby with a cup or spoon. Ampicillin can also be given by injection, but should only be injected for severe illnesses such as meningitis, or when the person is vomiting or cannot swallow.

As with other antibiotics, always give these medicines for at least the shorter number of days shown here. If the person still has signs of infection, have her continue taking the same amount every day until all signs of infection have been gone for at least 24 hours. If the person has taken the medicine for the maximum number of days and is still sick, stop giving the antibiotic and get medical help. For people with HIV, always give the medicine for the maximum number of days listed.

Likewise, the amount of antibiotic to take depends on the age or weight of the person and the severity of the infection. In general, give the smaller amount for a thinner person or a less severe infection, and the larger amount for a heavier person or a more severe infection.

AMOXICILLIN

For most newborn infections

- Give 62 mg, 3 times a day for 3 to 7 days. Each dose is:
 $\frac{1}{4}$ of a 250 mg capsule **OR**
 $\frac{1}{2}$ teaspoon (2.5 ml) of 125 mg/5 ml syrup **OR**
 $\frac{1}{4}$ teaspoon (1.25 ml) of 250 mg/5 ml syrup.

AMPICILLIN

For most newborn infections

- Give 125 mg, 3 times a day for 3 to 7 days. Each dose is:
 $\frac{1}{2}$ of a 250 mg capsule **OR**
1 tsp (5 ml) of 125 mg/5 ml syrup.

For severe infections in newborns such as meningitis

Inject a combination of ampicillin and gentamicin in the side of the thigh muscle. See Medicines, Tests, and Treatment (in development) for how to inject.

Dilute a 500 mg vial of ampicillin with 2.1 ml sterile water. This makes a concentration of 500 mg per 2.5 ml. Use an undiluted 2 ml vial of gentamicin at 40 mg per ml.

Important

Gentamicin is a very strong antibiotic of the aminoglycoside family. It can only be given by injection or IV (in the vein). This drug can damage the kidneys and the hearing, and therefore should only be used in emergencies on the way to get medical help. If the baby is dehydrated, also give breast milk and rehydration drink immediately. See pages 14 and 15.

For a baby less than 1 week old

- AMPICILLIN Inject 50 mg per kg, 2 times a day for at least 5 days,
AND
GENTAMICIN Inject 5 mg per kg, once a day for at least 5 days.
Do not give for more than 10 days.

For a baby 1 week to 1 month old

- AMPICILLIN Inject 50 mg per kg, 3 times a day for at least 5 days,
AND
GENTAMICIN Inject 7.5 mg per kg, once a day for at least 5 days.
Do not give for more than 10 days.

Erythromycin

Erythromycin works against many of the same infections as penicillin and can be used by those who are allergic to penicillins. For many infections it can also be used in place of tetracycline. It can also be used for diphtheria and pertussis (whooping cough).

Side effects



Erythromycin often causes nausea and diarrhea, especially in children. Do not use for more than 2 weeks as it may cause jaundice.

How to use



For newborns up to 1 month old

- Give 30 to 50 mg per kg each day, divided into 3 doses a day. Give for 7 to 10 days.
 For an average-sized newborn of about 3 kg, each dose should be:
 0.75 ml (this is a bit more than $\frac{1}{8}$ teaspoon) of 250 mg/5 ml erythromycin syrup, **OR**
 62 mg ($\frac{1}{4}$ of a 250 mg tablet) ground up in a little breast milk or water.

For breast infection (mastitis) in a breastfeeding mother

- Give 250 to 500 mg (1 or 2 tablets of 250 mg), 4 times a day for 10 days.

Ceftriaxone

Ceftriaxone is in the cephalosporin antibiotic family. Cephalosporins are antibiotics that work against many kinds of bacteria. They are often expensive and not widely available. However, they generally have fewer risks and side effects than many other antibiotics and can be useful in treating certain serious diseases, including sepsis and meningitis, and for infections resistant to penicillin. Only use ceftriaxone to treat the specific infections for which it is recommended in your area. This will help prevent resistance and keep this drug useful. Ceftriaxone is especially useful for gonorrhea, including gonorrhea infection of the newborn's eyes but otherwise should not be given to newborns under 1 week old and should be avoided in babies under 1 month old.

Important



Do not give ceftriaxone to a baby less than 1 week old. Avoid in babies who were born early or especially small (if there is a chance that they may have been early). Do not give if there is jaundice.

How to use



Ceftriaxone is only available for injection or IV (in the vein). It can be painful to inject. Mix with 1% lidocaine if you know how.

For gonorrhea eye infection in the newborn 7 days or older

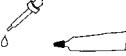
- Inject 50 mg per kg, one time only. Do not give more than 125 mg.

For severe infection when other antibiotics are not available, in a baby or child older than 7 days

- Inject 75 mg per kg, once a day for 7 to 10 days. So:
- For a newborn of 3 kg**, inject 225 mg once a day.
- For an older baby of 6 kg**, inject 450 mg once a day.

Antibiotic Eye Treatments

Antibiotic eye ointment and drops are used to protect the newborn baby's eyes from severe infection and blindness that can occur if the mother has gonorrhea, a sexually transmitted infection, during birth. They are also used to treat other eye infections caused by bacteria.

How to use 

Use one of these antibiotic ointments with every newborn baby in both eyes to prevent gonorrhea infection:

1% tetracycline OR 0.5% to 1% erythromycin

- Put a thin line of ointment in each eye, 1 time only, within 2 hours after the birth. Gently pull down the lower eyelid and squeeze a thin line of ointment along the eye moving from the inside corner outward. Do not let the point of the tube touch the baby's eye.

If there is no ointment, use one of these kinds of drops to prevent infection:

2.5% solution of povidone-iodine OR 1% solution of silver nitrate

- Put 1 drop in each eye, 1 time only, within 2 hours after the birth. Pull down the lower lid and squeeze 1 drop into the eye. Do not let the dropper touch the eye.

Silver nitrate becomes more concentrated over time as it evaporates – so do not use old silver nitrate. It will burn the baby's eyes. If in doubt, it is better to avoid using silver nitrate at all.

For Thrush (Candida, Yeast Infection)

Gentian violet, GV, crystal violet, methylrosanilinium chloride

Gentian violet is an inexpensive treatment for yeast infections in the mouth, on the nipples of a breastfeeding mother, in skin folds, or on the vulva or vagina. It also works against some bacterial skin infections.

Side effects 

Gentian violet can irritate the skin and cause sores when used on the mouth or vagina. Stop using if a rash or sores develop.

Important

Gentian violet turns everything purple. It fades off the skin in a few days but can permanently stain cloth.

How to use

- Use a solution of 0.5% methylrosanilinium chloride (gentian violet).
Paint it on the skin, in the mouth, or on the vulva 2 or 3 times a day.

If the infection does not start to heal within a couple of days, try another medicine.

Nystatin

Nystatin works well for most yeast infections in the mouth, on the nipples or skin, or in the vagina. For use in the mouth, nystatin comes in a liquid, powder that is mixed with water, or as a lozenge (pastille). For the skin, it comes as a cream, an ointment, or a powder. For a yeast infection in the vagina, nystatin comes in vaginal tablets or cream that goes inside the vagina.

Side effects

The skin may become irritated where nystatin is used. This is uncommon. Stop using if you get a rash. Nystatin sometimes causes diarrhea.

Important

A yeast infection that does not get better with nystatin, or keeps coming back again and again, can be a sign of HIV.

How to use

Liquid nystatin usually comes in 100,000 Units per ml. Most people should use 1 mg (100,000 Units) to 2 ml (200,000 Units) in each dose, but people with HIV may need as much as 5 ml (500,000 Units) in each dose.

For a baby with thrush in the mouth

- Give 2 ml, less than ½ a teaspoon of liquid (200,000 Units), 4 times a day.
Use a little clean cloth or dropper to spread the nystatin inside the mouth. Keep giving the medicine for 2 days after the yeast infection is gone, or it may come back.

For a breastfeeding mother with yeast infection of the nipples (itching, redness, or pain)

- Put 1 to 2 mg (100,000 to 200,000 Units) of nystatin cream, powder, or liquid on her nipples 4 times a day.

For rash on baby's bottom or genitals caused by a yeast infection

After changing the baby's diaper, use nystatin cream 3 to 4 times a day on the affected bottom and genital areas. Make sure the area is clean and dry before putting on the cream. Keep using the cream for 3 days after the yeast infection is gone, or it may come back.

To Stop Bleeding in Newborns

Vitamin K, phytomenadione, phytonadione

The body uses vitamin K to clot blood and stop bleeding. But babies are born without much vitamin K, so if for some reason they start bleeding it can quickly get out of control. If a newborn starts to bleed from any part of his body (mouth, cord, anus) you can give vitamin K to prevent excessive bleeding. You can also give vitamin K to very small or early babies (under 2 kg) to prevent bleeding because they are more likely to bleed.

Vitamin K does not stop bleeding in older children or adults.

How to use

- Inject 1 mg (one 1 mg ampule, or ½ of a 2 mg ampule) of vitamin K into the outer part of the thigh within 2 hours after birth.

Do not inject more, it will not help and can harm.

Vaccines Prevent Illness

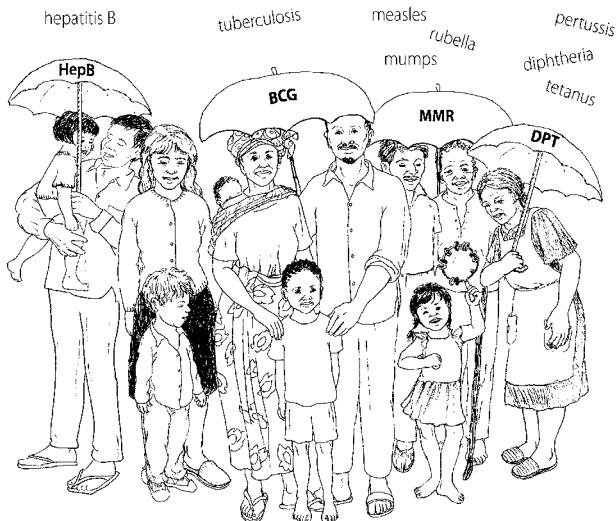
Vaccinations, also called immunizations, can prevent many illnesses that might otherwise make people sick or even cause death. Vaccines work by strengthening the body's immune system, the part of the body that fights off infection and disease so the body can regain health. If the immune system is prepared and strong, it quickly recognizes threats to health and already knows how to fight them. Vaccines do not give you the illness.

How do vaccines work? A vaccine is made of a mild or inactive germ and its presence shows the body how to stop similar germs in the future, before they make the person sick. The way the body builds this protection is by creating specific "antibodies" to successfully fight illness. These antibodies protect you and others that live around you against the germs that cause the illness.

Babies are born with some of the antibodies they need, which come directly from their mother. When mothers breastfeed, this strengthens the baby's immune system even more. Vaccinations build the baby's immune system as they get older. Just as good nutrition helps a child's body grow, vaccinations help grow the immune system.

Vaccinations work. Some sicknesses that killed or disabled many people in the past, such as smallpox, are now gone and the vaccine is no longer needed. Others illnesses targeted by vaccines are becoming less common. Vaccinating all babies and children, and also adults as needed, can keep many illnesses from spreading or returning.





A vaccine protects the person who receives it, and this protects others when enough people are vaccinated. If the disease cannot find new people that are unvaccinated, it cannot spread. Over time, with more people vaccinated, there will be fewer and fewer cases.

There is strength in numbers! When most people are vaccinated, their resistance to illness protects others who are too young or too sick to get the vaccination. This is called herd immunity.

Learn about vaccines and why we need them

Vaccines protect children from many dangerous diseases, including whooping cough, tetanus, pneumonia, measles, hepatitis B, tuberculosis, and diarrhea caused by rotavirus infection. The vaccine against HPV (a type of virus) prevents some cancers.

If your children are vaccinated, they will be protected from serious illnesses.

Vaccinations are usually free of cost for babies and children and every country has its own schedule for when each is given. Health workers schedule visits for babies and children to make sure they are growing well, and to give the vaccinations they need to stay healthy.

Many vaccines are given more than once to help our bodies build strength against a certain disease. After a person receives the main set or series of the same vaccine, for example, 3 injections over 6 months, they may still need one or more booster vaccinations later. When the effect of the vaccine wears off, a booster is a reminder to the body about how to fight off the illness.



? What if my child is sick when vaccinations are scheduled?



→ Vaccinations can be given to someone with a cold or minor illness. If a child has a serious health problem, the health worker will tell the family if a vaccination should be delayed. When others in the family and the community are vaccinated, it will help prevent sickness in those who cannot receive a vaccine.

? Are vaccines safe?



→ Vaccines are safe. They do not give the illness. Some vaccines may cause some aches or a mild fever, but that will go away quickly. If you hear rumors that a vaccine is unsafe, talk to trusted health workers to get reliable information.

? Are vaccinations only for children?



→ All children need vaccines but the need for vaccinations does not end after childhood. For some illnesses, older children and adults will need additional injections, called "boosters," to stay protected. This is because over time, the effect of some vaccines wear off. Pregnant women are also vaccinated to protect the mother and the baby's health. Older people or a person with a serious illness may benefit from a vaccination to protect against an illness such as influenza that their body may not resist well.

? The number and type of vaccinations have changed compared to my first child. Why?



→ For some diseases, more than one pharmaceutical company makes a vaccine that is safe and works well. They may have different schedules. So if two countries use a different vaccine brand, or the same country changes from one to another, the schedule of injections may change too. Other changes happen when a new vaccine is created or an old one is no longer needed.

Who Needs Vaccinations and When?

Each region, country, and sometimes each district within a country has its own list of needed vaccines:

- Some vaccines are given to almost everyone—infants, children, and adults. Older children or adults who missed vaccinations given to infants may still get them later.
- Some vaccines are useful only in certain regions and are given only to people who live or visit there.
- Some vaccines are not needed for everyone but are recommended for certain groups, such as women who are pregnant, health workers, or older people.
- When a disease is new to a region, usually everyone will need the vaccine.



*In my culture, everyone is family.
 By vaccinating our children, we
 protect everyone now and also
 help the future generations.*

Routine vaccinations protect babies and children

Health workers give babies several check-ups during their first year of life. This is also when they give most vaccinations. Which ones and when each is given will depend on the health recommendations in your country.

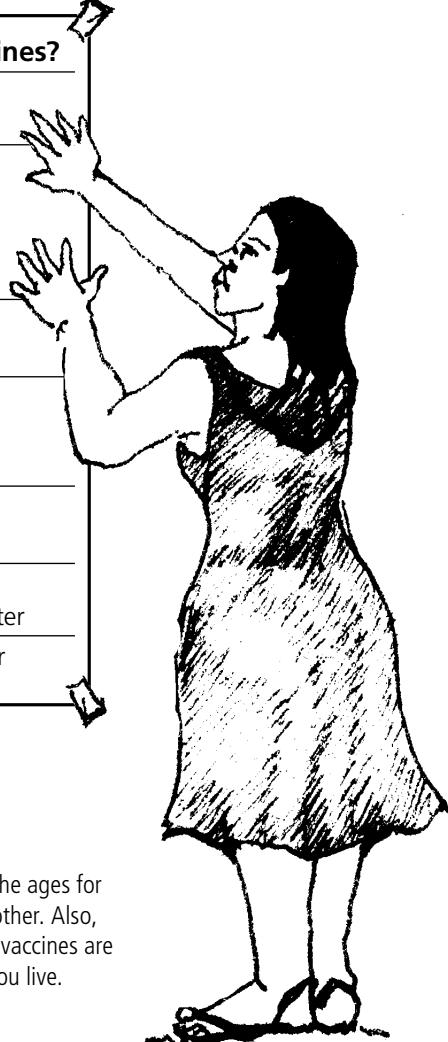
To keep babies and children healthy, vaccinations are very important but so are the living conditions that prevent disease. Safe drinking water, good sanitation, breastfeeding for at least the first 6 months of life, and good nutrition will prevent much illness. (See the chapters Water and Sanitation: Keys to Staying Healthy and Good Food Makes Good Health.)

Vaccines and vaccine boosters are given to adults when another dose of vaccine is needed beyond childhood for the protection to last or because they did not receive all their vaccinations as children.



Health authorities in each country recommend a schedule for vaccinating babies and children. It shows which vaccinations are given together and at what age. When 2 vaccines cannot be given together, it is often because they do not work as well when they are put in the body at the same time.

When do children in our country need vaccines?		
At birth		BCG HepB
2 months	1st dose each:	polio pentavalent rotavirus pneumococcal
4 months	2nd dose each:	
6 months	3rd dose each	polio pneumococcal
9 to 12 months		1st MMR pneumococcal booster
18 months		2nd MMR polio booster
4 to 6 years		DPT 2nd polio booster
9 to 11 years		Tetanus booster 2 doses of HPV



A vaccination schedule often looks similar to this one, although the ages for each group of vaccines may be different from one country to another. Also, not every country uses the same combination vaccines and not all vaccines are needed everywhere. Find out what is recommended where you live.

Vaccines and HIV

In general, babies and adults with HIV need the same vaccinations as other people. In some cases, a child or adult with HIV may need an extra dose, as with the measles vaccine.

For a few vaccines (BCG, MMR, OPV), make sure health is stable and get HIV treatment medicines started before vaccination. HIV treatment makes the body's immune system stronger and this makes the vaccinations work even better.

For the BCG vaccine, it is safe to give at birth even if the mother has HIV. However, if the child is older and has HIV, treat the HIV first.

Vaccines and pregnancy

Vaccines protect the health of the mother and the developing baby. Also, the pregnant woman passes antibodies from vaccines to her unborn child that help protect the baby after birth. Newborns are too young for some vaccines in their first weeks or months of life.

Share this information with parents of girls and with women who are pregnant:

- Vaccinations do not affect a girl or a women's ability to become pregnant.
- Most vaccines are safe to get during pregnancy.
- When girls receive all their vaccinations as children, fewer vaccines are needed during pregnancy. The rubella (German measles) vaccine is a good example of a vaccine where it is helpful to give to children or young women before pregnancy because rubella in a pregnant mother is dangerous for a baby.
- Everyone needs the tetanus vaccine repeated over the years, either as a single vaccine or as a part of a combination vaccine. If a woman has not had a vaccine against tetanus recently, she will need one during pregnancy. The vaccine prevents dangerous tetanus infection in a newborn caused by an unsterile tool used during childbirth.
- In your country, health workers may recommend other vaccines during pregnancy, such as whooping cough or flu vaccines.

Some vaccinations are avoided during pregnancy such as BCG or measles vaccines. When giving vaccinations, ask a woman first if she might be pregnant.

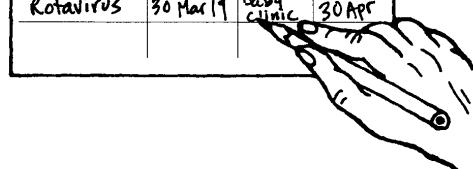


Being fully vaccinated as a girl means pregnancy later is safer. If you are thinking about getting pregnant, talk to a health worker to make sure all your vaccinations are up to date.

Keep a record

Ask for and keep any immunization cards or documents that show the name and date of vaccinations. Children often need these records to enroll in school and adults need them for work, travel, and to show health workers the vaccinations they have already received and those they still need. If they don't have the cards at your clinic, keep a record yourself and have the person who gave the vaccination fill out the information and sign it.

IMMUNIZATION RECORD			
Name:	MIRA KUMAR		
Date of birth:	10 FEB 2019		
Medical conditions or allergies:			
Vaccine name and type	Date given	Given by	Next dose
BCG	10 Feb 19	Birth center	—
bOPV polio	10 Feb 19	Birth center	30 Mar
Hep B	10 Feb 19	Birth center	30 Mar
DTP-Hib-HepB	30 Mar 19	Baby Clinic	30 Apr
OPV polio	30 Mar 19	Baby Clinic	30 Apr
Rotavirus	30 Mar 19	Baby Clinic	30 Apr



Common Vaccines

In most countries, there are vaccines to protect against:

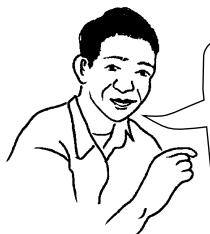
- Tuberculosis (TB)
- Tetanus
- Diphtheria
- Whooping cough (pertussis)
- Hepatitis B
- Haemophilus influenza type b, that causes several diseases
- Polio
- Rotavirus, a cause of diarrhea in infants and young children
- Pneumococcus, that causes pneumonia and other infections
- Measles
- Rubella (German measles)
- Human papillomavirus (HPV), that causes cancer of the cervix

Where needed, there are vaccines to protect against:

- Cholera
- Meningococcal infection
- Yellow fever
- Japanese encephalitis
- Tick-borne encephalitis
- Hepatitis A
- Chickenpox (varicella)
- Influenza (flu)
- Typhoid fever
- Rabies



BCG vaccine protects against tuberculosis (TB)	
<p>The BCG is an injection that goes just under the skin. It is given as soon as possible after birth.</p> <ul style="list-style-type: none"> • If anyone in a household has TB, and the children never received the BCG, vaccinate them as soon as possible. • Do not give BCG vaccinations to pregnant women. • A baby born to a mother with HIV can get the BCG at birth. For anyone with confirmed HIV, begin treating the HIV with antiretroviral medicines before giving the BCG. 	<p>Tuberculosis (TB) is a dangerous infection, usually in the lungs, that can be treated with medicine and cured. If untreated, TB slowly destroys the lungs and stops the person from breathing. The BCG vaccine helps prevent the most dangerous types of TB and helps the body resist other infections too.</p>



*Combination vaccines are created so fewer injections are needed. The **pentavalent** is a common combination vaccine to protect against 5 diseases with only 1 injection: diphtheria, pertussis, tetanus, hepatitis B, Hib. The **hexavalent** is used in some countries to protect against 6 illnesses: the same 5 as the pentavalent plus polio.*

DPT (also DTaP, Tdap) protects against diphtheria, pertussis, tetanus	
<p>The DPT vaccine protects against 3 diseases. The pentavalent and hexavalent vaccines include DPT. By 6 months old, babies get a series of 3 injections.</p> <ul style="list-style-type: none"> • Older children usually get 3 booster injections of DTP or a combination to prevent diphtheria and tetanus (Td, Dt). • DPT vaccine in pregnancy helps protect the baby. • Receiving all 6 doses of DPT (series of 3 and 3 boosters) gives protection from tetanus for decades. Tetanus boosters (TT) are needed if childhood series was incomplete or if you get a deep or dirty wound. 	<p>Diphtheria mostly affects children and can swell the throat so much the person cannot breathe.</p> <p>Pertussis causes a bad cough called whooping cough, making it hard to breathe. This is especially dangerous for babies.</p> <p>Tetanus can become deadly quickly. Any person can get it from a cut or wound. Newborns can get tetanus if the mother is not vaccinated.</p>
HepB (also HBV) protects against hepatitis B	
<p>By 6 months old, babies get a series of 3 or 4 injections.</p> <ul style="list-style-type: none"> • The first vaccination is given at birth and the others by age 6 months, either with the DPT series or as part of the pentavalent or hexavalent vaccines. • Vaccinate older children and adults with the series of 3 HepB injections if they did not receive them as a baby. 	<p>Hepatitis B causes serious liver problems and sometimes liver cancer. It can be passed from a mother to baby during birth, or between 2 people through sex or unclean needles.</p>
Hib vaccine protects against haemophilus influenza type b	
<p>By 6 months old, babies get a series of 3 injections, either with the DPT series or as part of the pentavalent or hexavalent vaccines.</p> <ul style="list-style-type: none"> • There may be a booster needed at 12 to 15 months. • Adults and children over 5 years old and adults usually do not need the Hib vaccine unless they have sickle cell anemia or immune system problems. 	<p>Haemophilus influenza type b is not like the influenza commonly called the flu. It is a germ that causes meningitis, pneumonia, skin and bone infections, and other serious illnesses.</p>

Polio vaccine (OPV, IPV) protects against polio	
<p>By 6 months old, babies get a series of 3 or 4 doses.</p> <ul style="list-style-type: none"> The first dose is given at birth and the others by age 6 months, along with the DPT series. The OPV (Oral Polio Vaccine) are drops given by mouth and the IPV (Inactivated Polio Vaccine) is given as an injection. Depending on the country, the polio vaccine series usually includes both the OPV and the IPV. 	<p>Polio is a virus that can lead to paralysis, breathing problems, and even death. Because so many people are vaccinated against it, polio has almost disappeared.</p>
The rotavirus (RV) vaccine protects against rotavirus	
<p>By 6 months old, babies get this vaccine 2 or 3 times, depending on the vaccine manufacturer. It is given as drops in the mouth.</p> <ul style="list-style-type: none"> Given at the same time as the DPT or pentavalent series. <p>For 2 weeks after the baby's vaccination, take extra care to wash your hands well when changing diapers to avoid mild illness.</p>	<p>Rotavirus is a common disease that causes severe diarrhea, fever, and vomiting. It spreads easily and is especially dangerous to babies and young children.</p>
Pneumococcal (conjugate) vaccine protects against pneumonia and other infections	
<p>Babies get a series of 3 injections.</p> <ul style="list-style-type: none"> The vaccination is usually given at the same time as the DPT or pentavalent series but some countries give the first 2 injections by 6 months and a third injection later. 	<p>This vaccine prevents serious lung, brain, and blood infections caused by pneumococcus germs.</p> <p>Vaccinating all children is the priority, but it also helps protect older adults against pneumonia.</p>
Measles, MR, MMR vaccines protect against measles	
<p>The vaccine is often given as part of a combination vaccine, either the MR (Measles and Rubella) or the MMR (Measles, Mumps, and Rubella). Children will need at least 2 doses.</p> <ul style="list-style-type: none"> In a measles outbreak, infants as young as 6 months may be vaccinated. They receive the normal 2 doses after that. A child with HIV also needs 2 or sometimes 3 injections but a child very ill from HIV, needs HIV treatment and stable health before vaccination. 	<p>Measles spreads easily among children and causes rash, fever and cough. If untreated, it can result in diarrhea, eye or ear infections, blindness, or death.</p>
Rubella, MR, MMR vaccines protect against rubella (German measles)	
<p>Children need at least 1 injection. Give with the first measles vaccine.</p> <ul style="list-style-type: none"> Many children receive 2 injections since the rubella vaccine is part of 2 common combination vaccines, the MR (Measles and Rubella) and the MMR (Measles, Mumps, and Rubella) that are given 2 times. In places where most people were not vaccinated as infants, rubella vaccine campaigns may focus on older girls. 	<p>Rubella can cause a rash and fever and will then go away. But if a pregnant woman gets rubella, it is very dangerous to her developing child.</p> <p>Vaccinating all children keeps rubella away and helps so pregnant women don't get it. Also, girls who are vaccinated won't get rubella if they become pregnant as adults.</p>

HPV vaccine protects against human papillomavirus	
<p>Girls need 2 or 3 injections, depending on their age.</p> <ul style="list-style-type: none"> The first injection is given between 9 or 10 years old, and the second six months later. For a woman who is already 15 years or older: give the first injection, wait 4 weeks for the second, and wait 12 weeks more to give the third. 	<p>The vaccine prevents cervical cancer in women and some cancers in men. It is most important for girls, but if budgets and supplies permit, some countries help boys to get this vaccination too.</p>

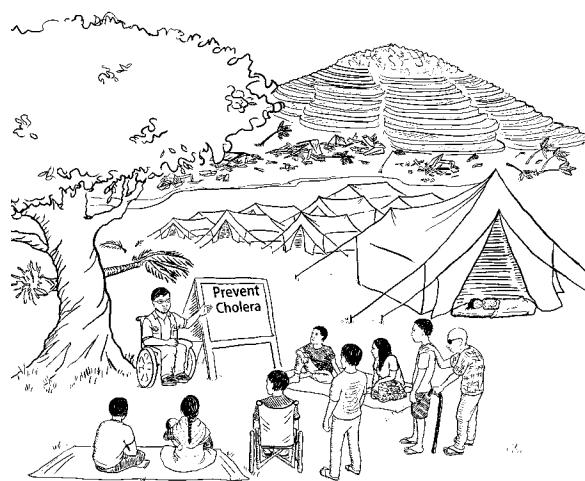
Vaccines used in only some regions and other vaccines that only some people need

Cholera

Cholera is a diarrhea disease that can quickly kill people through dehydration, especially babies and children, (see the chapter Belly Pain, Diarrhea, and Worms, pages 28 to 29).

The vaccine against cholera is taken by mouth and used where an outbreak has started or might occur, especially in camps or settlements where refugees or displaced persons are living. Either 2 or 3 doses will be needed depending on the vaccine manufacturer. If cholera returns to a region, people may need the complete series again or just 1 booster dose.

Pregnant and breastfeeding women and people with HIV should be included in any cholera vaccination campaign.



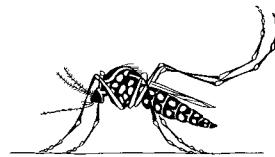
Meningococcal infection

This vaccine prevents a very serious meningitis brain infection most common in countries of northern and central Africa. The vaccine is for children and adults. Health workers will need it if there is an outbreak. It is safe for pregnant women. Either 1 or 2 doses will be needed, depending on the vaccine manufacturer. Different regions use the version of this vaccine matched to the type of meningococcal germ that is present.

Yellow fever

Yellow fever is a virus carried by mosquitoes. When yellow fever comes to a new area, it spreads quickly and is especially dangerous for young children.

Where yellow fever is common, vaccinate children with 1 dose at the same time as measles, at 9 to 12 months old. If yellow fever comes to a new region, vaccinate everyone, including babies older than 6 months.



Japanese encephalitis

Japanese encephalitis is a virus carried and spread by mosquitoes in parts of Asia. A vaccination campaign might first target all children younger than 15 years old. After that, only new babies will need to be vaccinated. Children need 1 or 2 injections, depending on the vaccine manufacturer.

Tick-borne encephalitis

This encephalitis is carried by ticks, tiny biting insects that burrow into the skin and are hard to see.

Children usually need 3 injections, the first at either 1 or 3 years old, a second 1 to 7 months later, and a third 9 to 12 months after the second one, depending on the type and vaccine manufacturer. Where tick-borne encephalitis is common, a booster will be needed every 3 to 5 years. Because the sickness is especially dangerous for older people, campaigns may focus on vaccinating adults over 50 years old.

Hepatitis A

Hepatitis A is spread by contaminated food or water and harms the liver. It causes extreme tiredness, sometimes for months. It goes away on its own and will not return. Where hepatitis A is common, there is no need for vaccination but where most people have never had the illness, the vaccine will prevent sickness.

Either 1 or 2 doses of vaccine is given depending on the manufacturer. When routinely given to children, the first injection is given at around 12 months old, and the second 6 to 18 months later.

Chickenpox (varicella)

This vaccine prevents chickenpox, an illness that causes fever, rash, itching, and tiredness during 1 or 2 weeks. Depending on the manufacturer, either 1 or 2 injections are given to every child, and sometimes to older children and adults.

Influenza (flu)

Influenza (flu) is the name for a group of viruses that spread for a few months every year, causing fever, chills, and other signs similar to common cold but more severe. Most people will recover from the flu, but it can be serious for babies, elders, or people with health problems. A new vaccine is created each year to protect against the changing flu viruses. Vaccinating women who are pregnant is often a priority because they will transfer protection to the developing baby, who cannot be vaccinated against the flu until at least 6 months of age.

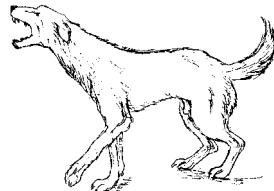
Usually 1 injection is given each year. Children 6 months to 5 years old are given 2 injections, 4 weeks apart, the first time they are vaccinated.

Typhoid fever

Typhoid is an infection causing fever, vomiting and other signs. It can be treated with antibiotics. Typhoid spreads from person to person through food or water. Handwashing and access to clean water and sanitation prevent it from spreading. The vaccine against typhoid comes in 2 forms: injection or tablets. The vaccine is used mostly when there is a typhoid outbreak and also for people traveling to where typhoid is common.

Rabies

Rabies is a deadly virus carried by animals, usually dogs or bats. Rabies is very rare in some countries and more common in others. Vaccinating all dogs against rabies lowers the risk to humans. If an animal with rabies bites someone, the person needs the rabies vaccine injection series starting right away and they also may need an injection of rabies immunoglobulin (see the chapter on First Aid, page 75). Washing the bite very well with soap and water for at least 15 minutes is important.



Using the rabies vaccine after an animal bite: When the person needs both rabies immunoglobulin and rabies vaccine, give the immunoglobulin first then use a different clean needle for the vaccine. Inject the complete vial of vaccine (either 0.5 ml or 1 ml depending on the vaccine manufacturer) into the upper arm muscle on the day of the bite, and then again on day 3 and day 7. Then, a fourth injection is given between day 14 (2 weeks) and day 28 (4 weeks) after the bite. For a child 2 years or younger, the injections are given in the upper thigh. Do not give rabies vaccine in the buttock.

Even if there is no rabies immunoglobulin available, washing the skin very well right away and giving the series of rabies vaccine can prevent rabies.

The rabies vaccine is given to prevent rabies before a person is bitten but usually this is only needed by people who work directly with animals that are likely to have rabies.

Health Workers: Key to Vaccinations

Health workers are the most important ingredient in any campaign to help children and adults get the vaccinations they need for everyone to stay healthy. Even if you are not the health worker giving the vaccination, people listen to your advice. As a member of the community, people trust you while they may not trust an outside visitor from a government vaccination program.

If you work in a health center or clinic:

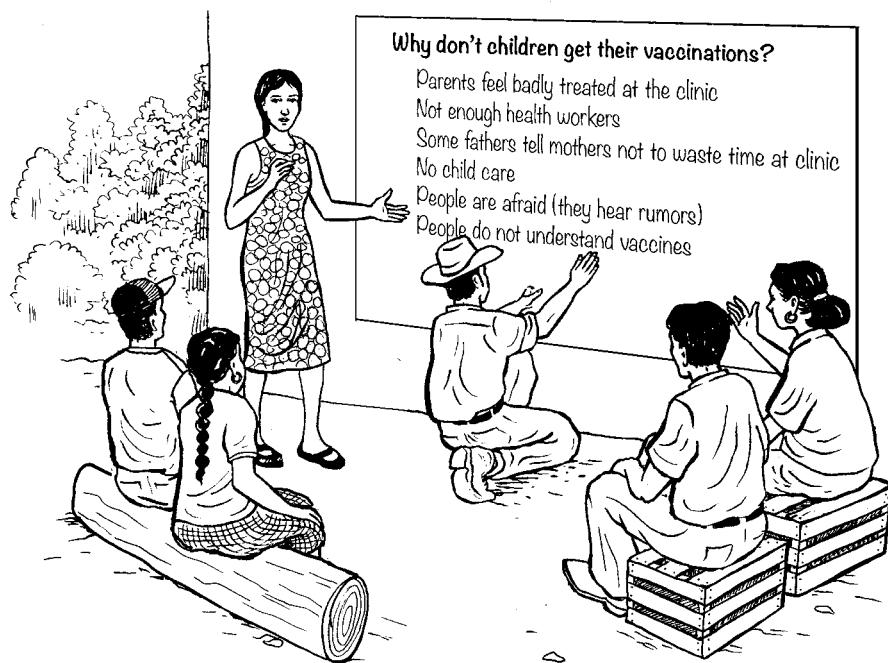
- Be friendly and welcoming to each parent. Let parents know that any question is a good question and they need not feel bad for asking.
- Because injections may hurt, do your best to make the experience better for the child. Maybe you can distract the child right after the injection with something that is brightly-colored or makes a sound.
- In a group or to each family explain each vaccination and why it is needed, before giving the vaccination. Describe if it normally causes a mild fever or ache in the arm so that parents won't worry. Explain what to do if parents notice any danger signs, such as an allergic reaction.
- If the clinic has run out of a needed vaccine, see if it is available in another clinic or make a plan with the family about when they can come back. You can write a reminder on their clinic or vaccination card.
- Help families keep vaccination records with a child health booklet or other method. This encourages people to plan and make decisions for their children's health.

Many health clinics do not get all the resources they need. If this causes people to have a bad experience in the clinic, they might not come back to get a vaccination. But even with too few workers or supplies, find ways to improve people's experience and make them feel good about visiting.

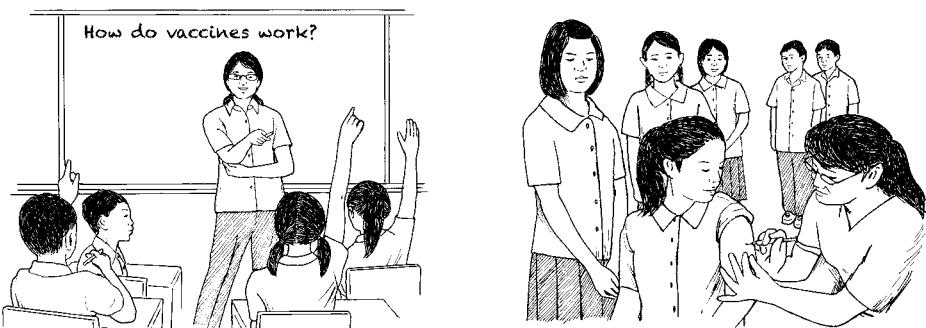


In the community, encourage families to get vaccinated:

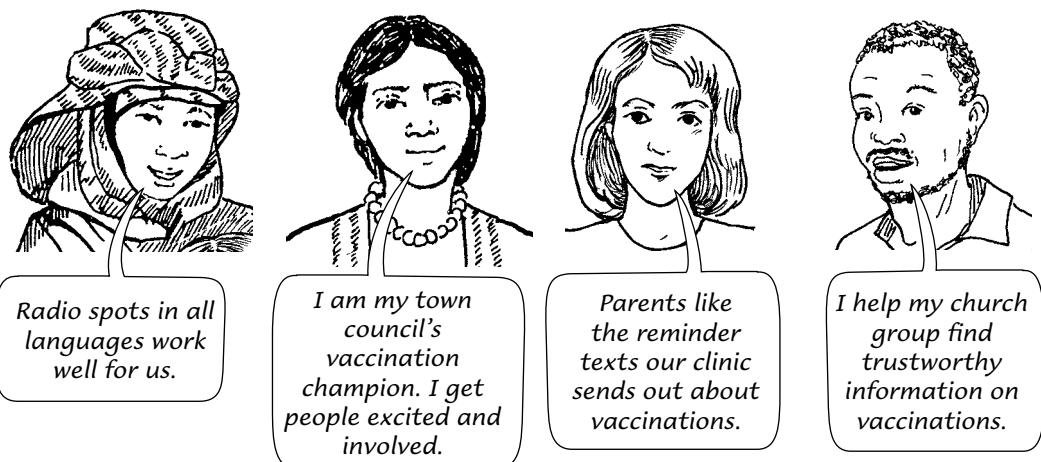
- Reach out to both mothers and fathers. Even though mothers usually bring the children to the clinic, when fathers also understand the importance of vaccines, children are more likely to get them. Maybe it will help to talk with grandparents or other family members too.
- If a family is avoiding vaccinations, find out why. Maybe it is a problem with transport, money, or something else you can help solve. Reassure them about the safety and value of vaccinations.
- Train and involve midwives or others who help pregnant women and new mothers so they can answer questions about vaccinations and help people get them.
- Involve children in promoting vaccinations. If children learn about it in school, they can talk to their parents about vaccinations for siblings, family members, and neighbors.
- Do what works in your community. Talking to people in their homes might help. Or you may find that parents like visiting the health center. Talking with teachers and religious or other leaders in the community can encourage more people to get vaccinated.



You know your community best. When organizing how to make sure all children get their vaccines, look at who you are trying to reach and what motivates them, what their concerns are, who makes which family decisions, and how to involve respected community leaders. Also find out if it is hard for people to get health advice and health services and what would make it easier.



Schools can teach young people about the importance of vaccines and the science of how they work. Vaccination programs can also reach children by offering vaccinations at school.



Public participation: A vaccination for equality

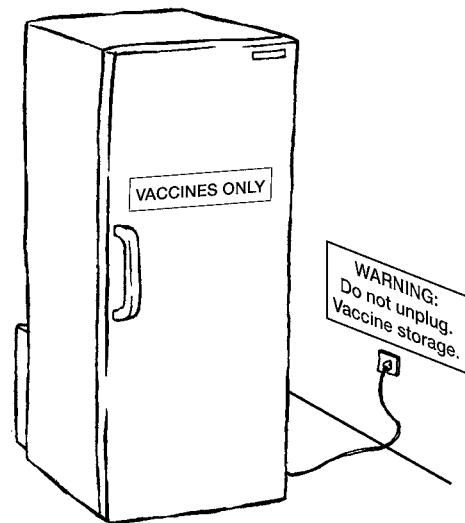
Vaccinations eliminate or reduce the spread of many sicknesses that previously caused death or serious health problems. But this is most true where vaccinations are free or inexpensive, and the health systems that deliver them work. That's why vaccinations are too important to leave to governments and pharmaceutical companies. Health workers, teachers, and other community leaders need to speak up to ensure vaccinations are always safe, given at no cost, and available to everyone who needs them, young and old. People need to pressure their governments to solve problems of unsafe water, lack of sanitation, poverty, discrimination, and lack of vaccinations—all of which cause poor health.

Vaccine Management

Keeping vaccines at the right temperature (maintaining the cold chain)

It is very important to keep vaccines at the right temperature. If certain vaccines get warm, they may spoil and not work. And some vaccines must stay cold but cannot be frozen or they will not work. Vaccines need to be kept at the correct temperature from the factory where they are made to the community where a health worker vaccinates the local children. If at any time from manufacturer to transport to storage the vaccine is too warm, or frozen when it shouldn't be, it becomes useless.

Refrigerator units are used to transport and store vaccines as well as the liquids used to dilute them. Learn which vaccines are stored at what temperatures and what shelf or compartment is used for each. In general,



vaccines are stored at a temperature that is under 8° C and slightly above freezing (2° C). See the box with lists of the vaccines that must not be allowed to get too warm and those which are frozen.

Some vaccines can spoil in bright light, including BCG and MMR. To protect them from sunlight and strong indoor lights, keep them in their dark glass vials and their extra packaging.

When a vaccine is made ready for use by mixing it with its diluting liquid, it must also be kept cool. People trained to handle the vaccines will know how many hours vaccines remain useful after mixing and if they need to be discarded at the end of the day.

Vaccines that can be frozen:

- Measles
- MR
- MMR
- BCG
- OPV (oral poliovirus)
- Yellow fever
- Japanese encephalitis

Vaccines kept very cold but DO NOT FREEZE:

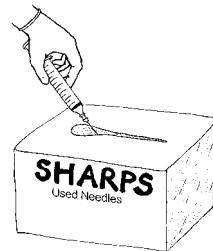
- Cholera
- Pentavalent
- Hepatitis B (Hep B)
- Hib (liquid)
- HPV (human papillomavirus)
- IPV (inactivated poliovirus)
- Influenza
- Pneumococcal
- Rotavirus (liquid and freeze-dried)
- Tetanus (DT, Td)

Learn how to store, prepare, and give vaccines

Everyone can promote vaccinations and many health workers learn how to give them too. If you are giving vaccinations or handling vaccines, your training will include:

- how to prepare the vaccines.
- how to determine the correct dose for different age groups.
- where to find expiration dates and how to dispose of expired vaccines.
- how to choose the correct needle size, angle of injection, and injection place on the body for each vaccine.

For your own health and the health of those you are helping, wash your hands before vaccinating each person. Use a needle one time only and then safely discard it.

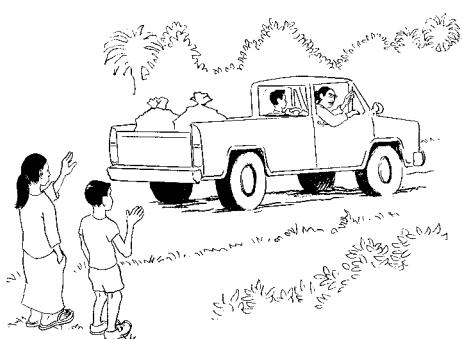


Take responsibility for vaccination waste

The last step of a vaccination campaign is often forgotten: properly disposing of the waste. The leftover plastics, needles, and biological materials create health problems for people and the environment, especially if they are burned or buried unsafely or left where children can pick them up.

An immunization program can plan to safely dispose of waste by:

- using the same vehicles that deliver the supplies to carry away waste for treatment and safe disposal.
- setting up regional waste treatment centers with burial pits.
- helping community clinics to set up simple health care waste disposal systems, including separation of wastes and safe burial pits. (See *Community Guide to Environmental Health*, Chapter 19: Health Care Waste.)



Good Food Makes Good Health



Food nourishes our bodies as well as our relationships. Food keeps our families and friends together, and our traditions alive.



Eating enough food and enough variety of nutritious food is essential to good health. Food gives our bodies energy and helps us learn and think well. Food protects us from infections and other health problems, allows our muscles and the organs inside our bodies to work properly, and makes our skin, hair and teeth beautiful and strong.

But not all foods make us healthier. The factory-made foods that many of us now depend on contain too much salt, fat, and sugar. These overly-processed foods can cause or increase health problems like heart attacks and diabetes.

Staying healthy depends on eating enough food and a variety of good foods.

Eating Enough

Everyone needs **enough** food. Eating enough gives the energy and strength our bodies and minds need each day.

Lack of food over weeks or months leads to serious and long-lasting health problems. Children, old people, sick people, people with HIV, and pregnant women suffer more (and more quickly) from a lack of food. So be sure there is enough for people who may have less ability to take care of themselves.

Children especially need enough food

More than anyone else, children need enough food every day. Lack of food in early childhood causes small size, sickness, and difficulty learning that lasts a lifetime.

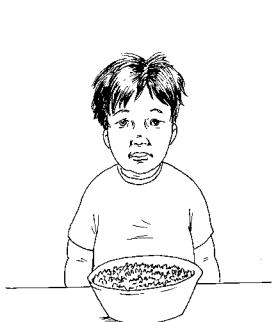
To ensure children get enough food:

- Give only breast milk and no other food or drink until the first teeth come in — about 6 months.
- Even when you start to give food at about 6 months, continue to breastfeed. The best is to breastfeed for 2 years or even longer. Giving breast milk **and** food ensures the child never lacks what she needs to grow and thrive.
- When you start to give food, offer a little bit a few times a day. Then increase to more foods, in greater amounts. A 2-year-old should eat at least 4 times a day. A baby who has stopped breastfeeding needs more meals than one who is still nursing.
- Give smaller children food in their own bowls. Then check that each child has eaten her share.
- Give girls just as much food as boys. Girls and boys need the same amount of food to be healthy and grow strong.
- Treat diarrhea right away with rehydration drink and other fluids (see page 22 in Belly Pain, Diarrhea, and Worms).
- Treat children with mebendazole when they have worms. If many children have worms, give mebendazole to all children in your community every 6 months to prevent infection (see page 34).

At different ages, children have different needs for food. See pages 1 to 3 in Caring for Children to learn more about feeding babies and children.

Eating a Variety

In much of the world, most people eat one main low-cost food with almost every meal. This main food provides energy to get through the day. But the main food alone is not enough to keep a person healthy. To grow, have strength and energy, and fight infection we must also eat other foods.

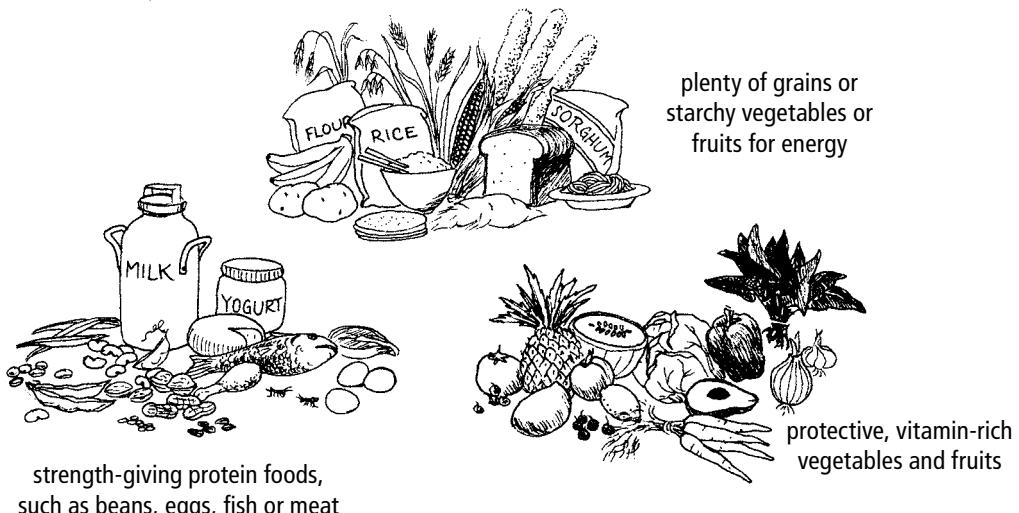


Plain porridge is not enough.



Add beans, meat, dairy, eggs, vegetables, or fruit.

For health, we need:



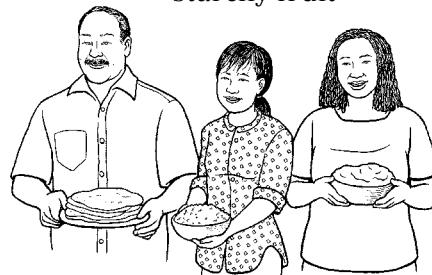
By eating a range of different healthy foods each day, we can prevent many serious health problems.

Starchy foods give us energy

Our main filling, starchy food gives our bodies most of the energy needed to work, and to care for ourselves and our families. Depending on where you live, the main food may be:

- rice
- maize
- wheat
- cassava
- breadfruit
- plantain
- potato
- yam
- millet
- or some other grain, root vegetable, or starchy fruit

These starchy foods are cooked into porridges, baked into tortillas and breads, pounded or ground into pastes, or cooked whole.



Choose local grains

If you have a choice of which starch to eat, local grains grow more easily, without the need for expensive chemical fertilizer, and are also the most nutritious choice. Corn, wheat, and rice are fine. But local grains like millet, buckwheat, and sorghum are even better because they have more protein, vitamins, and minerals.

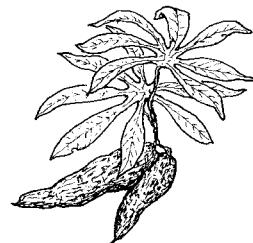
Rice and wheat

If you eat mostly wheat or rice, preparing it with the germ and bran layers still attached is healthiest. Whole wheat and brown rice are rich in nutrients but heavily milled white flour and white rice only provide energy.

Cassava (manioc, yucca)

Cassava root is a common main food that has plenty of energy, but few other nutrients. If you eat mainly cassava, it is especially important to add other foods like dried fish, vegetables, or beans. The leaves of the cassava plant are rich in vitamins and minerals and good to eat if cooked. Some types of cassava are bitter because they have a high level of cyanide (a poison).

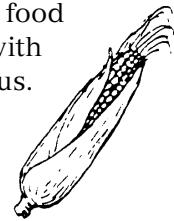
People make bitter cassava safe to eat by a process of pounding, grating, soaking, or fermenting that “cleans out” the poison.



Maize

If maize is your main starchy food, process it first with lime “cal,” to bring out its vitamins.

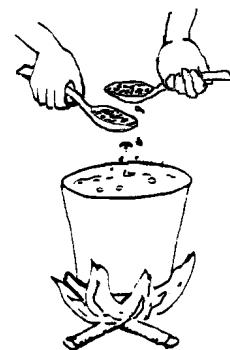
Maize comes from the Americas where it has been a main food for thousands of years. Traditionally, maize is processed with lime (cal) before it is cooked, which makes it more nutritious. When maize was brought to the rest of the world the tradition of cooking it with lime was left behind.



Unprocessed maize is fine if you also eat plenty of other protein and vitamin-rich foods. But maize has become a staple food in much of the world — sometimes it is the only food you can get. Without the traditional cooking process, eating only maize drains the body of an important vitamin called niacin and lacks the protein, iron, calcium, and other nutrients in processed maize. To process maize in the traditional way:

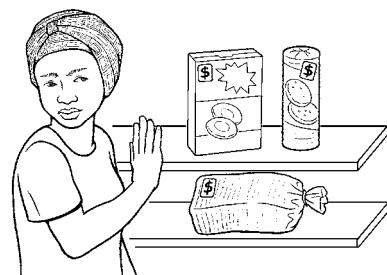


- Mix 2 spoons of lime (calcium hydroxide or calcium carbonate, both also called “cal,” not the lime fruit) into boiling water.
- Add ½ kilo dried maize.
- After the maize boils for a few minutes, take it off the heat and let it sit for a few hours. Then rinse the maize well, rubbing off the husks if you like. You can cook the maize whole or grind it to make dough or meal.



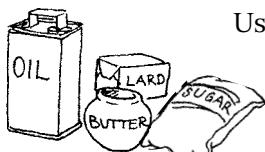
Factory breads and noodles are not as good

Packaged white breads, biscuits, and noodles lack the nutrition found in home-cooked main foods (like porridges and grains). And they often have too much fat, salt, and sugar.



Sugars and oils

Sugars and oils also give energy, and small amounts of these are needed for health. Be sure children get a little oil in each meal — especially if they eat mostly a main starchy food and little else.



Usually, factory-made foods contain much more sugar and fat than we need. People who rely on factory food get too much sugar and oil which causes a lot of health problems, see page 14.

Protein foods make us strong

Everyone needs protein foods for strength, to grow, and to recover from illness and injury.

Protein foods include:

- lentils, peas, beans, or other pulses.
- ground nuts, tree nuts, and seeds.
- eggs.
- any kind of meat that is available where you live: large or small animals, birds, fish, shellfish, or insects.
- milk, cheese, and yogurt.



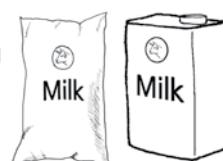
Whole grains without the bran or germ removed, such as brown rice and whole wheat, also contain some protein. So do many edible mushrooms.

You can be just as healthy eating beans, nuts, and other protein foods from plants as you can by eating meat. And plant proteins often cost less than meat to grow or buy.

We need to eat protein regularly. Pregnant women, children, old people, and those recovering from injury or illness need protein foods every day. Be sure to give some of these strength-giving foods to the people who need them most.



Some people cannot digest milk well. If you get stomach cramps from eating these foods, you may be lactose intolerant and should eat other proteins instead.



Vegetables and fruit protect our bodies

Try to eat fruits and vegetables every day. They contain different vitamins and minerals that:

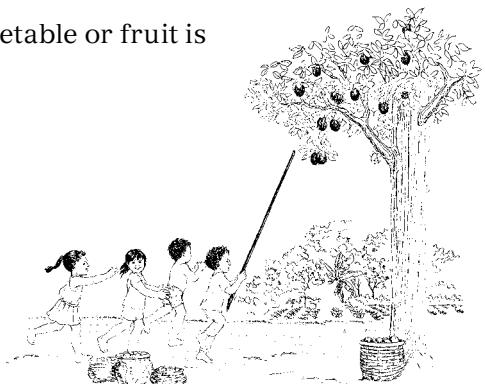
- protect the organs inside our bodies.
- keep our eyes, skin, teeth, and hair healthy.
- keep our digestion working well and help us to have normal stool.
- protect us from infection and disease.



*The fruits and vegetables that grow where you live
are as healthy as imported ones.
And they usually cost less or are free.*

Eat a variety of fruits and vegetables. Any vegetable or fruit is healthy, including:

- squash.
- melon.
- peppers and chilies.
- fresh peas and beans.
- berries, including edible wild berries.
- mango, papaya, guava, oranges, and other tree fruits.
- leafy greens — cultivated or edible wild greens are both good and so are the leaves of many root vegetables, including sweet potato, turnip, and taro.



A mix of different colored vegetables and fruits gives a better variety of vitamins and minerals.

Sprouting seeds and beans

Sprout seeds and beans to get more vitamins and minerals.

Soak a handful of beans, grains, or seeds overnight at the bottom of a bowl or jar of water.



The next day, rinse the seeds well through a sieve or clean cloth. Drain out all the water you can.

Rinse and drain them well once or twice each day so they do not dry out.

Soon, white sprouts will grow. In a few days, when tiny green leaves are visible, the sprouts are ready to eat raw or lightly cooked.



Problems from lack of variety of food

When we do not eat a variety of different kinds of food, then we do not get enough of the vitamins and minerals we need. This can lead to sickness.

Anemia and iron

Tiredness, weakness, and shortness of breath are commonly caused by anemia — a lack of iron in the blood.

Anemia is especially common in women, who lose iron from menstrual bleeding. Anemia can cause babies to be born small and can make bleeding during birth more dangerous.

A blood test for hemoglobin checks the amount of iron in the blood.

SIGNS OF ANEMIA

- pale gums and inner eyelids
- weakness
- tiredness
- dizziness
- trouble catching the breath



TREATMENT AND PREVENTION

Eat iron-rich foods:

- | | |
|--|--|
| <ul style="list-style-type: none"> • beans, peas, and lentils • greens and seaweed • dried fruits | <ul style="list-style-type: none"> • seeds and nuts • any kind of meat, including poultry, fish, shellfish, or small animals |
|--|--|



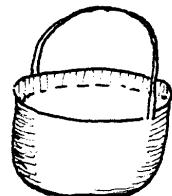
Organ meats like liver and heart, and foods made with blood are inexpensive and especially rich in iron.

Someone who is very pale, tired, or weak, or who has bled a lot may have severe anemia and needs to take iron pills (see page 39).

Foods rich in vitamin C allow our bodies to get much more iron from the foods we eat. So eat vitamin C rich foods in the same meals as iron-rich foods.



Vitamin C is found in green vegetables and most fruits, including tomatoes, oranges, papaya, mango, melons, and berries.



Cooking in iron pots adds iron to food.

Night blindness and vitamin A

Lack of vitamin A leads to not being able to see well in poor light (night blindness) and eventually complete blindness. Vitamin A is also needed for healthy skin and bones and for fighting infection. Children and women in particular often lack enough vitamin A.

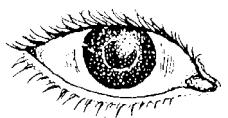
When you do not eat enough foods with vitamin A:



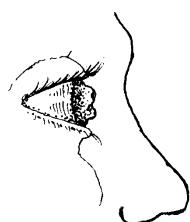
First, there is more difficulty seeing in dim light.



Later, the eyes become dry. The white of the eyes loses its shine and begins to wrinkle. Patches of little gray bubbles (Bitot's spots) may form.



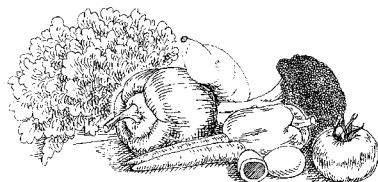
As the disease worsens, the cornea may become dull and pitted.



Then the cornea may quickly grow soft, bulge, or even burst. Usually there is not pain, but blindness can result.

Protect the eyes by eating any of these vitamin A rich foods that are available in your area:

- most **orange fruits and vegetables** — such as pumpkin, carrots, peppers, orange melons, papaya, mango, or orange sweet potato
- most **green vegetables** — such as leafy greens, green peas, and wild edible leaves
- liver
- eggs



If there are any signs of eye damage from lack of this vitamin, supplements of vitamin A (usually drops) should be given. Supplements can also be given out to children during vaccination campaigns or to prevent blindness during a measles outbreak (see page 37).

Goiter and iodine

A goiter is a swelling on the throat caused by a lack of iodine in the diet. A lack of iodine in the diet of a pregnant woman can cause deafness and other physical and mental disabilities in the baby. This can happen to the baby even if the mother does not have goiter.

The easiest way to prevent goiter and iodine deficiency is to use iodized salt (salt with iodine added when it is processed). This prevents most goiter and can make goiter go away. (An old, hard goiter can be removed only by surgery, but this is not usually necessary.) You can also eat foods that have iodine in them such as fish, shellfish, seaweeds, and other foods from the ocean. But in some mountainous areas, it is not possible to get enough iodine from food.

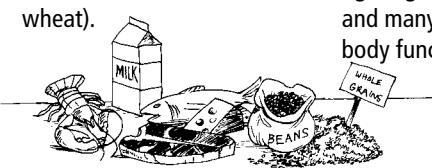
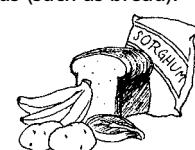


Iodized salt costs only a little more than other salt and is much better for your health.

If you cannot get iodized salt, you may need an iodine supplement (see page 38).

Other vitamins and minerals

We also need other vitamins and minerals, all of which we can usually get by eating a variety of foods. Getting vitamins regularly from food (not from tablets or tonics) is the best way for our bodies to use them. Some of the most important vitamins and minerals are listed in the chart on the next page.

Name of vitamin or mineral	What foods contain this nutrient	What it does for our bodies	Problems from not getting enough
ZINC	Meat, shellfish, beans, milk products, whole grains (like millet, brown rice, or whole wheat). 	Needed for growth, energy, fighting infection, and many other body functions.	Infections are more common. Children get more diarrhea, and take longer to recover from diarrhea.
B VITAMINS	Meat, fish, liver, eggs, whole grains, vegetables, and fermented and yeasted foods (such as bread). 	Helps our cells, nerves, muscles, and immune systems work.	When people have only one food to eat during times of severe hunger, this can lead to a severe B vitamin deficiency called pellagra – a disease of peeling skin, diarrhea, and mental confusion.
FOLIC ACID	Leafy greens, beans, peas, fruit, avocado, mushroom, liver. 	Needed especially by women before and during pregnancy for normal growth of a baby in the womb.	Babies born to mothers who do not get enough folic acid are more often born small or with birth defects (see page 3 in Pregnancy and Birth).
CALCIUM	Milk products, seaweed, dark green vegetables, nuts and seeds. Small fish with edible bones are a good source because bones are almost pure calcium. Finely ground eggshells are another source. 	Keeps bones and teeth strong. Helps muscles and nerves.	Weak bones that break easily.
FIBER	Beans, whole grains, vegetables and fruits, nuts and seeds. 	This is not a vitamin or mineral, but fiber helps keep digestion and bowel movements normal.	Constipation and stomach aches. Over many years, lack of fiber makes cancers and diseases of the intestine more common.

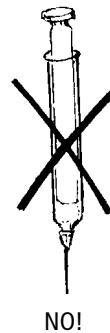
What about vitamin tablets and injections?

Some people think vitamin tablets, syrups, or injections will cure everything from tiredness to problems with sex. When both licensed doctors and so-called “injection doctors” promote vitamins as a cure-all this only worsens the problem—and empties your pockets!

Anyone who eats a good variety of foods, including vegetables and fruits, gets all the vitamins he needs. Save your money for fresh food—not expensive vitamin supplements.

Vitamin supplements are a kind of medicine. Like medicines, they should only be used when they are really needed. Vitamins are needed in cases of severe malnutrition, or during pregnancy when the demands on a woman’s body increase. Otherwise they are not needed and will not improve health or make children grow.

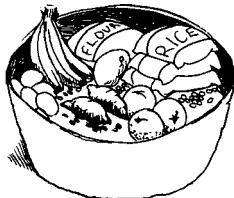
Avoid vitamin injections. They are needed only in the rarest cases of severe deficiency. And avoid re-used needles which spread germs that can lead to abscesses, hepatitis, and HIV.



Eating Well When You Have Little

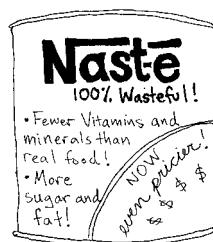
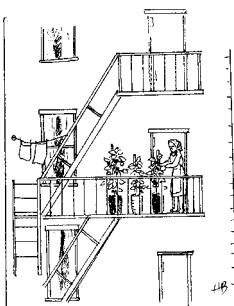
In a world where some people have land, resources, and money and others do not, there will always be hunger. And times of famine will continue as long as there are wars, outbreaks of disease, too much pollution, a lack of care for land, and economic policies that force people to move. These true, root causes of hunger must be changed to ensure that everyone is fed.

But one family or one community can usually eat better even when they have little. And perhaps by eating better, they can gain strength to stand up for social justice.



Ways to eat more and healthier foods

- Buy inexpensive simple foods like beans and grains. They are more nutritious and cost less than processed, factory-made foods such as white breads, biscuits, and tinned soups or snacks.
- If you live in a rural area, **gather or hunt traditional foods** like edible mushrooms, wild greens and berries, small animals, or insects. These tend to be very nutritious, and cost nothing.
- **Keep chickens for eggs and meat.**
Some people build small ponds to raise fish to eat.
- **Grow your own food in containers or a garden.**
- **Buy foods in bulk.** Single-serving packages are almost always more expensive than buying a larger amount that you use over a longer time. If you cannot afford the cost of a larger amount, perhaps you can buy with a neighbor or family member, and then share the cost.
- **Babies and young children need breast milk —** not formula. Breast milk is the best food for them and it costs nothing.
- **Avoid packaged cereals and flavored milks that are sold for older babies and children.** These are a waste of money. Regular animal milk, or well-cooked and mashed foods cost less and are healthier for children than packaged “baby food” or “baby milk.”
- **Do not throw away broth from cooking beans, meat, or vegetables.** This broth is full of nutrients and can prevent anemia. Drink it or use it to cook grains and other foods. Or cook with less water and put a lid on the pot – to keep the nutrients in.
- **Use the money you do have for food.** Alcohol, tobacco, and bottled or canned sweet drinks cost a lot of money over time and give no nutrition.



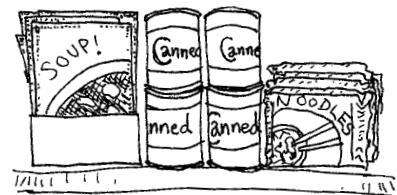
New Foods, New Problems

Factory-made foods such as packaged biscuits and snacks, colas and other sweet, bottled drinks are now available all over the world. These foods are very common in urban areas, and most rural people can get at least some of them. And most people have come to like their sweet or salty flavors. Often we like them so much we eat or drink them every day, and give them to our children instead of real food.

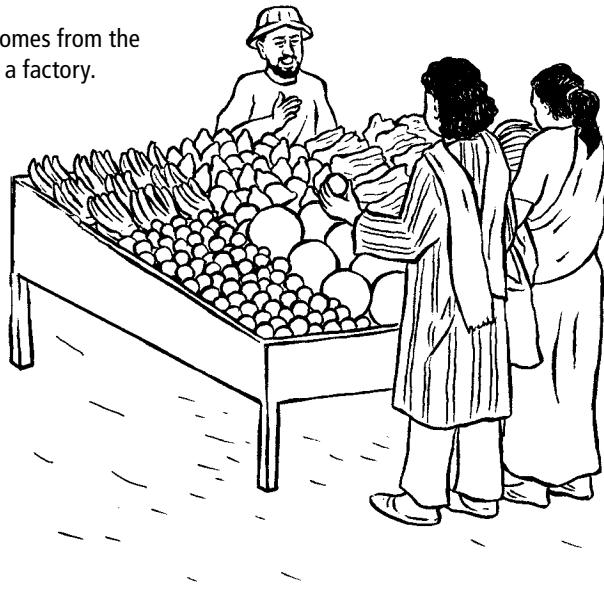


Candy, cola, and packaged snacks have too much salt, sugar, fat, chemical preservatives, and colorings. These unhealthy ingredients cause problems over time such as rotten teeth, diabetes, heart disease, and some cancers. These foods also lack the vitamins, minerals, fiber, and proteins of unprocessed, locally-made foods. For these reasons, they are called **junk foods**.

Factory-made white breads, canned foods, biscuits, and packaged crackers or noodles may seem as healthy as the fresh, home-cooked versions of these foods. Advertising tells us they are. But they are usually filled with too much unhealthy sugar, salt, and chemicals. And they lack the nutrients we get from home-cooked foods. They are also junk foods, just like candy and packaged snacks.



Healthy food comes from the earth, not a factory.



Diabetes and heart disease: diseases of the new food system

Diabetes and heart disease are health problems caused by the change in how people eat and work. They are rare where people still gather, grow, and cook their own food, and work as farmers or artisans. But as more people have less control of their work and get a limited amount of physical exercise (working in factories or in front of a computer, for example) and they rely more on factory-made foods, these diseases become more common. They are not caused by germs, nor are they contagious. They are caused by lack of activity, reliance on junk food, and increased stress and inequality in our lives. Our bodies do not work well in these conditions.



While diabetes and heart disease are very different diseases, they share many of the same causes. Each of these diseases can cause the other, and many of the ways to treat and prevent each disease are also the same.

Diabetes



Diabetes is a problem in which the body does not use sugars in food properly. It can lead to blindness, loss of limbs, coma, or even death. For more on the different types of diabetes and how to treat them, see the Diabetes chapter.

Diabetes has become extremely common in rich countries like the US, and is now growing more common all over the world. Its food-related causes include eating too much, eating unhealthy foods, and a lack of exercise. Wherever factory-made, white flour and high sugar foods take over, diabetes follows.

Heart disease and heart attacks

- High blood pressure
- Heart disease
- Heart attack

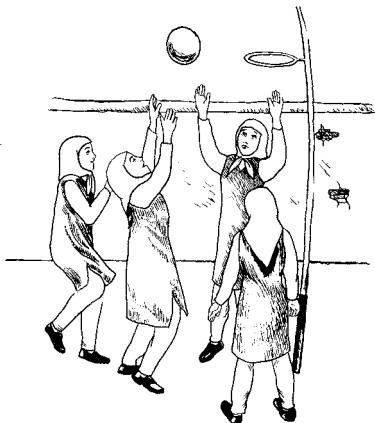
These are different parts of what is really one health problem: heart disease. Unhealthy food and a lack of exercise (along with smoking and stress) cause fat to build up inside the blood vessels. As a result, the heart must pump harder to force the blood through these thickened vessels causing high blood pressure. The heart grows tired and weak from all this effort. Blood which cannot flow freely clots up, and the heart, exhausted and without a flow of blood, stops working, causing a heart attack.

(Rheumatic heart disease is another common cause of heart disease. It comes from having had rheumatic fever as a child. See page 21 in Caring for Children.)

TREATMENT AND PREVENTION

There are many things we can do as individuals and in our families to prevent and treat diabetes and heart disease. But changes at a community and national level are also necessary.

Exercise: Fast walking, dancing, sports, or any exercise that speeds up your heart rate for 30 minutes or more a day is needed for every system in your body to function well. Exercise strengthens bones, gives a feeling of energy, improves mood, and helps you live longer. It is an essential way to prevent and treat both diabetes and heart disease.



Food: A diet with plenty of fresh vegetables, whole grains, and beans is best both for preventing and treating heart disease and diabetes.

- Red meats, dairy, and eggs are healthy foods, but if eaten in every meal or even every day they make heart disease more likely. So eat them a few times a week or less.
- Sweets and processed white starches are not needed at all, and eating them every day can lead to diabetes.
- Fat is needed in small amounts but leads to both heart disease and diabetes if eaten in large amounts. Red meat, palm oil, deep-fried food, and factory foods are the main unhealthy sources of fat. Try to eat less of these. Nuts, avocados, and fish are healthy sources of fat and provide other nutrients too, so are better choices.

- Salt can also worsen heart disease if eaten in large amounts. If you have heart disease or high blood pressure, avoid salty, packaged foods. Canned foods almost always contain too much salt. When flavoring your food, use only a little salt, or use herbs or spices instead.

Coke and other bottled and canned sweet drinks are particularly unhealthy. They are basically just water and sugar, with chemicals added for color and flavor. Drinking these every day can cause or worsen diabetes, rot the teeth, and fill you up with nothing good.



If you are fat: Losing weight protects you from both diabetes and heart disease. Losing weight gradually is safer than losing a lot of weight in a short time. The healthiest, most long-lasting way to lose weight is to exercise often (5 days a week or more) and to eat modest-sized meals. Try to avoid the unhealthy foods listed above.

Quitting smoking is another way to live longer and better. Quitting will protect you from heart disease, diabetes, and also from cancer. For more on the dangers of smoking, see Drugs, Alcohol, and Tobacco (in development).

Health is a community issue

What we eat and how we live our lives are partly results of our own choices, but they are also results of what foods, jobs, and housing are available and affordable. We can try to develop healthy eating and exercise habits, but our choices are often limited. For example, what we want to eat and if we have time to prepare good foods are the results of many things that are difficult for one person to control: advertising, how our work is organized, and whether we have access to clean water and a good kitchen. These conditions are shared by large numbers of people and can only be changed by collective action or through government policy.



Actions for change can have a narrow focus, such as banning Coke and sugary drinks from schools, or providing healthy school lunches to all students. Activities can be city-wide such as free daily exercise classes which are offered by the city of Bangkok, Thailand, or the Ciclovía story on the next page. National and local policies can be made to favor small farmers and local markets instead of policies that support profits for large agricultural companies. To successfully prevent and treat diabetes and heart disease, changes must be won on all these levels.

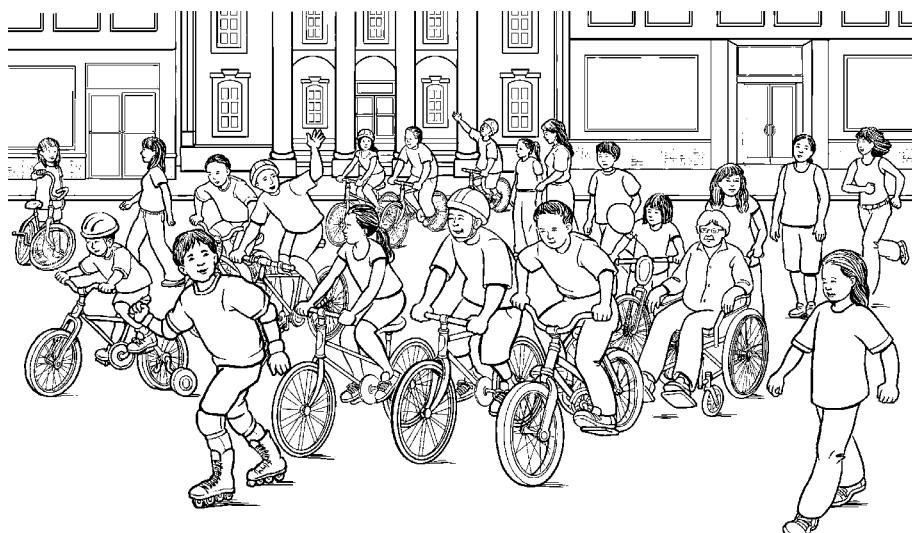
Ciclovía

The people of Bogota, Colombia (an enormous city in South America) were fed up with dangerous, crowded streets and polluted air. With leadership from a forward-thinking city official, they decided to do something about it: they would take back parts of their city from cars and trucks and make it more livable for people. The city got rid of hundreds of parking spots, built over 300 kilometers of paths for bicycles, and limited the number of cars allowed on the road during busy times.

Their most exciting invention (now copied in cities around the world) is **Ciclovía**: Every Sunday, the main streets are closed to cars. Bicycle riders, skaters, wheelchair riders, and walkers take over. In the parks, dance and exercise classes are offered for free. Bicycles are loaned at no cost.

Though organized to solve a serious problem, Ciclovía is fun. It is a weekly party to which everyone in the city is invited. Children and grandparents dance together in the parks and people of all ages bike, skate, and run through the normally traffic-clogged streets. It is a fun way to get exercise, meet neighbors and coworkers, and make new friends. It is a different and better way to live city life.

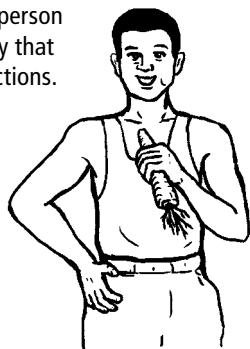
At first, some businesses were opposed to the idea because they thought it would create traffic jams and interfere with shopping. But Ciclovía was so popular that they stopped complaining. Now people in Bogota are looking for more ways to make their city safer, healthier, and more fun, 7 days a week.



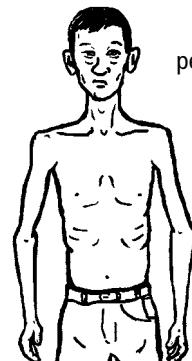
Eating When You Are Sick

Healing from most sicknesses does not require a special diet. Healthy food is the same whether you are sick or not.

A well-nourished person has a strong body that can fight off infections.



A malnourished person may get sick very often.



*When you are sick, do not avoid food.
Food will help make you well.*

HIV

People with HIV need to eat more than they did before they were sick to have enough energy to fight the infection. Eating more often each day is usually the most effective way to do this. Be sure to eat protein, vegetables, fruit, and fat, all of which are needed to stay strong and fight infection. Like everyone else, people with HIV also need to exercise. Even walking each day keeps your muscles working and your heart pumping well.

When you are sick with HIV, mouth sores, dry mouth, sore throat, nausea, or a lack of appetite can make eating feel impossible. See Care for Sick People (in development) for ideas about how to eat enough when you feel bad.

Unfortunately, there are no special foods that cure HIV. Only medicines can control the virus (see HIV and AIDS - in development).

Gallstones and gallbladder disease

Fried food and fat bring on gallbladder attacks. Boil, steam, or bake food instead of frying. Eat more fresh vegetables and fruits too (see page 14 in Belly Pain, Diarrhea, and Worms).

Diarrhea

Do not avoid food when you have diarrhea. Avoiding food does not make diarrhea go away; it can worsen malnutrition and dehydration (the real dangers of diarrhea). See page 25 in Belly Pain, Diarrhea, and Worms.



Keep germs out of your food

Making food safe by washing your hands and your food, keeping insects away, and storing food safely can protect you from stomach aches and diarrhea (see Water and Sanitation: Keys to Staying Healthy, pages 3 - 6)

Nausea or mouth pain

Care for Sick People (in development) suggests ideas for how to get nourishment when you feel too sick to eat.

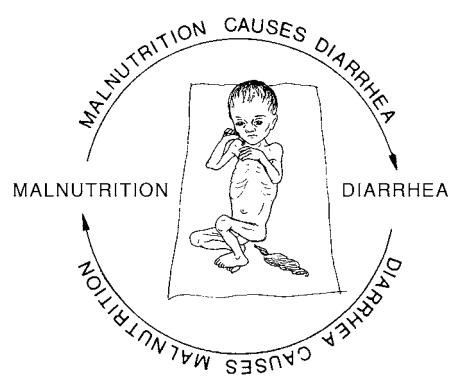
Malnutrition

SIGNS

- slow growth and small size
- thinness
- “wasting” of muscles: the body takes tissue from the muscles to supply energy
- slower thinking and lethargy, because the brain does not get the energy it needs
- more diseases and infections
- diarrhea happens frequently, making poor nutrition worse

Malnutrition is common and often chronic. This means many people are hungry for long periods, so they never grow as tall as they might, they get sick more often than they should, and they get more diarrhea, anemia, and other health problems more often.

In places where most children are malnourished, you may think a malnourished child looks normal. But small size, weakness, sad personality, and constant sickness are neither healthy nor normal.



TREATMENT

You can treat chronic malnutrition even when you do not have much, by giving more and better foods.

For babies from birth to about 6 months: give plenty of breast milk and nothing else. Any other food makes the problem worse. As the child grows, keep giving breast milk, and add other food too.

For everyone else with signs of malnutrition: give a high-energy porridge. Start by making a porridge with your main starchy food and add to it:

1. Protein: Groundnut flour, peanut butter or another nut or bean flour or paste.

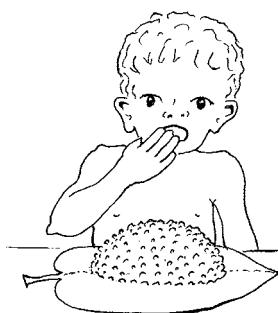
Or cooked beans, eggs, or fish. Or milk, yogurt, or cheese. Choose any protein that is affordable and available to you.

2. Energy: Add a spoon of oil and a spoon of sugar, honey, or another sweetener. Or add fruit.

3. Vitamins and minerals: From cooked vegetables or fruit.



There may be times when there is not enough food to give a child a healthy meal with protein and vegetables every day. Still, try to avoid giving only starchy food with nothing else. With only starch, the child will feel full but will grow weak and sick. **Add a spoon of oil.** A spoon of oil does not make up for a lack of protein and vegetables. But for a short time it can give energy that a child cannot get from starch alone.



To meet her energy needs, a child would need to eat this much boiled rice.



But when oil is mixed in, she only needs to eat this much.



Check all children for malnutrition

Chronic malnutrition in children often goes unnoticed. To check for malnutrition, weigh children regularly and keep track of their growth on a chart like the Road to Health Chart (see page 32 in Caring for Children). If you do not have a scale, another way to check for malnutrition is to measure the child's upper arm. Often there are programs or clinics for measuring the growth of children. These programs can be a good way to ensure a hungry child gets help early, before malnutrition becomes dangerous.

To measure the arm, cut a strip of paper, plastic, or cloth to about 25 cm.

← Mark on your strip the places that show when a child is too thin, or has enough fat and muscle. At 0 cm write, "measure from here," at 11.5 cm write "too thin," and at 12.5 cm write "growing well." Or use colors or symbols that make sense to you.

Use your strip to measure the upper arms of children between 1 and 5 years old, to make sure they are gaining enough weight.

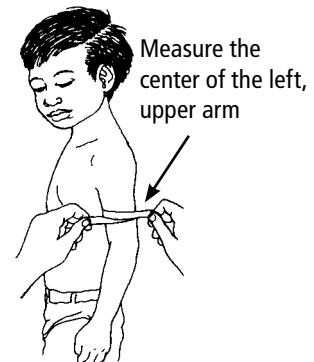
(Arm measurements are not useful when children have kwashiorkor, a kind of severe malnutrition that causes swelling in the arms and elsewhere, see page 23.)

When a child's arm measures less than 11.5 cm (below the "too thin" line), or she falls behind on the Road to Health chart, or has signs of acute malnutrition listed on the next page, she is so malnourished that malnutrition has become an illness in itself. She needs urgent treatment and you can help save this child's life by getting her high-energy food (see page 25).

Note: This picture may print at different sizes, so use a ruler to make sure your strip has the correct measurements.

← **YELLOW (in danger)**

If the child's arm measurement is here she is at risk for becoming malnourished. Give her extra food, monitor her growth, and watch her closely so that she does not become malnourished.

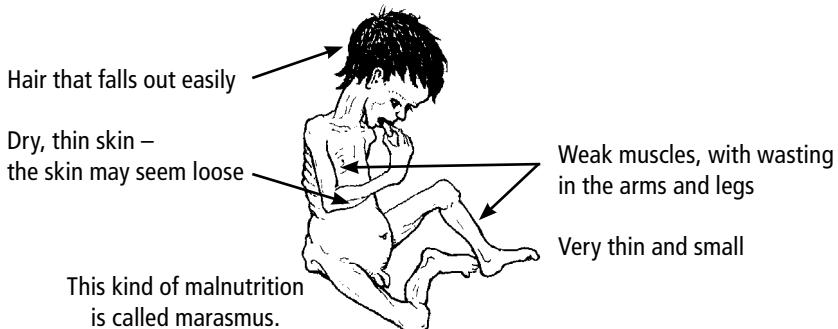


Severe, acute malnutrition

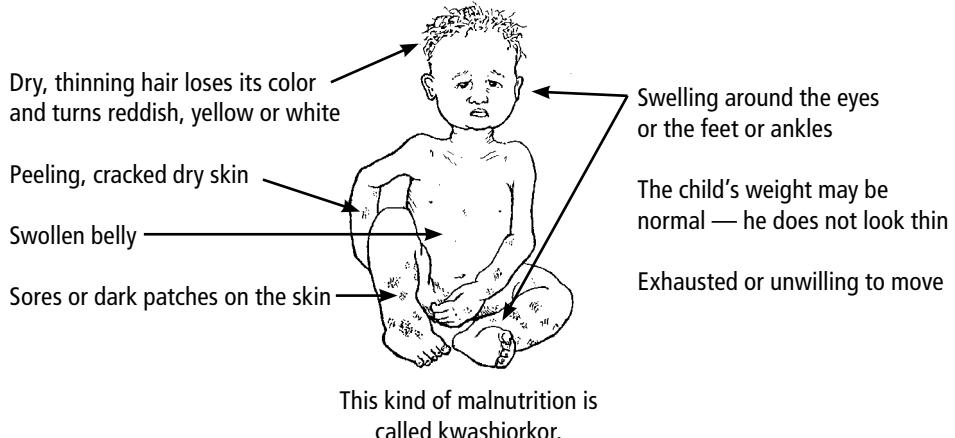
Severe, acute malnutrition happens in times of war, drought, or disaster when the food supply is interrupted. Or it can happen to someone who is poorly nourished most of the time, but something changes to decrease the food they eat or to increase the amount of energy they need. For example, when an already hungry child has a “growth spurt” and needs more energy. Or when a poorly nourished person gets HIV, malaria, leishmaniasis, measles, or some other sickness, and needs more food for energy to fight infection. Suddenly that “just enough” amount of food they were surviving on is no longer enough.

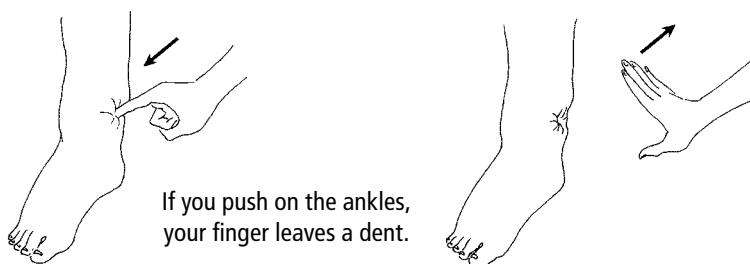
The information on malnutrition here is focused mainly on children because they suffer the most from it. They lose weight more quickly, and then lose their appetites, and must be given the most help to recover and survive. Without help, the damage caused by malnutrition can harm them throughout life. Adults get acute malnutrition too, and the treatment for adults is the same as for children.

A severely malnourished child may look like this:



Or a severely malnourished child might look like this:





Sometimes children show a combination of signs from both kinds of malnutrition.

People with HIV, TB, worms, or other long-lasting illnesses may be malnourished even when they eat regularly. If a child or adult eats plenty of food but still looks malnourished, they may have a serious illness. An important part of staying healthy with any long-lasting illness is to eat more food. But also try to identify the cause of the problem.



Ashika was severely malnourished when she came to the clinic.



After a few weeks, good food had cured her.

These two photos show the same 2 year old girl, Ashika. She came to the Nutritional Rehabilitation Home (NRH) in Kathmandu, Nepal with severe malnutrition. After 26 days of treatment with an enriched milk formula and a mixed diet of local foods, she gained enough weight to be healthy for her age, and went home with her mother. The NRH is not a hospital, just a big house with many beds, a vegetable garden, and a caring staff. They help around 20 children each month who suffer from severe malnutrition due to poverty, other illnesses, and lack of awareness about nutrition, as well as war and famine. Mothers also participate in their children's treatment. They learn about nutrition so they can help others when they return home. Feeding centers like these save the lives of most of the children brought to them.

Treatment for acute malnutrition

An acutely malnourished child needs medical help at once. If there is a feeding center in your area take the child there, or you may need to provide this care yourself. Give:

- food.
- drink (hydration).
- warmth, especially at night.
- medicines.

Food

Give highly concentrated food to quickly provide energy and nutrients. Plain starchy porridge is not enough.

You can make your own high-energy food at home. This homemade high-energy food is just as good as “therapeutic” foods such as *Plumpy’nut* and may be better in some ways (see page 29). It is also a great food for any older baby or young child, because all young children need concentrated energy and nutrients to grow and be well.

Combine 4 kinds of food using ingredients local to where you live: porridge, protein, fat or oil, and vegetable.

1. Make 1 cup porridge from a starchy energy food.

Choose any one of these:

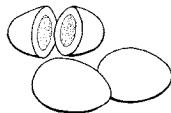
- millet
- maize
- rice
- wheat
- cassava
- yam or potato



Use whatever starchy food you usually make for your family, cooked into a thick paste (not a thin broth).

2. Add a high protein food.

Choose any one of these:



- | | |
|---|--|
| <ul style="list-style-type: none"> • 2 tablespoons milk powder • 1 egg • $\frac{1}{2}$ cup roasted, pounded or ground seeds or nuts | <ul style="list-style-type: none"> • $\frac{1}{2}$ cup cooked, mashed beans, lentils, or peas • $\frac{1}{2}$ cup cooked bean or pea flour • $\frac{1}{2}$ cup dried, pounded fish • $\frac{1}{4}$ cup cooked, finely chopped meats or organ meats |
|---|--|

3. Add 2 tablespoons fat or oil.

Choose any of these:

- one vegetable or nut oil, ghee, butter, or lard



4. Add $\frac{1}{2}$ cup cooked vegetable.

Choose any one of these:

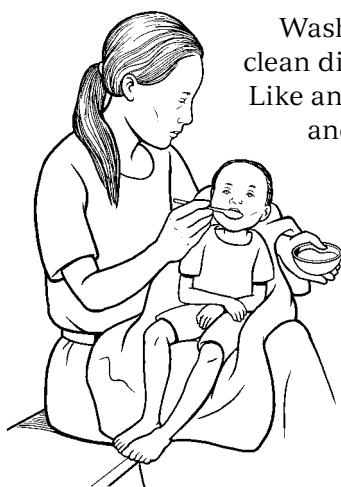
- | | |
|--------------------------|-----------------------|
| • tomato | • green beans |
| • green leafy vegetables | • fresh peas |
| • squash | • okra |
| • pumpkin | • any other vegetable |



Give this high-energy porridge 4 or 5 times a day.

A malnourished child may not want to eat or may have energy only to eat very slowly. Offer a little food every hour or two. **Be patient and persistent.** Keep feeding this high-energy food to the child until she begins to gain weight and gets her energy and spirit back.

Wash your hands before cooking or serving food, use clean dishes, and use all the food you prepare in a day or so. Like any food, this high-energy food will eventually spoil, and will spoil faster if you live where it is hot.



If the child is still nursing, **breastfeed first and then give this high-energy food.** Offer breast milk more often — because malnourished children may be too weak to nurse enough at each feed.

Also give fruit every day. Any fruit will give vitamins. But if you can, give different fruits on different days — so the child will get a variety of vitamins.

Fluids to drink (hydration)

Most malnourished children are also dehydrated from diarrhea. If a mother is breastfeeding, she should continue to give breast milk as often as she can.

Along with breast milk, give rehydration drink. A child with severe malnutrition needs **less salt** and a bit more sugar than is in the usual recipe for rehydration drink. So:



- In 1 liter clean water



- Mix 1/4 teaspoon salt

Taste this mixture. It should be less salty than tears.



- Then mix in 9 teaspoons sugar

Give spoonfuls of this mixture every few minutes.

A malnourished person may not even have enough energy to drink. Support her head while you spoon the drink into her mouth.

Warmth

With severe malnutrition, the body does not have the energy to warm itself enough. Check the person's temperature regularly. Warm her with blankets for several days, until she starts to recover. People get coldest at night, so she needs extra blankets then.

Medicines

Severe malnutrition is an illness and requires medicines. A severely malnourished child is likely to have infections. But her body is so weak, it may not be able to show the signs that usually tell us when someone is sick. For this reason, give medicines to fight infection, even if she has no fever or obvious infections.

Give acutely malnourished children:

- amoxicillin or another antibiotic, 3 times a day for 7 days (see page 41).
- measles vaccine (unless you are sure the child is already fully vaccinated against measles), see Vaccines (in development).
- vitamin A supplements, see page 37.
- zinc supplements, see page 40.
- mebendazole (if worm infections are common where you live), see page 34.



Watch the child carefully

A malnourished child can quickly get much worse, and needs careful attention.

As you start giving fluids and food, check her heart and breathing rate (see Examining a Sick Person - in development). If these increase as you give rehydration drink, stop giving it and get medical help. Her heart may be having trouble adjusting to the fluid.



Is the child getting better? If she does not improve after a few days, she may have an infection or illness causing more problems. You probably need to go to a hospital. Also get help if at any time the child becomes unconscious (passes out), has a seizure, or has a fever, 38°C (100.4°F) or higher.

Help the child's main caregiver understand exactly what this child needs to survive and get better. Clearly explain about rehydration, food, and any needed medicines as well as how to help the child eat more in the future. Remind the caregiver to be patient and persistent while feeding the child. Without attention to the child's food and care, she can quickly slip back into

being malnourished. Ask the caregiver to explain the care instructions back to you, so you are sure they understand. And do what you can to help. Usually the care for a malnourished child is in the hands of a mother who is already busy watching other children and doing household work, and who lacks enough food herself. Helping the mother will help the child.



No matter how well she recovers, a child who has had severe malnutrition needs to be checked regularly to be sure her mind and body are growing and strong.

Ready-to-Use Therapeutic Foods

When people are starving, you may be able to get packaged, “Ready-to-Use Therapeutic Foods” (RUTF). These high-energy foods can be life-saving when you have nothing else, for instance, in refugee camps. But they have their problems. Dr. Massimo Serventi, a pediatrician in Tanzania, wrote to us about his concerns about *Plumpy’nut*, the best known RUTF:



Big institutions advocate the use of Plumpy’nut because they aim to save lives of children. Yes, today, but what about tomorrow? And the day after tomorrow?

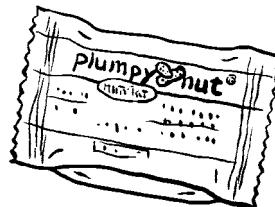
If Plumpy’nut is effective and good, why is it manufactured in France and not in Nairobi? Or Harare? Or Mumbai?

Enriched flours containing groundnuts have been sold in African shops for years. Why not encourage these healthy, local enriched flours instead of importing Plumpy’nut?

Children like the sweetness of Plumpy’nut so much that they refuse to accept other ordinary foodstuffs.

In areas of conflict or crisis (like here) you can find Plumpy’nut sold in the local markets. Doctors, nurses, and nutritionists have all become relaxed in offering Plumpy’nut.

What do mothers think about Plumpy’nut? I suspect they perceive it as a drug, or even worse as “wazungu chakula” (white men food) that is superior to their own food. A tragedy. In Sudan people cook with a nutritious paste of groundnuts (dakua), but they do not give it to children. Dakua could help save hungry children, but instead, they give Plumpy’nut!



(After being challenged by Médecins Sans Frontières, the company that makes *Plumpy’nut* did agree to allow local companies to make products using the *Plumpy’nut* recipe.)

Preventing Hunger

Within your own community, you can help prepare for food emergencies by growing food, storing it well, and sharing with neighbors.

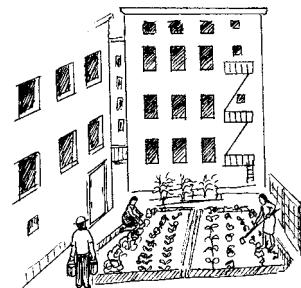
Growing food

Wherever you live, you can grow food. Growing your own food is one of the best ways to eat healthy, and gives you something to eat when there is no money to buy food.

City-dwellers grow food on rooftops, in vacant lots, in pots or sacks of soil in a window. A few plants in a pot may not provide you with much food but it is a way to start. Children love helping with growing things and caring for plants is a valuable skill to teach them. Join with neighbors to plant a garden in an empty lot and you can grow even more.

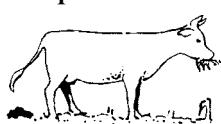
If you farm already, but mostly grow cash crops like cotton, coffee, rice, or coca, also plant some vegetables for your family or village. Or build a small fish pond. If your cash crop fails or the price drops, you will still have something to eat.

For more ideas on how to grow your own food, see Hesperian's *A Community Guide to Environmental Health*, chapters 12 to 15.



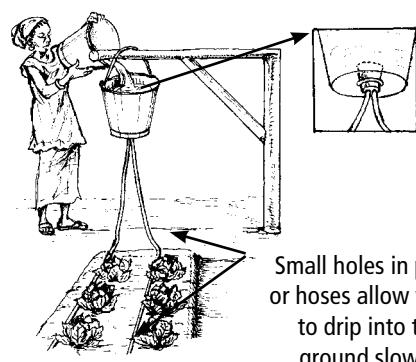
Improve your yield

- **Improve soil with animal manures and compost.** Commercial or chemical fertilizers increase yield for a few years, then leave the soil weakened and water sources poisoned. Natural fertilizers like manure or compost improve the quality of the soil over the long term.



For a small kitchen garden, save your food waste in a bin where it can rot back into soil, and use that compost to enrich the soil.

- **Use your water carefully.** Try collecting rainwater. If you can get a long pipe or hose, make a line of small holes to irrigate each plant instead of wasting water in large irrigation ditches.



Small holes in pipes or hoses allow water to drip into the ground slowly.

- **Rotate crops** to prevent disease and strengthen the soil.
- **Grow peas or beans.** They are nutritious foods and strengthen the soil as they grow.
- **Avoid pesticides.** Pesticides are poison. They kill pests and help crops for a short time, but they also harm the people who handle and use them. Birds and small animals that eat insects may also become sick. Without these predators, more pests survive to damage crops. Over time, insects get stronger and survive even strong poisons. These expensive chemicals are dangerous and should be avoided when possible.

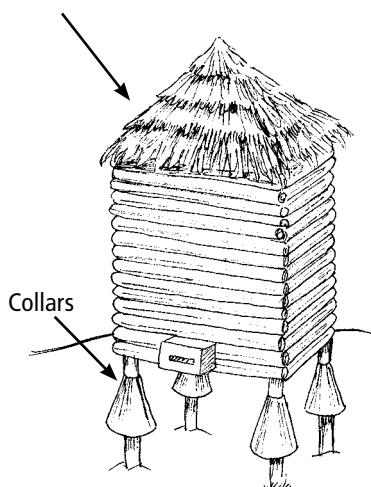
Spraying plants with a mild soap can keep pests under control without strong poisons. Even vegetable oil kills many insects.

Store the food you grow

Growing food does no good if the food goes bad or is eaten by pests. Drying, pickling, salting, and fermenting are traditional ways to keep food safe to eat after the growing season ends.

For grains and beans

- Dry and store grains soon after harvest. (Leaving grain in the field leads to a lot of lost grain.)
- Store grain somewhere dry, **off the ground**, and in containers that can be closed tightly. For a large harvest you can build a raised shed, like this. Smaller amounts can be sealed in barrels or other closed containers.



Clear the area of weeds and other cover. Rodents are attracted to food waste, and to protected dark areas where they can nest. Remove these from the area.

Keep storage containers well sealed and repair any holes quickly. **Rodents can squeeze through very small holes.**

Keep grain storage containers high off the ground.

Rodents can climb. Clear away anything touching the storage container and put collars around its legs.

Keep dogs or cats to scare rodents away.



This year maize.



Next year beans.

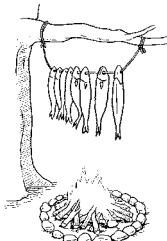


If you have a sprayer, clean it well, then put some vegetable oil and water inside. Shake before you spray to kill aphids and other insects.

- In parts of India, farmers mix neem leaves in with stored grain. Neem is a natural and safe pesticide and keeps insects away. In Cameroon, farmers tightly pack dried cowpeas and wood ash in clay jars for storage. The ash keeps out weevils. In other places, dried beans are stored in oil. These are all excellent, safe ways to store grain and beans and protect your food for later use.
- Moldy grain should be destroyed. The mold contains toxins.

Drying

Dried fish, fruit, meat, and vegetables can provide vitamins, minerals, and protein in times when you cannot grow or produce food. Dry foods more quickly and with less dust by keeping them off the ground. A shallow, loose-weave basket, chicken wire, or some kind of framed screen allows air to pass underneath, drying the food more quickly. Cover drying foods with a thin cloth or another screen to keep off pests and dirt.

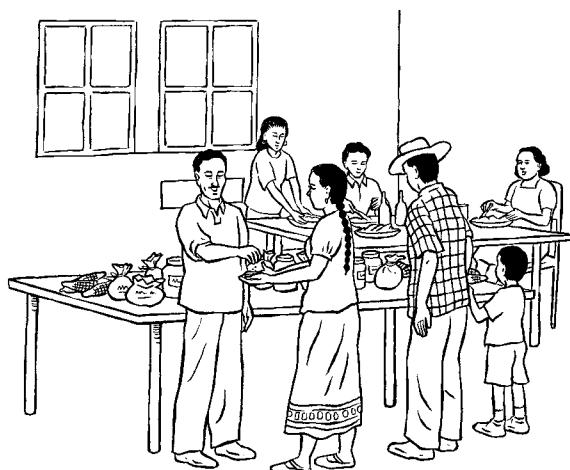


Vegetables should usually be lightly cooked before drying. Dry vegetables and fruit until they are mostly dry, but still contain enough moisture to be tasty. Meat and fish can dry over a fire.

Keep dried foods somewhere dark and cool, in closed bags or containers.

Share with your neighbors

Some communities have a tradition of sharing food with those who need it. For example, when families go to religious services, they bring a handful of grain to share. Small amounts of grain from many families add up to a lot of stored grain. Then, if a few families' crops fail, the stored grain is given to those struggling families. Some groups have set up formal "rice banks" where families leave rice during the harvest season to loan to people in need during the dry season.



Local solutions to community-wide hunger

The city of Belo Horizonte in Brazil is working to stop hunger and poverty for its citizens and for food growers who live nearby. In the 1990s, the local government declared food to be a human right, and started new programs to support this right. For example:

- Healthy meals are provided to school children.
- Poor people can receive a basket of basic, nutritious foods each week.
- Three large neighborhood restaurants serve simple, nutritious meals at low cost. Regular customers can suggest improvements to these restaurants.
- The city buys fruits and vegetables for their food programs directly from small farmers who live near the city. It also established farmers markets where farmers can sell their produce at fair prices. This keeps small farmers on their land, so they do not have to move to the city. It also ensures an adequate supply of fresh fruit and vegetables for people who live in the city.
- The prices of basic foods at dozens of markets are tracked. Then these prices are posted in public places and on television and radio so people know where to get the best price, and private markets are forced to keep their prices fair.



These programs have quickly and greatly improved the health of the people of Belo Horizonte. The number of infant deaths was reduced by half since these programs began.

Good Food Makes Good Health: Medicines

Medicines for Worms

Medicines by themselves are not enough to get rid of worm infections for very long. Personal and public cleanliness is also necessary. Worm infections can spread easily among family members, so when one person has worms it is wise to treat the whole family too.

Mebendazole

Mebendazole works against hookworm, whipworm, roundworm, and pinworm (threadworm). It may do some good against trichinosis, but is not the best medicine for this. Although side effects are not common, there may be some gut pain or diarrhea if the person is infected with a lot of worms.

Important

Avoid mebendazole during the first 3 months of pregnancy when it can harm the developing baby. Do not give to children under 1 year old.

How to use

For pinworm

→ **1 year to adult:** give 100 mg, one time by mouth. Repeat in 2 weeks if necessary.

For roundworm (Ascaris), **whipworm** (Trichuris) and **hookworm**

→ **1 year to adult:** give 100 mg, 2 times a day for 3 days (6 tablets in all). **OR**
give one 500 mg tablet, one time only.

To prevent roundworm where this infection is common

→ **1 year to adult:** give 500 mg, every 3 to 6 months.

For trichinosis

→ **1 year to adult:** give 200 to 400 mg, 3 times a day for 3 days. Then give 400 to 500 mg, 3 times a day for another 10 days. If there are pain or vision problems, also give a steroid, for example prednisolone, 40 to 60 mg, once a day for 10 to 15 days.

Albendazole

Albendazole is similar to mebendazole but often more expensive. It works against hookworm, whipworm, roundworm, pinworm, and trichinosis. Side effects are rare.

Important

Avoid albendazole during the first 3 months of pregnancy when it can harm the developing baby. Do not give to children under 1 year old.

How to use

For pinworm, roundworm (Ascaris), **whipworm** (Trichuris), and **hookworm**

- **1 to 2 years:** give 200 mg, one time.
- Over 2 years:** give 400 mg, one time. Repeat in 2 weeks if needed.

For trichinosis

- Give 400 mg, 2 times a day for 8 to 14 days. If there are pain or vision problems, also give a steroid, for example prednisolone, 40 to 60 mg, once a day for 10 to 15 days.

Pyrantel pamoate, pyrantel embonate

Pyrantel works for pinworm, hookworm, and roundworm (Ascaris), but it may be expensive. It occasionally causes vomiting, dizziness, or headache. Do not give it to someone also taking piperazine (another anti-worm medicine).

How to use

For hookworm and roundworm: give one dose only.

For pinworm: give one dose, wait 2 weeks, then give another dose.

- Give 10 mg per kg. If you cannot weigh the person, dose by age:
- Under 2 years:** give 62 mg ($\frac{1}{4}$ of a 250 mg tablet).
- 2 to 5 years:** give 125 mg ($\frac{1}{2}$ of a 250 mg tablet).
- 6 to 9 years:** give 250 mg (one 250 mg tablet).
- 10 to 14 years:** give 500 mg (two 250 mg tablets).
- Over 14 years:** give 750 mg (three 250 mg tablets).

For Tapeworm

There are several types of tapeworm. Praziquantel or niclosamide both work for all types. If the tapeworm infection is in the brain or causes seizures, the person needs albendazole and anti-seizure medicines instead, and should get help.

Praziquantel

Side effects



Praziquantel may cause tiredness, dizziness, headache, loss of appetite, and nausea, but these side effects are rare at the low doses used to treat tapeworm.

How to use



For most kinds of tapeworm, including beef and pork tapeworm

- Use 5 to 10 mg per kg, one time only. Or dose by age:
 - 4 to 7 years:** give 150 mg ($\frac{1}{4}$ tablet), one time only.
 - 8 to 12 years:** give 300 mg, one time only.
 - Over 12 years:** give 600 mg, one time only.

For dwarf tapeworm (H. nana)

- Use 25 mg per kg in one dose. Then repeat in 10 days. Or dose by age:
 - 4 to 7 years:** give 300 to 600 mg ($\frac{1}{2}$ to 1 tablet) per dose.
 - 8 to 12 years:** give 600 to 1200 mg per dose.
 - Over 12 years:** give 1500 mg per dose.

Niclosamide

Niclosamide works against tapeworm in the gut, but not against cysts outside the gut.

How to use



Take niclosamide after a small morning meal. Tablets must be chewed well and swallowed. The dose may differ depending on the type of tapeworm, so your local health authority may have a good recommendation. If not, use the dose below.

Chew well and swallow the following doses. If a small child cannot yet chew, crush the tablet and mix with a little breast milk or food.

- **Under 2 years:** give 500 mg, one time only.
- 2 to 6 years:** give 1 gram (1000 mg), one time only.
- Over 6 years:** give 2 grams, one time only.

Vitamin and Mineral Supplements

Mixed (or multi) vitamins

Nutritious food is the best source of vitamins. But when adequate food is not available, or during pregnancy when women have a greater need for nutrition, a mixed vitamin supplement should be used.

Vitamin and mineral supplements come in many forms, but tablets are least expensive. Injections of mixed vitamins are unnecessary, a waste of money, and can cause unnecessary pain and infections. Tonics and elixirs often do not include the most necessary vitamins and are usually too expensive for the little good they do.

How to use

Many mixed vitamin tablets use 1 tablet daily, but read the label for instructions.

Vitamin A, retinol

Vitamin A prevents night blindness and xerophthalmia.

To get enough vitamin A, people need to eat enough yellow fruits and vegetables, dark green leafy vegetables, and foods such as eggs, fish, and liver. In areas where night blindness and xerophthalmia are common and eating enough of these foods is not always possible, give children vitamin A every 6 months.

Important

Do not use more than the suggested amount. Too much vitamin A from capsules, tablets, or oil can be dangerous. Do not give the regular adult dose of 200,000 U to girls or women who could become pregnant, or women in the first 3 months of pregnancy because this can harm a developing baby. For pregnant women, vitamin A is given in smaller doses more often instead of a single large dose.

How to use

Swallow pills or capsules. But for young children, crush tablets and mix them with a little breast milk. Or cut open capsules and squeeze the liquid into the child's mouth.

To prevent vitamin A deficiency in children

As part of a prevention program:

→ **6 months to 1 year:** give 100,000 U by mouth one time.

Over 1 year: give 200,000 U by mouth one time. Repeat every 6 months

To treat night blindness

If someone already has difficulty seeing or has other signs of night blindness, 3 doses are given. The first dose is given right away, the second is given one day later and the third dose at least 2 weeks later.

- For each of the 3 doses:

Under 6 months: give 50,000 U by mouth in each dose.

6 months to 1 year: give 100,000 U by mouth in each dose.

Over 1 year: give 200,000 U by mouth in each dose.

- **For pregnant women:** give 25,000 U by mouth weekly in pregnancy for 12 weeks. If she has continued signs of night blindness or another severe eye problem from lack of vitamin A, an experienced health worker may give a pregnant woman a larger dose.

For children with measles

Vitamin A can help prevent pneumonia and blindness – two common complications of measles.

- **Under 6 months:** give 50,000 U by mouth 1 time a day for 2 days.

6 months to 1 year: give 100,000 U by mouth 1 time a day for 2 days.

Over 1 year: give 200,000 U by mouth 1 time a day for 2 days.

If the child has already received a dose of vitamin A in the last 6 months, give this treatment for one day only. If someone with measles is severely malnourished or already starting to lose her vision, give a third dose of vitamin A after 2 weeks.

Vitamin B6, pyridoxine

Persons with tuberculosis being treated with isoniazid (INH) sometimes develop a lack of vitamin B6. Signs of vitamin B6 deficiency include: pain or tingling in the hands or feet, muscle twitching, nervousness, and sleep problems.

How to use

Give vitamin B6 every day the person is taking isoniazid.

To PREVENT vitamin B6 deficiency

- **Babies and small children:** give 10 mg each day.
- Larger children and adults:** give 25 mg each day.

To TREAT vitamin B6 deficiency

- **Newborn to 2 months:** give 10 mg once a day for as long as there are any signs of deficiency.
- Children older than 2 months:** give 10 to 20 mg, 3 times a day for as long as there are any signs of deficiency.
- Adults:** give 50 mg, 3 times a day for as long as there are any signs of deficiency.

Iodine

Iodized salt and seafood are the best ways to get enough iodine. Where it is impossible to get these, and where there is goiter or hypothyroidism (cretinism), you can give iodine supplements.

How to use



With capsules:

- **Newborn to 1 year:** give 100 mg once a year.

If you have a 200 mg capsule, cut it open and squeeze the contents into a small cup, and do your best to feed the baby ½ of this liquid. It is OK to not be exact, but do not give the entire contents to a small baby.

1 to 5 years: give 200 mg once a year.

6 years to adult: give 400 mg once a year.

For pregnant women, to protect them from goiter and their babies from disabilities: give 400 mg one time during pregnancy. As early in pregnancy as possible is best, but any time is OK.

With iodized oil:

- **1 to 5 years:** give 0.5 ml (240 mg) once a year.

6 years to adult: give 0.5 to 1 ml (480 mg) once a year.

Pregnant women: give 1 ml (480 mg) one time as early in pregnancy as possible.

Repeat 1 year after giving birth.

Iron, ferrous sulfate, ferrous gluconate

Ferrous sulfate is useful in the treatment or prevention of most cases of anemia.

Treatment with ferrous sulfate by mouth usually takes at least 3 months.

Iron works better when taken with vitamin C (either by eating fruits and vegetables, or taking a vitamin C tablet).

Side effects



Iron sometimes upsets the stomach and is best taken with meals. Also, it can cause constipation especially in older people, and it may make the stools (feces) look black. See advice for constipation on page 37 in Belly Pain, Diarrhea, and Worms.

Drinking liquid iron supplements blackens the teeth. Drink it through a straw or brush the teeth afterwards.

DOSE BY AGE FOR FERROUS SULFATE

AGE GROUP	HOW MUCH PER DOSE	HOW MANY 300 MG TABLETS	HOW MUCH TOTAL IRON
Under 2 years	→ 125 mg ferrous sulfate	→ Use iron syrup, or crush about ¼ of a 300 mg ferrous sulfate tablet in breast milk	→ Give enough to provide 25 mg iron
2 to 12 years old	→ 300 mg ferrous sulfate	→ 1 tablet of 300 mg ferrous sulfate	→ Give enough to provide 60 mg iron
12 years to adult	→ 600 mg ferrous sulfate	→ 2 tablets of 300 mg ferrous sulfate	→ Give enough to provide 120 mg iron

Important

Be sure the dose is right. Too much ferrous sulfate is poisonous. Do not give iron to severely malnourished persons. Wait until they have recovered their health.

How to use

Different forms of iron contain different concentrations of this mineral. For example, a 300 mg tablet of ferrous sulfate contains about 60 mg of iron. But a 325 mg tablet of ferrous glucanate contains 36 mg of iron. So read the label of your tablets, syrup, or other iron supplement to learn the iron content.

To PREVENT anemia in pregnant and breastfeeding women

- Give 300 mg ferrous sulfate (60 mg iron) each day. It should also be taken daily by pregnant women and women who plan to become pregnant. A combined iron and folic acid supplement is even better because folic acid helps prevent birth defects.

To TREAT someone who is already anemic

- Give ferrous sulfate once a day, or divide into 2 doses if it upsets the stomach.

Zinc

Zinc helps a person with diarrhea to get better faster. It should be given along with rehydration drink. See page 27.

How to use

For babies, tablets can be ground up and mixed with breast milk or a little water. You may be able to get a "dispersible tablet" which dissolves quickly and easily in liquid.

- **Newborn to 6 months:** give 10 mg, once a day for 10 to 14 days.
- Over 6 months: give 20 mg, once a day for 10 to 14 days.

Antibiotics Fight Infection

Cotrimoxazole, sulfamethoxazole with trimethoprim, TMP-SMX

Cotrimoxazole, a combination of 2 antibiotics, is inexpensive and fights a wide range of infections. It is an important medicine for people with HIV and can prevent the many infections that come as a result of infection with HIV.

Important

Avoid giving cotrimoxazole to babies less than 6 weeks old and to women in the last 3 months of pregnancy. Allergy to this medicine is common. Signs of allergic reaction are fever, difficulty breathing, or rash. Stop using it if a rash develops or if you think there may be an allergy.

How to use

Cotrimoxazole comes in different strengths of each of the 2 medicines it contains. So it may say 200/40 (meaning 200 mg sulphamethoxazole and 40 mg trimethoprim) or 400/80 or 800/160. A dose is sometimes described only in terms of the amount of trimethoprim (the second number).

- **6 weeks to 5 months:** give sulfamethoxazole 100 mg + trimethoprim 20 mg, 2 times a day for 5 days.
- 6 months to 5 years:** give sulfamethoxazole 200 mg + trimethoprim 40 mg, 2 times a day for 5 days.
- 6 to 12 years:** give sulfamethoxazole 400 mg + trimethoprim 80 mg, 2 times a day for 5 days.
- Over 12 years:** give sulfamethoxazole 800 mg + trimethoprim 160 mg, 2 times a day for 5 days.

Amoxicillin

Amoxicillin is a broad-spectrum penicillin, which means it kills many kinds of bacteria. It is usually interchangeable with ampicillin. When you see a recommendation for amoxicillin in this book, you will often be able to use ampicillin in its place, in the correct dose. Both are very safe and are especially useful for babies and small children.

Side effects

Amoxicillin often causes nausea and diarrhea (but not as often as ampicillin does). Avoid giving it to those who already have diarrhea if you can give another antibiotic instead.

The other common side effect is rash. But, raised, itchy bumps that come and go in a few hours are probably a sign of penicillin allergy. Stop giving the medicine right away and do not give the person a penicillin medicine again. Future allergic reactions may be more severe and even life-threatening. For some problems, erythromycin can be used instead, see Belly Pain, Diarrhea, and Worms, page 45. A flat rash that looks like measles, and usually appears a week after starting the medicine and takes days to go away, is not necessarily an allergy. But it is impossible to know for sure if the rash is from allergy or not, so it is usually better to stop taking the medicine.

Important ▲

Resistance to amoxicillin is growing more common. Depending on where you live, it may not work any more against staphylococcus, shigella or other infections.

How to use

Amoxicillin works well when taken by mouth. To give tablets or capsules to a baby, crush the pills or empty the capsules and divide the powder to get the amount you need. Then mix it into a little breast milk. Feed the milk and medicine to the baby with a cup or spoon.

As with other antibiotics, always give these medicines for at least the shorter number of days shown here. If the person still has signs of infection, have her continue taking the same amount every day until all signs of infection have been gone for at least 24 hours. If the person has taken the medicine for the maximum number of days and is still sick, stop giving the antibiotic and get medical help. For people with HIV, always give the medicine for the maximum number of days listed.

Likewise, the amount of antibiotic to take depends on the age or weight of the person and the severity of the infection. In general, give the smaller amount for a thinner person or a less severe infection, and the larger amount for a heavier person or a more severe infection.

- Give 45 to 50 mg per kg each day, divided into 2 doses a day. If you cannot weigh the person, dose by age:

Under 3 months: give 125 mg, 2 times a day for 7 to 10 days.

3 months to 3 years: give 250 mg, 2 times a day for 7 to 10 days.

4 to 7 years: give 375 mg, 2 times a day for 7 to 10 days.

8 to 12 years: give 500 mg, 2 times a day for 7 to 10 days.

Over 12 years: give 500 to 875 mg, 2 times a day for 7 to 10 days.

Water and Sanitation: Keys to Staying Healthy

Many of the problems that make us sick can be easily prevented. Some ways of preventing illness take extra time, effort, and money in the beginning, but they save time and money in the long run by avoiding illnesses.

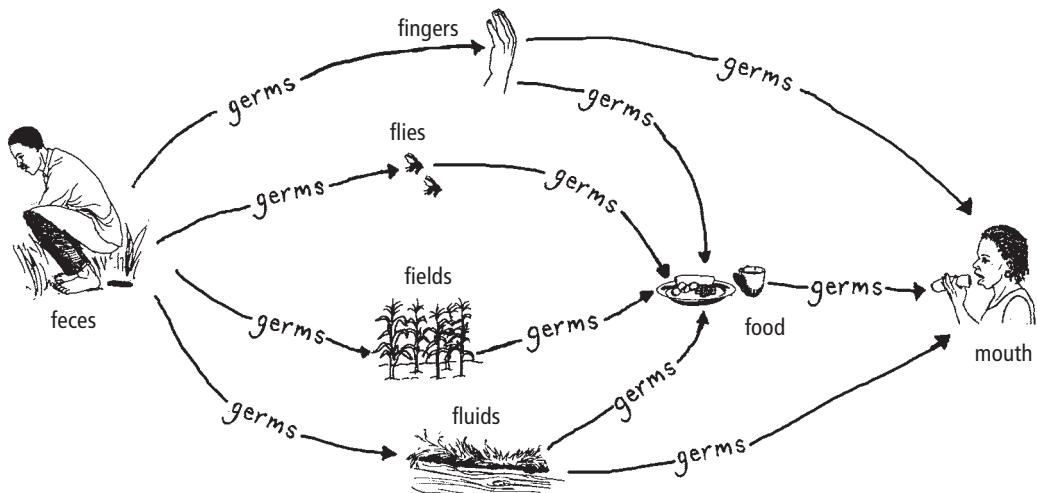
This chapter explains how to prevent diarrhea and other sicknesses caused by germs in human and animal waste (feces). Most belly and gut problems can be avoided by washing hands, using clean methods of preparing and storing food, using toilets, and drinking water that is safe to drink.

To learn how to prevent:

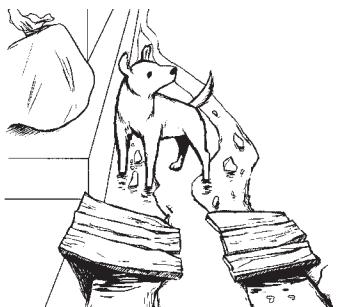
- malnutrition, diabetes, heart disease, and other problems caused by poor nutrition, see the Good Food Makes Good Health chapter.
- pneumonia, tuberculosis, and other breathing problems, see the Problems with Breathing and Coughing chapter (in development).
- health problems caused by garbage and other solid waste, see the Garbage, Medical Waste, and Pollution chapter (in development).
- malaria, dengue, and other diseases spread by mosquitoes, see the Illness from Mosquitoes chapter (in development).

How diarrhea disease is spread

Germs and worms cause disease by traveling these paths from human or animal waste.



Germs also spread from one person to another. Since family members are in close contact with each other, germs and illness can spread easily to the whole family.



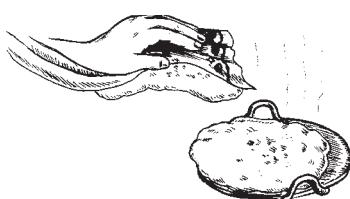
1. Heavy rains cause an open sewer to flood. A dog walks through the streets and gets feces on its feet.



2. The dog goes into a house and a child plays with it. The child gets feces on his hands.



3. Later the child cries and his mother comforts him. He holds onto her skirt making it dirty.



4. The busy mother prepares dinner. She uses her soiled skirt, to keep from burning her hands.



5. The family eats the food. Soon everyone has diarrhea.

What could have prevented the family's illness?

If any of these was true, the spread of illness could have been prevented:

- If the community did not have open sewers
- If the dog had not been allowed to come inside the house
- If the family helped the child wash his hands
- If the child had not wiped his hands on his mother's skirt

To the health worker

Promoting cleanliness and improving water are some of the best ways health workers can make their communities healthier. But when too many things need doing or changing, it can be overwhelming. Encourage people in your community to do the things they are already doing that keep them healthy, and find one or two important things to work on. To be successful and long-lasting, improvements to people's cleanliness and water should:

- **be simple and affordable** — they should fit local people's needs and abilities, and be easy to maintain.
- **be culturally acceptable** — they should fit local customs, beliefs, and desires.
- **work for everyone** — they should address the health needs of children, people with disabilities, women and men, and the elderly.

Washing Hands

One of the best ways to avoid getting sick from germs and worms is to wash hands with soap and water. Even if your hands look clean, germs and worm eggs can be on them. These can make you sick if they get into your mouth or on your food.

1. Run water over your hands to wet them.



2. Use soap and rub your hands together. The rubbing is what gets the germs off. Be sure to rub in between the fingers and around the fingernails too.



3. Run clean water over your hands to rinse them well.



4. Dry your hands with a clean cloth.



It is best to use soap to remove dirt and germs. If no soap is available, you can use sand or ashes.

Always wash your hands:

- after passing stool or cleaning a baby's bottom.
- before preparing food or eating.
- after touching animals.
- after sneezing or coughing.
- if you are sick.

Your health is in your hands. Wash often.



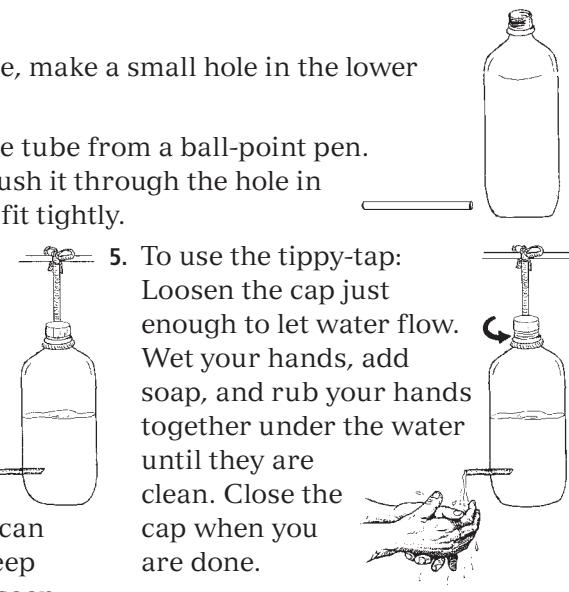
The tippy-tap

This simple hand-washing device allows you to wash your hands using very little water. It also allows you to rub both hands together while water runs over them, which removes germs. Put it wherever people need to wash their hands, such as where food is prepared, at the toilet, or at the market.

How to make a tippy-tap

To make this tippy-tap you need 1) a plastic bottle with a screw-on cap, like a soda bottle, and 2) the tube from a ball point pen, or some other small, stiff, hollow tube.

1. Clean the bottle.
2. Using a heated piece of wire, make a small hole in the lower part of the bottle.
3. Remove and clean the inside tube from a ball-point pen. Cut it off at an angle, and push it through the hole in the bottle. The tube should fit tightly.
4. Fill the bottle with water and replace the cap. When the cap is tight, no water should flow through the tube. When the cap is loose, water should flow out in a steady stream. When you are sure it works, put it where people can use it for hand-washing. Keep soap nearby or tie a bar of soap to the bottle.
5. To use the tippy-tap: Loosen the cap just enough to let water flow. Wet your hands, add soap, and rub your hands together under the water until they are clean. Close the cap when you are done.

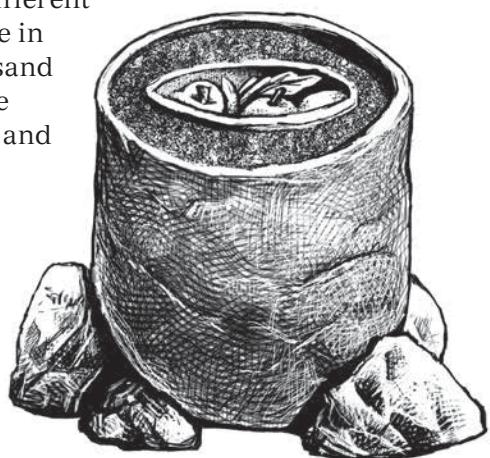
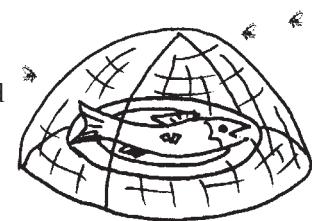
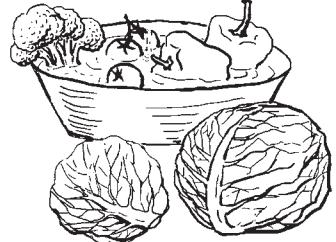


Preparing and Storing Food

Sickness can be spread by germs and worms that enter our bodies through the food we eat. To avoid getting sick from food:

- wash your hands before touching food or cooking.
- wash or peel fruits and vegetables, or cook them well before eating. This kills germs from the soil where they were grown, and any germs that got on them during transportation.
- cook meat products well before eating. Wash cooking surfaces after preparing meat so germs from uncooked meat, seafood, and eggs do not spread to food that is already cooked or to food you eat raw.
- eat food right away, or keep prepared food covered and safe from flies and dirt until it is ready to be eaten.
- reheat street food, or any food that has been left out, until it is hot. This will kill any germs before eating.
- store food in a way that keeps it safe from insects and rodents which can spread germs.
- keep the cooking area clean. Wash dishes, cutting surfaces, and utensils after each use and allow them to dry well.
- feed left-over food scraps to animals, or put them in a compost pile so they do not attract insects.
- keep food cold, which prevents it from spoiling as quickly.

Make a cooler using 2 unglazed clay pots of different sizes. Place 1 inside the other and fill the space in between the pots tightly with sand. Keep the sand wet by pouring water on it twice a day. Put the food you want to keep cool in the smaller pot, and keep the pots covered.



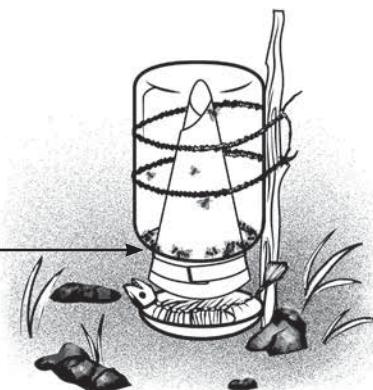
Keep flies off food



Flies spread germs and cause illness by landing on human and animal feces and then landing on the food we eat. Cover food and make fly traps to prevent flies from spreading germs.

How to make a fly trap

1. Tape or glue paper to make an open cone, then fit the cone inside a jar or bottle.
2. Seal around the opening of the bottle so there is no space between the cone and the bottle.
3. Hang the bottle from a string or attach it to a stick in the ground.
4. Put fruit, fish, or some other bait just under the trap. Flies will land on the food and then fly through the cone and into the bottle.
5. To empty the trap, turn it mouth up, remove the cone, fill with water to make sure the flies are dead, and then dump it out.



Put the fly trap near toilets and places where food is prepared to reduce flies.

Toilets for Health (Sanitation)

Cleanliness in the community is just as important as cleanliness for individuals and families. Sanitation means public cleanliness — using clean and safe toilets, keeping water sources clean, and disposing of garbage safely (see Garbage, Medical Waste, and Pollution - in development). Poor sanitation causes a great deal of unnecessary sickness and death.

Any community effort to improve sanitation must help people overcome the challenges they face in their daily lives. Poverty and lack of access to enough water often make it difficult for people to improve sanitation.

Experts may offer technical solutions, such as flush toilets or complex sewage treatment systems. These kinds of technical solutions may work in some places, but that does not mean they will solve the problems of your community or that people will use them. A health worker who knows and listens to the needs of the people will have important information the expert does not have. Experts and community members should work together to solve problems.



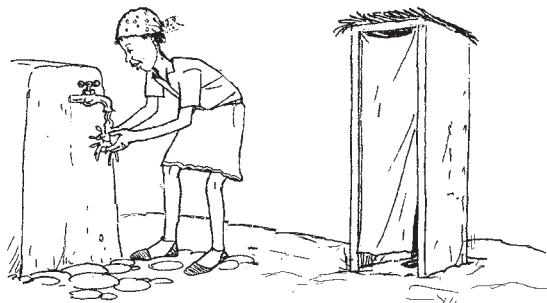
Include women in the discussions about the community's needs and possible solutions. Women often care for children and the home, so they may recognize sanitation and water issues that the men do not see. When everyone is involved in making decisions and works together to improve sanitation, everyone benefits.

Use toilets to manage human waste

When human waste (feces) is not managed well, it pollutes water, food, and soil with germs, and leads to diarrhea and other serious health problems. Using toilets prevents germs from getting into the environment, and protects the health of the whole community.

Health is not the only reason to build and use toilets. People also want:

- **Privacy:** A toilet can be as simple as a deep hole in the ground. But the need for privacy makes it important for a toilet to have a good shelter with a door or curtain. Shelters can be made from local materials, or they can be made from concrete.
- **Safety:** For a toilet to be safe it must be well built and in a safe place. No one will use a toilet if they are worried about it collapsing. And if the toilet is far from the home, or in an isolated place, women may not feel safe using it.
- **Comfort:** People will more likely use a toilet with a comfortable place to sit or squat, and a shelter large enough to stand in. They will also be more likely to use a toilet that is nearby the house and is sheltered from wind, rain, or snow.
- **Cleanliness:** If a toilet is dirty and smelly, no one will want to use it. A toilet also must be clean to prevent the spread of germs. Sharing the task of cleaning will help make sure that toilets are properly used and cared for.
- **Respect:** A well-kept toilet brings status and respect to its owner. This can be what motivates people to spend the money and effort to build one.

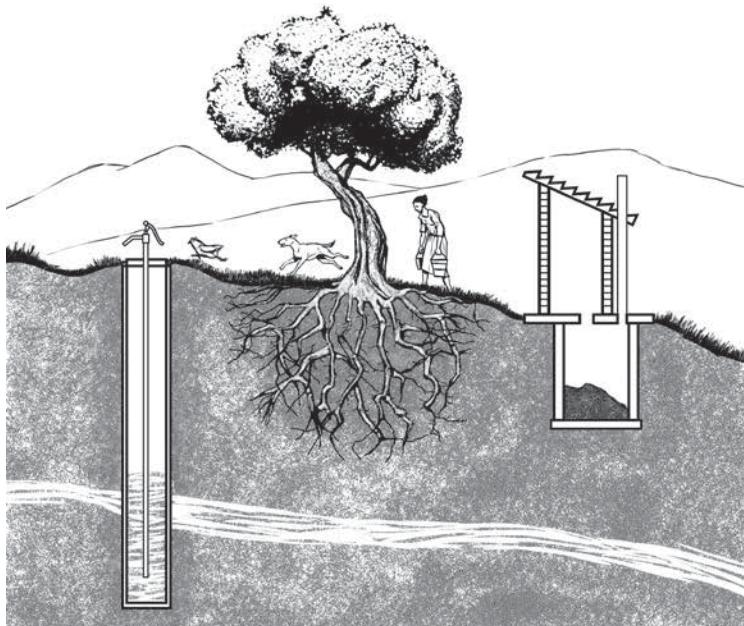


Where to build a toilet

When deciding where to build a toilet, make sure it will not pollute any water sources such as rivers, wells, or springs. A toilet should be at least 20 meters from all water sources.

Also be sure the toilet will not pollute the groundwater. Groundwater flows at different depths underground in different places. The risk of groundwater pollution depends on the type of soil, the amount of rain or moisture in the area, and the depth of the groundwater. Keep in mind that water levels are much higher in the rainy season than in the dry season. But some general rules include:

- The bottom of the pit should be at least 2½ meters above the groundwater.
- If you dig a pit for a toilet and the soil is very wet, or if the pit fills with water, this is a bad place to put a toilet. Germs from the human waste will contaminate the groundwater.
- Do not build pit toilets on ground that gets flooded.
- When there is a risk of groundwater pollution from pit toilets, consider building an above-ground toilet. If there is no choice but to build a toilet in a place where there is a risk of groundwater pollution, place the toilet downhill from nearby wells so the germs will flow away from the wells.



Groundwater is water that has soaked into the earth and flows underground. When building a toilet, make sure the pit is not so deep that it will pollute the groundwater.

Types of toilets

There are many kinds of toilets, and no one kind is right for every community or household. When deciding what kind of toilet to build, think about the needs of those who will be using it and the kind of space you have for it. Also think about whether you and your family will want to use and maintain a composting toilet; if not, then the pit toilet may be best for you.

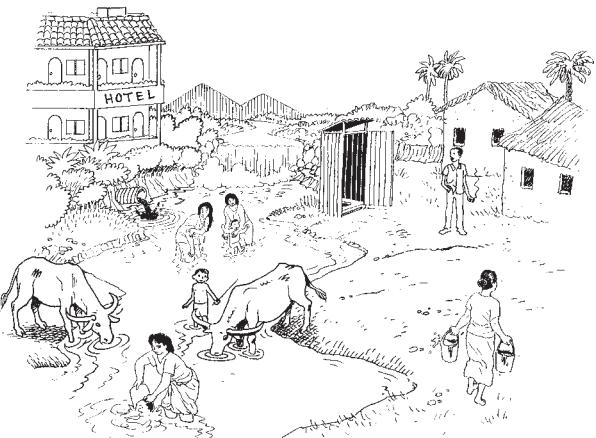
There is no perfect toilet. Each has its drawbacks. But the 3 types of toilets described in this chapter are good at keeping communities clean and healthy, with the least harm to the environment and to people. All 3 types use no water.

Most water flush toilets only move the problem (feces and germs) from one place to another, they contaminate a lot of water while doing so (see below), and they do not make human waste safe. To use water to clean after passing stool, there are safe toilets you can build that do not contaminate the environment, for example, the pour-flush toilet. To learn how to make this toilet, see *A Community Guide to Environmental Health*, chapter 7.

Flush toilets and sewage systems

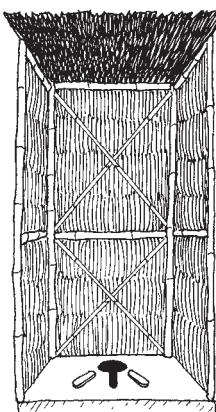
Flush toilets use water to carry waste away through pipes called a sewage system. They improve health, especially in crowded urban areas, and are often the kind of toilets people want.

But flush toilets have a lot of problems that may not be obvious. The sewage must be treated to remove germs from the water before it returns into waterways or for reuse. This is costly, so often sewage is dumped into rivers, lakes, or the ocean without being correctly treated. This spreads the germs from the sewage into our water systems or those of our neighbors.



Many of the chemicals used to treat sewage contaminate sources of drinking water and land where people live and farm. Flush toilets also waste fresh water that is needed for drinking and farming. While so many people lack enough water to drink, it is wrong to flush so much water down the drain.

Closed pit toilet



A closed pit toilet has a platform with a hole in it and a lid to cover the hole when it is not in use. The platform can be made of wood, concrete, or logs covered with earth. Concrete platforms keep water out and reduce health problems because they are easy to clean. A closed pit toilet should have a lining or concrete ring beam to prevent the platform or the pit itself from collapsing. See the next page.

Adding a vent pipe to reduce smells and flies (called a “ventilated improved pit,” or VIP, toilet) is an improvement that makes pit toilets much more pleasant to use.

A closed pit toilet that is 2 meters deep will last a family of 5 people about 5 years.

A problem with pit toilets is that once the pit is full, the toilet can no longer be used. However, you can easily take advantage of the waste in a full — but unlined — pit by moving the shelter somewhere else and planting a tree on the site. Or, with only slightly different daily maintenance, you can build a composing toilet to turn the waste in a lined pit toilet into useful compost. See page 13.

To make a closed pit toilet

1. Choose a location that will be easy for people to get to and does not risk contaminating water sources.
2. Dig a hole less than 1 meter across and at least 2 meters deep. If the soil is very sandy, you can line the pit with empty oil drums stacked on top of each other or cement bricks, so the pit does not collapse.
3. Line the top of the pit with logs, stones, brick, a concrete ring beam, or other material that will support a platform and prevent the walls of the pit from falling in.
4. Make a platform and a shelter to put over the pit. The platform can be made from concrete or local materials like logs or a mix of bamboo and mud. If you make a platform from logs, use wood that does not rot quickly.



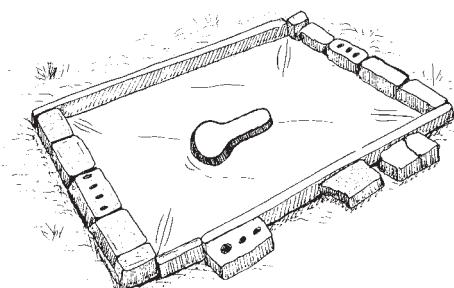
How to make a concrete toilet platform and ring beam

A well-made concrete platform and ring beam will prevent a pit toilet from collapsing. A concrete platform also makes it easier to keep the toilet clean.

One 25 kilo bag of cement is enough to make 1 platform and 1 ring beam. It is easiest to make them both at the same time. You will also need reinforcing wires, bricks, and boards to form the mold, and a piece of wood cut to the shape of a keyhole to mold the hole. The platform and ring beam shown here are square, but you could make round ones.

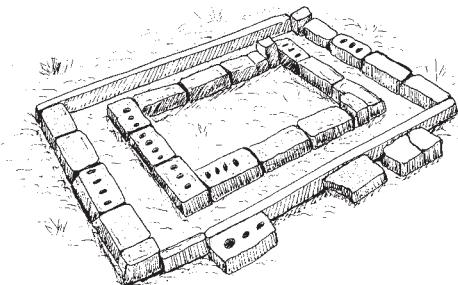
1. Lay down a plastic sheet or used cement bags on flat ground. On top of this make a mold of bricks or boards.

Toilet Platform



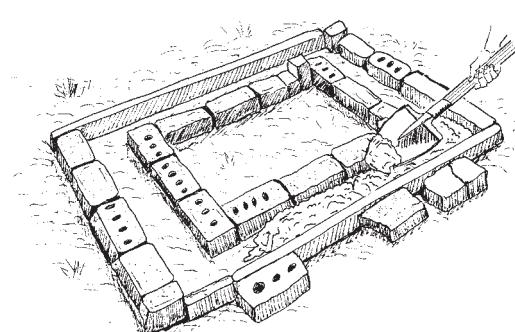
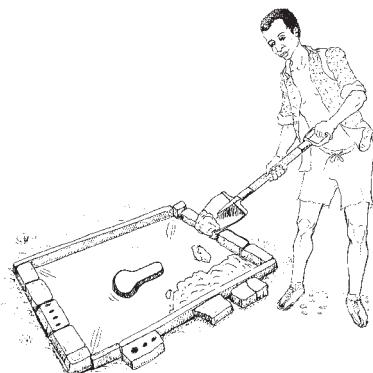
Make the platform about 120 cm long, 90 cm wide, and 6 cm high. Place a wooden "keyhole" mold, or a few bricks in the center to shape the toilet hole.

Ring Beam



Make the ring beam 130 cm long and 1 m wide on the outside, and 1 m long and 70 cm wide on the inside.

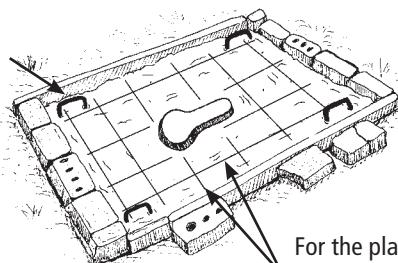
2. Make a concrete mix of 1 part cement, 2 parts gravel, 3 parts sand, and water. Pour the concrete into the mold until it is half-way to the top.



3. Place 3 mm thick reinforcing wires on top of the wet concrete.

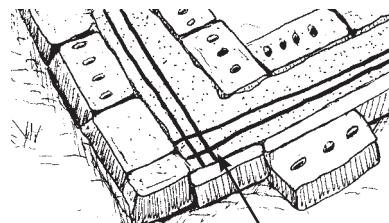
Toilet Platform

Make handles from wire 8 to 10 mm thick and set them in the concrete near the corners.



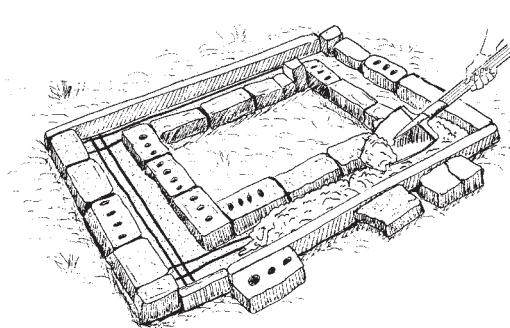
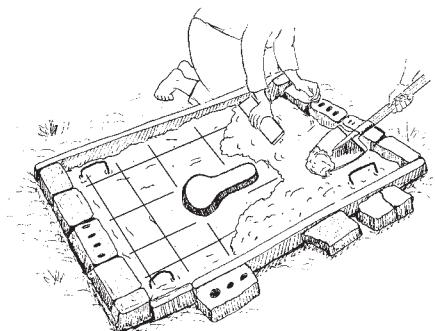
For the platform:
use 4 to 6 wires
in each direction.

Ring Beam



For the ring beam:
lay wire on each
side of ring beam.

4. Pour the rest of the concrete and level it with a block of wood.



5. Remove the keyhole mold from the platform when the concrete begins to harden (after about 3 hours). If you used a brick mold, remove the bricks and form the hole into a keyhole shape.
6. Cover the concrete with wet cement sacks, damp cloth, or a plastic sheet. Wet it several times a day to keep it damp for 7 days. Keeping it damp makes the concrete dry more slowly and become stronger.
7. When the concrete is completely hardened, carry the ring beam to the toilet site. Level the ground, place the ring beam and dig a pit inside of it. Pack soil around the outside of the ring beam to set it in place. Then place the platform over the pit.
8. Make a cover for the hole from concrete or wood. It can have a handle, or can be made to be moved by a person's foot, to avoid getting germs on the hands.



Composting toilets

A composting toilet stores human waste until it breaks down and becomes compost. The mix will heat up and over time will kill the harmful germs, including roundworm eggs which are the hardest to kill. Composting toilets may seem like a strange idea at first, but when used properly they are a very safe way to manage human waste and improve soil quality at the same time.

Dig a pit 1 meter deep, and less than 1 meter across. Line the pit and build a platform as you would for any other pit toilet. But make the shelter moveable.



To use and maintain a composting toilet

- Before using, put dry leaves or straw in the pit. This will help feces decompose.
- Add a handful of soil mixed with ashes or dry leaves after every use. This reduces smells and helps the waste to break down.
- Do not put plastic, tins, or other garbage in the toilet.
- Sweep and wash the platform often. Be careful not to get much water or cleaning chemicals in the pit.
- When the hole is nearly full, remove the shelter, platform, and ring beam. (It will take about 1 year for a family of 5 to nearly fill a composting toilet that is 1 meter deep.)
- Fill the hole with 15 cm of soil mixed with plant matter. After several weeks, the waste will settle.
- Add more soil and plant matter, water, and plant a tree. Fruit trees grow well and bear abundant fruit that is safe to eat.



- Alternatively, the compost can also be dug out and used to fertilize other trees or food crops, but only if it is completely broken down. So let it decompose for at least 1 year and only use it if it has become an odorless, crumbly soil.
- Move the shelter, platform, and ring beam to another place, dig a hole, and do it again.

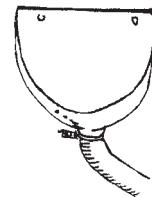
A composting toilet for places with little land

This toilet is useful for places where people live very close together and do not have extra outdoor space for pit toilets. It can even be built inside a home and should not smell much if it is maintained and cleaned regularly.

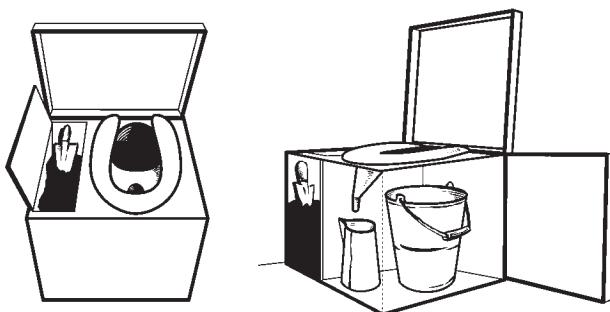
For this toilet, you must separate urine so feces can dry out and turn into compost more quickly. Separating urine also reduces the smell.

1. Build a wood box that is large enough to fit a 5 gallon bucket inside. The top will need a hole with a seat and the side of the box can be hinged so that the bucket can be taken out.

2. Put in a urine diverting toilet bowl. You may be able to buy this, or make one by cutting the bottom and side from a plastic jug, and then attaching it to the front of the hole.



3. Attach one end of a tube to the part of the toilet bowl (or spout of the plastic jug) that diverts the urine. Put the other end of the tube in a jug to collect the urine.



4. Put a 5 gallon bucket under the toilet bowl to collect feces.

5. A lid will keep flies away and reduce the smell.

To use and maintain this toilet

It is important that everyone who uses the toilet is taught how to use it correctly.

- Before using, put a layer of dry leaves or straw in the bucket. This will help keep the bucket clean.
- Add a handful of soil mixed with ashes or dry leaves to the bucket after every use. This reduces smells and helps break down the feces. Do not put garbage such as plastic or tins in the toilet. Keep liquids, including urine, out of the bucket. If the bucket contents get wet, add more soil or ash.

- The urine will flow through the tube to be collected in a container. Pour the urine out somewhere away from homes or the urine can be mixed with water and used as fertilizer. For fertilizer, use 3 parts water to 1 part urine and add to plants up to 3 times a week.
- When the bucket is filled with feces (about 2 weeks for a family of 5) empty it into a large container with a lid. This is where the waste will be stored. When this container is full, store it for 1 year (in a sunny place, if possible) until the waste has turned into compost. After 1 year, the compost can be added to fields, gardens, or potted plants. A family may need several large containers to store all the waste.
- After each time you empty the bucket, clean it with water mixed with chlorine to kill the germs.
- When the toilet is not in use, close the lid of the box. This will reduce smell.



Composting toilets like these take work to maintain. But when used properly, they are a great way for communities without a lot of space to manage their human waste, and even make a valuable product from it.

Composting toilets for urban areas

A lot of people in a small area means a lot of human waste, and often a lot of sickness caused by germs from human waste.

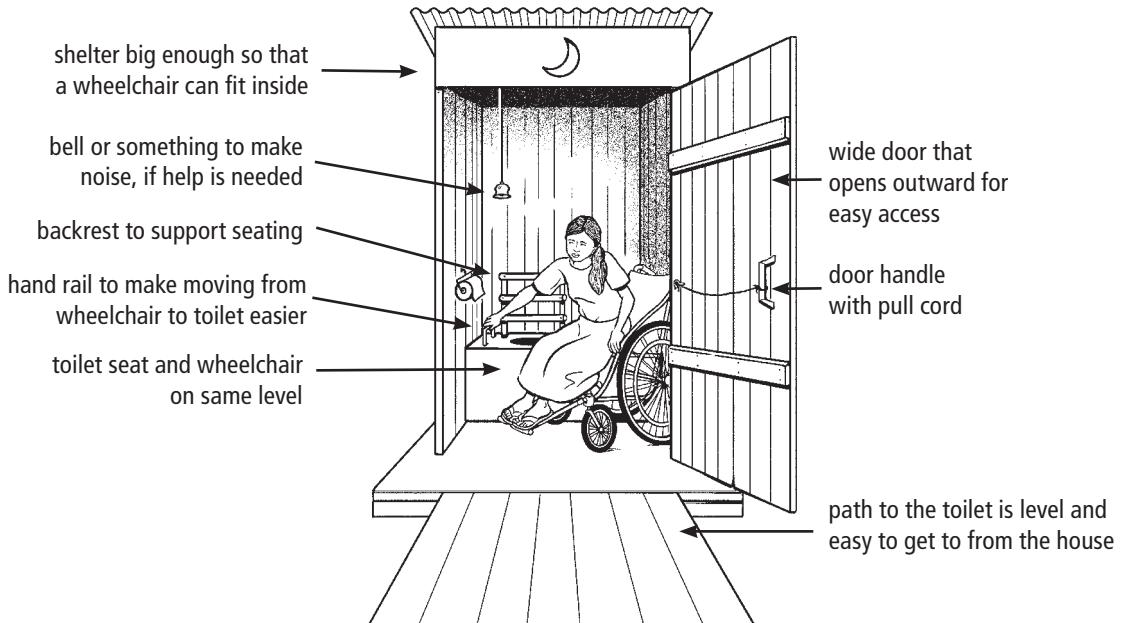
A group in Haiti called Sustainable Organic Integrated Livelihoods (SOIL) works in urban communities to transform wastes into resources. SOIL has developed a program that (for a small fee) rents out composting toilets to families, and collects the waste from each home every week. The waste is transported to a site where it is turned into valuable compost which is then sold or used to grow food.



Much of SOIL's work is educating people about the safety of composting toilets. One of the best ways they do this is to show the final product from the toilets. Once people see for themselves that what was once human waste has now become nutrient-rich compost, they soon become excited to transform something that was making them sick into a resource that helps them and their environment.

Toilets should work for everyone in the community

Talk with everyone who will use the toilet to find out what might make it easier for them to use. This picture shows ways to adapt a toilet for a wheelchair rider.



Remember, a person with a disability feels the same need for privacy as anyone else and should get the privacy he or she needs.

Water and Health

Water is essential for life. We need it, as do the animals and plants that we depend on for our survival. In communities that lack adequate water, many health problems arise.

- Without water, people cannot grow enough food to eat, leading to malnutrition and the many health problems that go along with it.
- Infections of the eyes and skin arise when people cannot use water to bathe. Other illness also spreads more quickly when people cannot stay clean.
- Those who collect the water (usually women and children) spend much of their time in the exhausting work of traveling to and carrying water. This leaves little time for school, other work at home, or community life.



Water that is safe to drink

In addition to enough water, people also need water that is safe to drink, free of dangerous germs and harmful chemicals. Contaminated water causes:

- hepatitis A, typhoid fever, and other deadly diseases.
- diarrhea, which leads to dehydration and can cause death especially for children.
- infections such as schistosomiasis that can lead to anemia and malnutrition.

Different methods for making water safe are described on the following pages. It is also important for your community to prevent water from being polluted or made scarce in the first place.



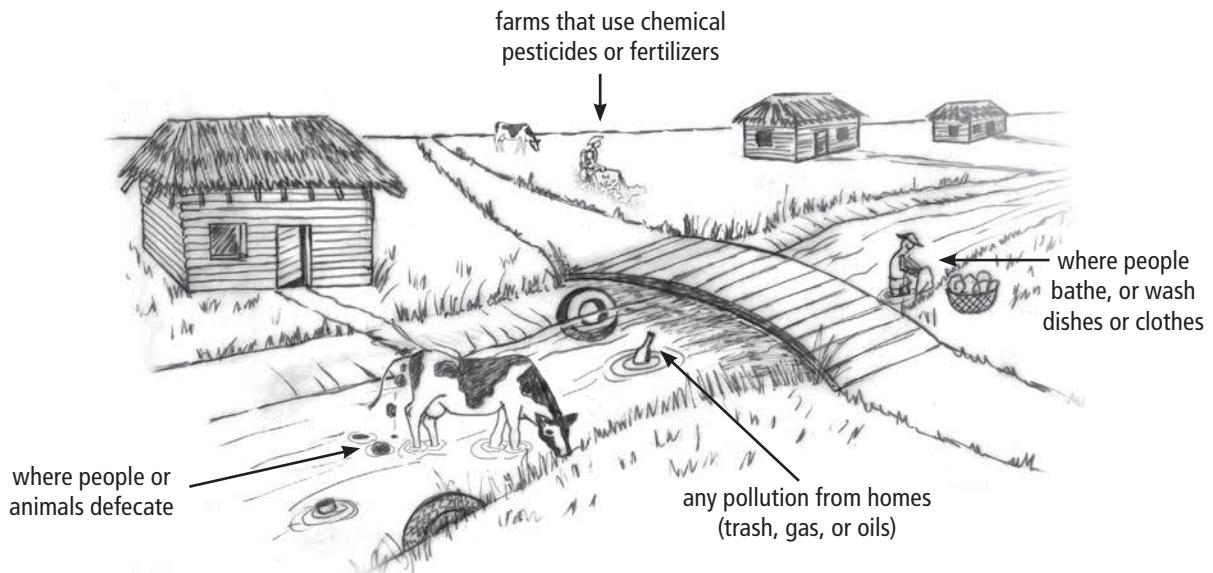
Chemical contamination

In places with industrial activity such as mining or factories, water may be overused and polluted. Poisonous chemicals get in water from agriculture, mining, industry, and dumping trash. This causes skin rashes, cancers, and other serious health problems. **Water that has been contaminated with chemicals is never safe to drink.** Chemical pollution of our water can be solved only when a community puts pressure on governments and enforces rules on industry. For more on protecting water sources, see chapter 6 in *A Community Guide to Environmental Health*.

With enough safe water, children grow healthier and have less diarrhea disease.

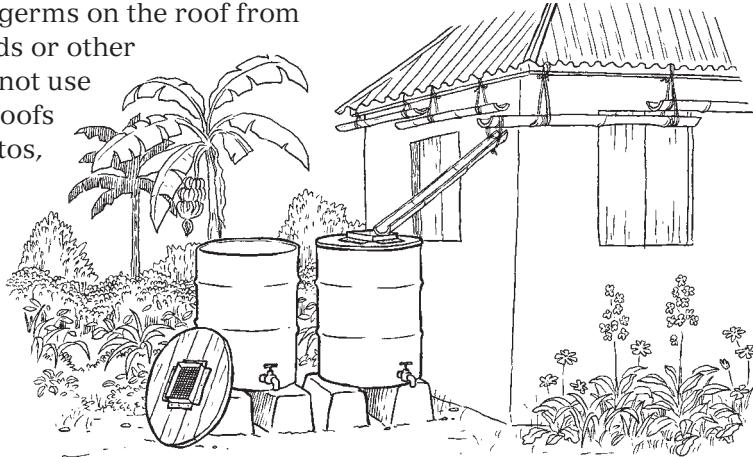
Collecting water

Water should be taken from the cleanest possible place. When collecting water from rivers, collect upriver from:



Collecting rainwater

Rainwater is easy to collect off roofs and into containers placed next to the house. Roofs made of tin or corrugated metal are best to catch water. The water needs to be treated (see the next page) to make it safe to drink because there may be germs on the roof from dirt, or feces from birds or other animals. However, do not use water collected from roofs made with lead, asbestos, or tar because these have toxic chemicals in them that make water collected on them unsafe to drink. When collecting or storing rainwater, make sure your container is clean and was never used to store chemicals, such as oil or pesticides.



Making water safe to drink

Making water safe to drink is one of the best ways to prevent diarrhea and disease. Water from any source will need to be treated if there are germs in it. Even if water from pipes, tanks, or wells looks clear, it could still be contaminated and needs treatment.

When deciding which water treatment method to use, think about how much water you need, what it is contaminated with, and what resources are available. The chart below can help you decide which method to use if you know a particular problem is common in your area. The method you use may change depending on the season or where you are. For example, you may use one method at home and another when you are working in the fields.

Problem	Filter methods		Disinfection methods			
	Cloth Filter	Charcoal Filter	Boiling	Chlorine	Sunlight	Lemon or Lime juice
Viruses (such as hepatitis A and typhoid)			💧	💧	💧	
Bacteria (such as shigella and e. coli)		💧	💧	💧	💧	
Amebas		💧	💧			
Giardia		💧	💧	💧	💧	
Cryptosporidium		💧	💧			
Cholera	💧	💧	💧	💧	💧	💧

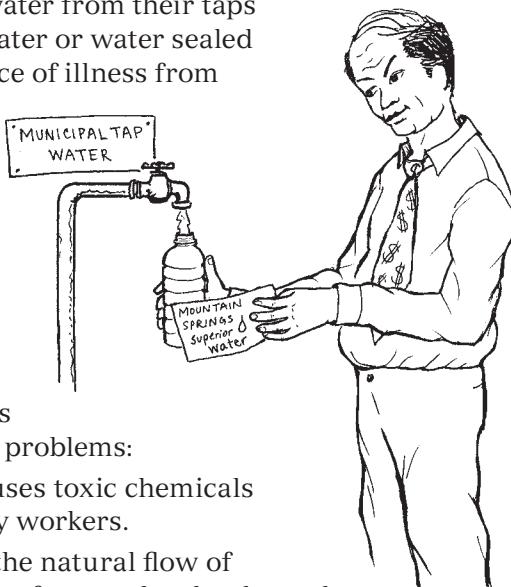
This chart shows which germs and parasites the different methods kill.
The water drop in the chart means that method is effective at killing that germ.

If there is more than one cause of water-borne disease where you live (which is often the case), the best solution may be to combine two methods: filter and disinfection.

Bottled water causes problems

When people do not trust that water from their taps is clean, they may buy bottled water or water sealed in plastic bags to avoid the chance of illness from germs in the tap water. But just because water is sold in a bottle does not mean it is safe. In many cases, bottled water is just tap water in a bottle, but sold at a much higher price. And bottled water is often too expensive for most people to afford, denying their right to water. Bottling water also causes many health and environmental problems:

- Making plastic water bottles uses toxic chemicals that harm the health of factory workers.
- Filling bottles often disrupts the natural flow of water, creating water shortages for people who depend on that water source.
- Transporting bottled water from the factory to where it is sold creates air pollution, harming the health of both people and the environment.
- The waste created by the discarded bottles pollutes the land and waterways. If the bottles are burned, we breathe the toxic fumes released into the air, causing health problems.
- When more people start drinking bottled water, the public water systems — piped water for everyone — are often neglected. When more people use public water systems, together they can pressure that the system be maintained and improved.



*Bottled water is costly and causes problems.
Providing safe water systems for everyone solves problems.*

Filtering water

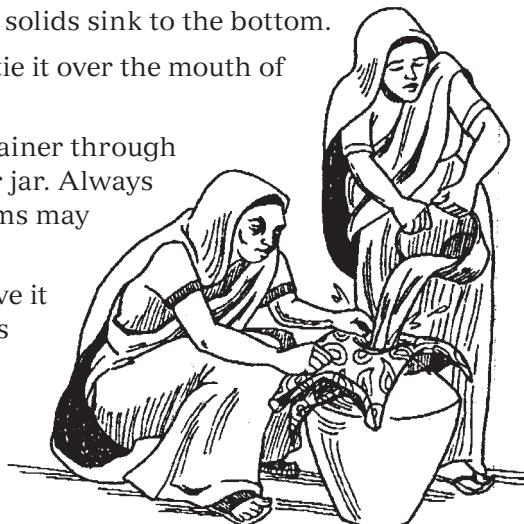
There are many ways to filter water to make it safer. Cloth and charcoal filters are explained below. Other kinds of filters, such as slow sand and ceramic filters, are explained in *A Community Guide to Environmental Health*, chapter 6.

If your water is not clear, first let the water settle in a container for a few hours to allow dirt, solids, and parasites to fall to the bottom of the container. Pour the clear water through the filter. Try not to disturb the dirt that settled to the bottom of the container. Then clean the container.

Cloth filters

In Bangladesh and India, people use a filter made of finely woven cloth to remove cholera germs from drinking water. The cholera germ often attaches to a tiny animal that lives in water, and filtering out these animals also filters out most cholera germs. You can make a cloth filter out of handkerchiefs, linen, or other fabric such as the cloth used to make saris. Old cloth works better because worn fibers make the spaces in the weave smaller and better for filtering.

1. Let water settle in a container so that solids sink to the bottom.
2. Fold the cloth 4 times and stretch or tie it over the mouth of another container or jar.
3. Pour water slowly from the first container through the cloth into the second container or jar. Always use the same side of the cloth, or germs may get into the water.
4. After using the cloth, wash it and leave it in the sun to dry. This kills any germs that may be left in the cloth. In the rainy season, disinfect the cloth with bleach.



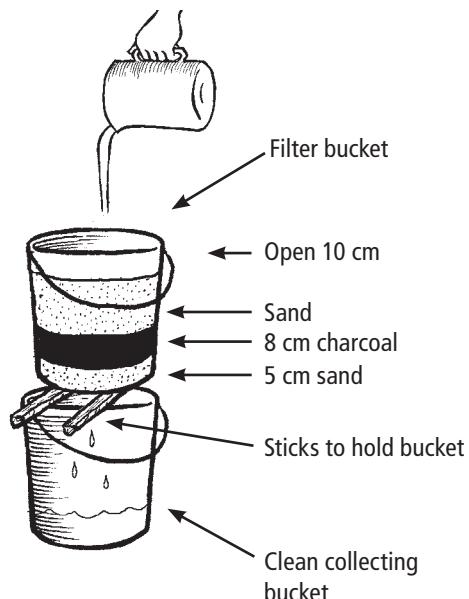
Charcoal filters

To make a charcoal filter, you will need 2 clean metal or plastic buckets, a hammer, 1 or 2 large nails, a bucketful of coarse sand, and $\frac{1}{4}$ bucket of wood charcoal.

1. Make holes in the bottom of one of the buckets. Wash the bucket. This will be the filter bucket.
2. Clean the sand by rinsing it in water and draining until the water that drains is clear.
3. Put a layer of washed sand 5 cm deep into the filter bucket and pour water over it. Water should run out through the holes. If no water runs out, make the holes bigger. If sand runs out, the holes are too large. If this happens, remove the sand, place a thin cloth over the holes, and replace the sand.
4. Crush charcoal into small pieces. Activated charcoal works best, but ordinary wood charcoal will also work. Never use charcoal briquettes, they are poison!
5. Place a layer of crushed charcoal about 8 cm deep on top of the sand. Then fill the bucket with more washed sand until the sand is 10 cm below the top of the bucket.
6. Place 2 sticks on top of the second bucket and set the filter bucket on these sticks. Pour clean water through the filter bucket. When the water comes out clear into the collecting bucket, the filter is ready for use.
7. Allow water to settle before pouring it through the filter.

Because the germs that are filtered out will grow on the charcoal, it is important to remove and clean the charcoal every few weeks if the filter is used daily, or any time the filter has been unused for a few days. To clean the charcoal, take it out of the filter and run water over it until it drains quickly. Let it dry, in bright sun if possible. Then put the charcoal back in the filter.

It is even safer to disinfect water after filtering by boiling, adding chlorine, or using sunlight. (See pages 23 to 24.)



Disinfect Water

Boiling water

Bring water to a rapid boil. Continue boiling for 1 full minute before taking the pot off the fire to cool. In high mountain areas, water must boil for 3 minutes.



Boiling water for 1 minute kills germs and makes water safe for drinking.

Boiling may change the taste of water, especially if boiled over a wood fire. If the taste bothers you, pour the cooled water in a bottle and shake it. Shaking adds air to the water and improves the taste.

Boiling water after food is prepared, but before the fire dies, is one way to use less firewood.

Chlorine

The amount of chlorine needed to disinfect water depends on how contaminated the water is. The more germs there are in the water, the more chlorine is needed to kill them. When the correct amount is used, the water will smell and taste just slightly of chlorine. This tells you it is safe to drink. If it has too much, the smell and taste will be strong and unpleasant.

Chlorine comes in different concentrations. The amounts listed below show how to disinfect water using household bleach with 5% chlorine (sodium hypochlorite). Read the label to see what percent of chlorine is in your bleach. If the bleach is 3% chlorine, you will need to use more. If your bleach label includes instructions for disinfecting water, follow those instructions. Do not use bleach that has soap or perfume added to it.

If the water is cloudy or has a lot of solid matter in it, filter the water before adding chlorine.

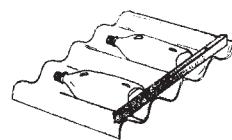
After adding the right amount of chlorine, stir well and wait at least 30 minutes before drinking. **If the water does not smell or taste just slightly of chlorine** after adding the amount listed, add the same amount again. Stir and wait before drinking.

Water	Add Bleach (5%)
For 1 liter or 1 quart	2 drops
For 1 gallon or 4 liters	8 drops
For 5 gallons or 20 liters	1/2 teaspoon
For a 200 liter barrel	5 teaspoons



Sunlight

Sunlight (solar disinfection) works best in countries close to the equator, because the sun is strongest there. The farther north or south you are, the more time is needed for sunlight to work.



Filtering the water first to make it clearer will also make it disinfect more quickly. Clean a plastic or glass bottle, or a plastic bag. Clear plastic soda bottles are the best to use. Fill the bottle half full, then shake it for 20 seconds. This adds air bubbles which help disinfect the water faster. Then fill the bottle to the top. Place the bottle where there is no shade and where people and animals will not disturb it, such as the roof of a house. Leave the bottle for at least 6 hours in full sun, or for 2 days if the weather is cloudy.

Lemon or lime juice

Add the juice of a lemon or lime to 1 liter of drinking water and let it sit for 30 minutes. The acid from the juice will kill most cholera and some other germs as well. This method is not very good because plenty of germs may remain in the water, but it is better than no treatment, especially in areas where there is cholera.



Store water safely

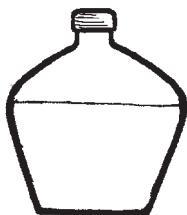
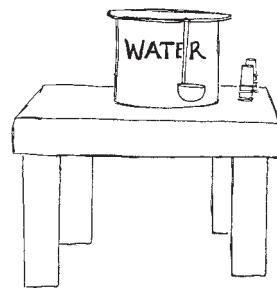
After water has been filtered or disinfected it must be stored safely. Otherwise it can easily become contaminated again. Water stored in tanks with cracked walls may not be safe. Likewise containers with loose, poorly made, or missing covers, do not prevent water from becoming contaminated by germs.

Covered tanks and cisterns are safer for storing water than open tanks because mosquitoes and snails cannot live in closed containers. Locate water storage as close as possible to where the water will be used.

Stored water can also become unsafe when it is touched by dirty cups, dirty hands, when clean water is poured into a dirty container, or when dirt or dust gets in the water.

To prevent water from becoming contaminated during storage:

- pour water out without touching the mouth of the container, or use a clean, long-handled dipper to take water out of the container. Do not let the dipper touch anything else, or it will contaminate the clean water when it is used again.
- empty and clean out the container with hot water every 2 or 3 weeks.
- keep containers covered.
- keep drinking cups clean.
- never store water in containers that have been used for pesticides or toxic chemicals.
- do not treat more water than you need for short-term use, if possible. For drinking and preparing food, that is usually about 5 liters for each person each day.



Narrow mouthed containers
keep more germs out, so are
safest for storing water.

Water for everyone

Good health depends on having enough good water. This means our right to health depends on our right to water. While we can work to protect water sources, and treat water to make it safe, our health is still threatened if mining, run-off from fertilizers and pesticides, or factories pollute our water.

Governments and communities must work together to protect, improve, and extend water systems so they provide people with enough safe water. Private companies say if we let them take control of our water, they can provide better service than governments and still make a profit. This is called water privatization. But usually what happens is that the price of water goes up, denying people access to their own water. This leads to serious health problems when people use less water than they need or when they collect water wherever they can for free, even if the water is contaminated with germs or toxic chemicals.

To keep people and the environment healthy, we need public water systems that provide water that is safe to drink for everyone. Community controlled water systems can be managed so people's health, not making money, is the top priority.

The selection and use of essential medicines

2023

Web Annex A

World Health Organization

Model List of Essential Medicines

23rd list
(2023)



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WHO Model List of Essential Medicines – 23rd List (2023)

Explanatory notes

The **core list** presents a list of minimum medicine needs for a basic health-care system, listing the most efficacious, safe and cost-effective medicines for priority conditions. Priority conditions are selected on the basis of current and estimated future public health relevance, and potential for safe and cost-effective treatment.

Where the [c] symbol is placed next to an individual medicine or strength of medicine on the core list it signifies that there is a specific indication for restricting its use to children.

The **complementary list** presents essential medicines for priority diseases, for which specialized diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training are needed. In case of doubt medicines may also be listed as complementary on the basis of consistent higher costs or less attractive cost-effectiveness in a variety of settings.

Where the [c] symbol is placed next to an individual medicine or strength of medicine on the complementary list it signifies that the medicine(s) require(s) specialist diagnostic or monitoring facilities, and/or specialist medical care, and/or specialist training for their use in children.

The **square box symbol (□)** is intended to indicate therapeutic alternatives to the listed medicine that may be considered for selection in national essential medicines lists. Alternatives may be individual medicines, or multiple medicines within a pharmacological class or chemical subgroup, defined at the 4th level of the [Anatomical Therapeutic Chemical \(ATC\) classification](#), which have similar clinical effectiveness and safety. The listed medicine should be the example of the class or subgroup for which there is the best evidence for effectiveness and safety. In some cases, this may be the first medicine that is licensed for marketing; in other instances, subsequently licensed compounds may be safer or more effective. Where there is no difference in terms of efficacy and safety data, the listed medicine should be the one that is generally available at the lowest price, based on international drug price information sources. Not all square box listings are applicable to medicine selection for children. A square box is not used to indicate alternative generic brands of the same small molecule medicines, nor alternative biosimilars of biological medicines. However, the selection and use of quality-assured generics and biosimilars of essential medicines at country level is recommended.

National lists should not use a similar symbol and should be specific in their final selection, which would depend on local availability and price.

The [a] symbol indicates that there is an age or weight restriction on use of the medicine; details for each medicine can be found in Table 1.1.

The presence of an entry on the Essential Medicines List carries no assurance as to pharmaceutical quality. It is the responsibility of the relevant national or regional drug regulatory authority to ensure that each product is of appropriate pharmaceutical quality (including stability) and that, when relevant, different products are interchangeable.

For recommendations and advice concerning all aspects of the quality assurance of medicines see the WHO website <https://www.who.int/teams/health-product-and-policy-standards/standards-and-specifications/norms-and-standards-for-pharmaceuticals/guidelines/quality-assurance>

Medicines and dosage forms are listed in alphabetical order within each section and the order of listing does not imply preference for one form over another. Standard treatment guidelines should be consulted for information on appropriate dosage forms.

The main terms used for dosage forms in the Essential Medicines List can be found in Table 1.2.

Definitions of many of these terms and pharmaceutical quality requirements applicable to the different categories are published in the current edition of *The International Pharmacopoeia*. <https://www.who.int/teams/health-product-and-policy-standards/standards-and-specifications/norms-and-standards-for-pharmaceuticals/pharmacopoeia>.

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1. ANAESTHETICS, PREOPERATIVE MEDICINES AND MEDICAL GASES	
1.1 General anaesthetics and oxygen	
1.1.1 Inhalational medicines	
halothane	Inhalation.
isoflurane	Inhalation.
nitrous oxide	Inhalation.
oxygen	Inhalation (medical gas).
sevoflurane	Inhalation.
1.1.2 Injectable medicines	
ketamine	Injection: 50 mg/mL (as hydrochloride) in 10 mL vial.
<input type="checkbox"/> propofol Therapeutic alternatives: - thiopental	Injection: 10 mg/mL; 20 mg/mL.
1.2 Local anaesthetics	
<input type="checkbox"/> bupivacaine Therapeutic alternatives to be reviewed	Injection: 0.25%; 0.5% (hydrochloride) in vial. Injection for spinal anaesthesia: 0.5% (hydrochloride) in 4 mL ampoule to be mixed with 7.5% glucose solution.
<input type="checkbox"/> lidocaine Therapeutic alternatives to be reviewed	Injection: 1%; 2% (hydrochloride) in vial. Injection for spinal anaesthesia: 5% (hydrochloride) in 2 mL ampoule to be mixed with 7.5% glucose solution. Topical forms: 2% to 4% (hydrochloride).
lidocaine + epinephrine (adrenaline)	Dental cartridge: 2% (hydrochloride) + epinephrine 1:80 000. Injection: 1%; 2% (hydrochloride or sulfate) + epinephrine 1:200 000 in vial.
<i>Complementary List</i>	
ephedrine	Injection: 30 mg/mL (hydrochloride) in 1 mL ampoule. (For use in spinal anaesthesia during delivery, to prevent hypotension).
1.3 Preoperative medication and sedation for short-term procedures	
atropine	Injection: 1 mg (sulfate) in 1 mL ampoule.
<input type="checkbox"/> midazolam Therapeutic alternatives to be reviewed	Injection: 1 mg/mL. Oral liquid: 2 mg/mL [c]. Tablet: 7.5 mg; 15 mg.
morphine	Injection: 10 mg (sulfate or hydrochloride) in 1 mL ampoule.

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1.4 Medical gases	
oxygen*	Inhalation For use in the management of hypoxaemia. *No more than 30% oxygen should be used to initiate resuscitation of neonates less than or equal to 32 weeks of gestation.
2. MEDICINES FOR PAIN AND PALLIATIVE CARE	
2.1 Non-opioids and non-steroidal anti-inflammatory medicines (NSAIDs)	
acetylsalicylic acid	Suppository: 50 mg to 150 mg. Tablet: 100 mg to 500 mg.
ibuprofen ^a	Oral liquid: 100 mg/5 mL [c], 200 mg/5 mL. Tablet: 200 mg; 400 mg; 600 mg. ^a Not in children less than 3 months.
paracetamol (acetaminophen)*	Oral liquid: 120 mg/5 mL or 125 mg/5 mL **, 250 mg/5 mL [c]. **The presence of both 120 mg/5 mL and 125 mg/5 mL strengths on the same market would cause confusion in prescribing and dispensing and should be avoided. Suppository: 100 mg, 250 mg [c]. Tablet: 250 mg, 325 mg, 500 mg. Tablet (dispersible): 100 mg, 250 mg [c]. *Not recommended for anti-inflammatory use due to lack of proven benefit to that effect.
2.2 Opioid analgesics	
codeine	Tablet: 30 mg (phosphate).
fentanyl*	Transdermal patch: 12 micrograms/hr; 25 micrograms/hr; 50 micrograms/hr; 75 micrograms/hr; 100 micrograms/hr. *For the management of cancer pain
<input type="checkbox"/> morphine Therapeutic alternatives: - hydromorphone - oxycodone	Granules (slow release; to mix with water): 20 mg to 200 mg (morphine sulfate). Injection: 10 mg (morphine hydrochloride or morphine sulfate) in 1 mL ampoule. Oral liquid: 10 mg/5 mL (morphine hydrochloride or morphine sulfate). Tablet (slow release): 10 mg to 200mg (morphine hydrochloride or morphine sulfate). Tablet (immediate release): 10 mg (morphine sulfate).
<i>Complementary list</i>	
methadone*	Tablet: 5 mg; 10 mg (hydrochloride) Oral liquid: 5 mg/5 mL; 10 mg/5 mL (hydrochloride) Concentrate for oral liquid: 5 mg/mL; 10 mg/mL (hydrochloride) *For the management of cancer pain.

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2.3 Medicines for other common symptoms in palliative care	
amitriptyline	Tablet: 10 mg; 25 mg; 75 mg.
cyclizine [c]	Injection: 50 mg/mL. Tablet: 50 mg.
dexamethasone	Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule. Oral liquid: 2 mg/5 mL. Tablet: 2 mg [c]; 4 mg.
diazepam	Injection: 5 mg/mL. Oral liquid: 2 mg/5 mL. Rectal gel: 5 mg/mL in 0.5 mL, 2 mL, 4 mL rectal delivery system. Rectal solution: 2 mg/mL in 1.25 mL, 2.5 mL rectal tube; 4 mg/mL in 2.5 mL rectal tube. Tablet: 5 mg; 10 mg.
docosate sodium	Capsule: 100 mg. Oral liquid: 50 mg/5 mL.
fluoxetine	Solid oral dosage form: 20 mg (as hydrochloride).
haloperidol	Injection: 5 mg in 1 mL ampoule. Oral liquid: 2 mg/mL. Solid oral dosage form: 0.5 mg; 2mg; 5 mg.
hyoscine butylbromide	Injection: 20 mg/mL.
hyoscine hydrobromide [c]	Injection: 400 micrograms/mL; 600 micrograms/mL. Transdermal patches: 1 mg/72 hours.
lactulose [c]	Oral liquid: 3.1 to 3.7 g/5 mL.
loperamide	Solid oral dosage form: 2 mg.
metoclopramide	Injection: 5 mg/mL (hydrochloride) in 2 mL ampoule. Oral liquid: 5 mg/5 mL. Solid oral form: 10 mg (hydrochloride).
midazolam	Injection: 1 mg/mL; 5 mg/mL. Oral liquid: 2mg/mL [c]. Solid oral dosage form: 7.5 mg; 15 mg.
□ ondansetron a Therapeutic alternatives: - dolasetron - granisetron - palonosetron - tropisetron	Injection: 2 mg base/mL in 2 mL ampoule (as hydrochloride). Oral liquid: 4 mg base/5 mL. Solid oral dosage form: Eq 4 mg base; Eq 8 mg base. a > 1 month.
senna	Oral liquid: 7.5 mg/5 mL.

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3. ANTIALLERGICS AND MEDICINES USED IN ANAPHYLAXIS	
dexamethasone	Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.
epinephrine (adrenaline)	Injection: 1 mg/mL (as hydrochloride or hydrogen tartrate) in 1 mL ampoule.
hydrocortisone	Powder for injection: 100 mg (as sodium succinate) in vial.
<input type="checkbox"/> loratadine*	Oral liquid: 1 mg/mL. Tablet: 10 mg. <i>*There may be a role for sedating antihistamines for limited indications (EMC).</i>
<input type="checkbox"/> prednisolone	Oral liquid: 5 mg/mL [c]. Tablet: 5 mg; 25 mg.
4. ANTIDOTES AND OTHER SUBSTANCES USED IN POISONINGS	
4.1 Non-specific	
charcoal, activated	Powder.
4.2 Specific	
acetylcysteine	Injection: 200 mg/mL in 10 mL ampoule. Oral liquid: 10% [c]; 20% [c].
atropine	Injection: 1 mg (sulfate) in 1 mL ampoule.
calcium gluconate	Injection: 100 mg/mL in 10 mL ampoule.
methylthioninium chloride (methylene blue)	Injection: 10 mg/mL in 10 mL ampoule.
naloxone	Injection: 400 micrograms (hydrochloride) in 1 mL ampoule.
penicillamine	Solid oral dosage form: 250 mg.
potassium ferric hexacyano-ferrate(II) -2H ₂ O (Prussian blue)	Powder for oral administration.
sodium nitrite	Injection: 30 mg/mL in 10 mL ampoule.
sodium thiosulfate	Injection: 250 mg/mL in 50 mL ampoule.
<i>Complementary List</i>	
deferoxamine	Powder for injection: 500 mg (mesilate) in vial.
dimercaprol	Injection in oil: 50 mg/mL in 2 mL ampoule.
fomepizole	Injection: 5 mg/mL (sulfate) in 20 mL ampoule or 1 g/mL (base) in 1.5 mL ampoule.
sodium calcium edetate	Injection: 200 mg/mL in 5 mL ampoule.
succimer	Solid oral dosage form: 100 mg.

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5. MEDICINES FOR DISEASES OF THE NERVOUS SYSTEM	
5.1 Antiseizure medicines	
carbamazepine	<p>Oral liquid: 100 mg/5 mL.</p> <p>Tablet (chewable): 100 mg; 200 mg.</p> <p>Tablet (scored): 100 mg; 200 mg; 400 mg.</p>
diazepam	<p>Rectal gel: 5 mg/mL in 0.5 mL, 2 mL, 4 mL rectal delivery system.</p> <p>Rectal solution: 2 mg/mL in 1.25 mL, 2.5 mL rectal tube; 4 mg/mL in 2.5 mL rectal tube.</p>
lamotrigine*	<p>Tablet: 25 mg; 50 mg; 100 mg; 200 mg.</p> <p>Tablet (chewable, dispersible): 2 mg; 5 mg; 25 mg; 50 mg; 100 mg; 200 mg.</p> <p>*For use as adjunctive therapy for treatment-resistant partial or generalized seizures.</p>
levetiracetam	<p>Oral solution: 100 mg/mL</p> <p>Tablet: 250 mg; 500 mg; 750 mg; 1000 mg.</p>
<input type="checkbox"/> lorazepam Therapeutic alternatives: - diazepam (injection) - midazolam (injection)	<p>Injection: 2 mg/mL in 1 mL ampoule; 4 mg/mL in 1 mL ampoule.</p>
magnesium sulfate*	<p>Injection: 0.5 g/mL in 2 mL ampoule (equivalent to 1 g in 2 mL; 50% weight/volume); 0.5 g/mL in 10 mL ampoule (equivalent to 5 g in 10 mL; 50% weight/volume).</p> <p>*For use in eclampsia and severe pre-eclampsia and not for other convulsant disorders.</p>
midazolam	<p>Solution for oromucosal administration: 5 mg/mL in 0.5 mL, 1 mL, 1.5 mL, 2 mL pre-filled syringe; 10 mg/mL in 0.25 mL, 0.5 mL, 0.75 mL, 1 mL pre-filled syringe.</p> <p>Injection*: 1 mg/mL in 5 mL vial; 5 mg/mL in 1 mL or 3 mL vial.</p> <p>*For buccal administration when solution for oromucosal administration is not available.</p>
phenobarbital	<p>Injection: 30 mg/mL or 60 mg/mL [c], 200 mg/mL (sodium).</p> <p>Oral liquid: 15 mg/5 mL.</p> <p>Tablet: 15 mg to 100 mg.</p>
phenytoin	<p>Injection: 50 mg/mL (phenytoin sodium).</p> <p>Oral liquid: 30 mg/5 mL (phenytoin).</p> <p>Solid oral dosage form: 25 mg; 50 mg; 100 mg (phenytoin sodium).</p> <p>Tablet (chewable): 50 mg (phenytoin).</p>
valproic acid (sodium valproate)* <i>*Avoid use in pregnancy and in women and girls of child-bearing potential, unless alternative treatments are ineffective or not tolerated because of the high risk of birth defects and developmental disorders in children exposed to valproate in the womb.</i>	<p>Oral liquid: 200 mg/5 mL.</p> <p>Tablet (crushable): 100 mg.</p> <p>Tablet (enteric-coated): 200 mg; 500 mg.</p>

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Complementary List	
ethosuximide	Capsule: 250 mg. Oral liquid: 250 mg/5 mL.
levetiracetam	Concentrate solution for infusion: 500 mg/5mL in 5 mL vial. Solution for infusion: 5 mg/mL; 10 mg/mL; 15 mg/mL in 100 mL bag.
valproic acid (sodium valproate)* *Avoid use in pregnancy and in women and girls of child-bearing potential, unless alternative treatments are ineffective or not tolerated because of the high risk of birth defects and developmental disorders in children exposed to valproate in the womb.	Injection: 100 mg/mL in 3 mL, 4 mL, 10 mL ampoule.
5.2 Medicines for multiple sclerosis	
Complementary List	
cladribine	Tablet: 10 mg.
glatiramer acetate	Injection (subcutaneous): 20 mg/mL; 40 mg/mL in pre-filled syringe.
rituximab* *including quality-assured biosimilars	Injection (intravenous): 500 mg/50 mL in 50 mL vial.
5.3 Medicines for parkinsonism	
<input type="checkbox"/> biperiden Therapeutic alternatives: – trihexyphenidyl	Injection: 5 mg (lactate) in 1 mL ampoule. Tablet: 2 mg (hydrochloride).
levodopa + <input type="checkbox"/> carbidopa Therapeutic alternatives: – benserazide (for carbidopa)	Tablet: 100 mg + 10 mg; 100 mg + 25 mg; 250 mg + 25 mg.

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6. ANTI-INFECTIVE MEDICINES	
6.1 Anthelmintics	
6.1.1 <i>Intestinal anthelmintics</i>	
albendazole	Tablet (chewable, scored): 400 mg.
ivermectin	Tablet: 3 mg.
levamisole	Tablet: 50 mg; 150 mg (as hydrochloride).
mebendazole	Tablet (chewable): 100 mg; 500 mg.
niclosamide	Tablet (chewable): 500 mg.
praziquantel	Tablet: 150 mg, 500 mg Tablet (scored): 600 mg.
pyrantel	Tablet (chewable): 250 mg (as embonate or pamoate).
6.1.2 <i>Antifilarials</i>	
albendazole	Tablet (chewable, scored): 400 mg.
diethylcarbamazine	Tablet: 50 mg; 100 mg (dihydrogen citrate).
ivermectin	Tablet: 3 mg.
6.1.3 <i>Antischistosomal and other antitrematode medicines</i>	
praziquantel	Tablet: 150 mg, 500 mg. Tablet (scored): 600 mg.
triclabendazole	Tablet (scored): 250 mg.
<i>Complementary List</i>	
oxamniquine*	Capsule: 250 mg. Oral liquid: 250 mg/5 mL. <i>*For use when praziquantel treatment fails.</i>
6.1.4 <i>Cysticidal medicines</i>	
<i>Complementary List</i>	
albendazole	Tablet (chewable): 200 mg [c]. Tablet (chewable, scored): 400 mg.
mebendazole	Tablet (chewable): 100 mg [c], 500 mg.
praziquantel	Tablet: 150 mg, 500 mg. Tablet (scored): 600 mg.

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6.2 Antibacterials

To assist in the development of tools for antibiotic stewardship at local, national and global levels and to reduce antimicrobial resistance, the Access, Watch, Reserve (AWaRe) classification of antibiotics was developed – where antibiotics are classified into different groups to emphasize the importance of their appropriate use.

ACCESS GROUP ANTIBIOTICS

This group includes antibiotics that have activity against a wide range of commonly encountered susceptible pathogens while also showing lower resistance potential than antibiotics in the other groups. Selected Access group antibiotics are recommended as essential first or second choice empiric treatment options for infectious syndromes reviewed by the EML Expert Committee and are listed as individual medicines on the Model Lists to improve access and promote appropriate use. They are essential antibiotics that should be widely available, affordable and quality assured.

WATCH GROUP ANTIBIOTICS

This group includes antibiotic classes that have higher resistance potential and includes most of the highest priority agents among the [Critically Important Antimicrobials for Human Medicine](#) and/or antibiotics that are at relatively high risk of selection of bacterial resistance. These medicines should be prioritized as key targets of stewardship programs and monitoring. Selected Watch group antibiotics are recommended as essential first or second choice empiric treatment options for a limited number of specific infectious syndromes and are listed as individual medicines on the Model Lists.

RESERVE GROUP ANTIBIOTICS

This group includes antibiotics and antibiotic classes that should be reserved for treatment of confirmed or suspected infections due to multi-drug-resistant organisms. Reserve group antibiotics should be treated as “last resort” options. Selected Reserve group antibiotics are listed as individual medicines on the Model Lists when they have a favourable risk-benefit profile and proven activity against “Critical Priority” or “High Priority” pathogens identified by the [WHO Priority Pathogens List](#), notably carbapenem resistant *Enterobacteriaceae*. These antibiotics should be accessible, but their use should be tailored to highly specific patients and settings, when all alternatives have failed or are not suitable. These medicines could be protected and prioritized as key targets of national and international stewardship programs involving monitoring and utilization reporting, to preserve their effectiveness.

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6.2.1 Access group antibiotics

	Injection: 50 mg/mL (as sulfate) [c]; 250 mg/mL (as sulfate) in 2 mL vial.	
amikacin	FIRST CHOICE <ul style="list-style-type: none"> – <i>High-risk febrile neutropenia</i> – <i>Pyelonephritis or prostatitis (severe)</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Sepsis in neonates and children</i> [c]
	Powder for injection: 250 mg; 500 mg; 1 g (as sodium) in vial. Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL (as trihydrate) [c]. Solid oral dosage form: 250 mg; 500 mg; 1g (as trihydrate). Tablet (dispersible, scored): 250 mg; 500 mg (as trihydrate) [c].	
amoxicillin	FIRST CHOICE <ul style="list-style-type: none"> – <i>Community acquired pneumonia (mild to moderate)</i> – <i>Community acquired pneumonia (severe)</i> [c] – <i>Complicated severe acute malnutrition</i> [c] – <i>Exacerbations of COPD</i> – <i>Otitis media</i> – <i>Pharyngitis</i> – <i>Progressive apical dental abscess</i> – <i>Sepsis in neonates and children</i> [c] – <i>Sinusitis</i> – <i>Uncomplicated severe acute malnutrition</i> [c] 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute bacterial meningitis</i>
amoxicillin + clavulanic acid	Powder for injection: 500 mg (as sodium) + 100 mg (as potassium salt); 1000 mg (as sodium) + 200 mg (as potassium salt) in vial. Powder for oral liquid: 125 mg (as trihydrate)+ 31.25 mg (as potassium salt)/5 mL; 250 mg (as trihydrate) + 62.5 mg (as potassium salt)/5mL [c]. Tablet: 500 mg (as trihydrate) + 125 mg (as potassium salt); 875 mg (as trihydrate) + 125 mg (as potassium salt). Tablet (dispersible): 200 mg (as trihydrate) + 28.5 mg (as potassium salt) [c]; 250 mg (as trihydrate) + 62.5 mg (as potassium salt) [c].	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Community acquired pneumonia (severe)</i> [c] – <i>Complicated intraabdominal infections (mild to moderate)</i> – <i>Exacerbations of COPD</i> – <i>Hospital acquired pneumonia</i> – <i>Low-risk febrile neutropenia</i> – <i>Lower urinary tract infections</i> – <i>Sinusitis</i> – <i>Skin and soft tissue infections</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Bone and joint infections</i> – <i>Community-acquired pneumonia (mild to moderate)</i> – <i>Community acquired pneumonia (severe)</i> – <i>Otitis media</i> – <i>Surgical prophylaxis</i>

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	Powder for injection: 500 mg; 1 g (as sodium) in vial.	
ampicillin	FIRST CHOICE <ul style="list-style-type: none"> – <i>Community acquired pneumonia (severe) [c]</i> – <i>Complicated intraabdominal infections [c]</i> – <i>Complicated severe acute malnutrition [c]</i> – <i>Sepsis in neonates and children [c]</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute bacterial meningitis</i>
benzathine benzylpenicillin	Powder for injection: 1.2 million IU (\approx 900 mg) in vial [c]; 2.4 million IU (\approx 1.8 g) in vial.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Syphilis</i> 	SECOND CHOICE
benzylpenicillin	Powder for injection: 600 mg (= 1 million IU); 3 g (= 5 million IU) (sodium or potassium salt) in vial.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Community acquired pneumonia (severe) [c]</i> – <i>Complicated severe acute malnutrition [c]</i> – <i>Sepsis in neonates and children [c]</i> – <i>Syphilis</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute bacterial meningitis</i>
cefalexin	Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL (anhydrous). Solid oral dosage form: 250 mg; 500 mg (as monohydrate). Tablet (dispersible): 125 mg [c]; 250 mg [c].	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Skin and soft tissue infections</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Exacerbations of COPD</i> – <i>Pharyngitis</i>
cefazolin ^a	Powder for injection: 1 g (as sodium salt) in vial. a > 1 month.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Surgical prophylaxis</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Bone and joint infections</i>
chloramphenicol	Oily suspension for injection* : 0.5 g/mL (as sodium succinate) in 2 mL ampoule. *Only for the presumptive treatment of epidemic meningitis in children older than 2 years and in adults. Powder for injection: 1 g (as sodium succinate) in vial.	
	FIRST CHOICE	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute bacterial meningitis</i>

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clindamycin	<p>Capsule: 150 mg (as hydrochloride).</p> <p>Injection: 150 mg/mL (as phosphate); 600 mg/4 mL (as phosphate); 900 mg/6 mL (as phosphate).</p> <p>Powder for oral liquid: 75 mg/5 mL (as palmitate hydrochloride) [c].</p>	
	FIRST CHOICE – <i>Necrotizing fasciitis</i>	SECOND CHOICE – <i>Bone and joint infections</i>
<input checked="" type="checkbox"/> cloxacillin* Therapeutic alternatives: - 4 th level ATC chemical subgroup (J01CF Beta-lactamase resistant penicillins)	<p>Capsule: 250 mg [c], 500 mg; 1 g (as sodium).</p> <p>Powder for injection: 250 mg [c], 500 mg (as sodium) in vial.</p> <p>Powder for oral liquid: 125 mg/5 mL, 250 mg/5 mL (as sodium) [c].</p> <p>*cloxacillin, dicloxacillin and flucloxacillin are preferred for oral administration due to better bioavailability.</p>	
	FIRST CHOICE – <i>Bone and joint infections</i> – <i>Skin and soft tissue infections</i>	SECOND CHOICE – <i>Sepsis in neonates and children</i> [c]
doxycycline a	<p>Oral liquid: 50 mg/5 mL (calcium) [c].</p> <p>Powder for oral liquid: 25 mg/5 mL (monohydrate) [c].</p> <p>Powder for injection: 100 mg in vial.</p> <p>Solid oral dosage form: 50 mg [c]; 100 mg (as hyclate).</p> <p>Tablet (dispersible): 100 mg (as monohydrate) [c].</p> <p>a Use in children <8 years only for life-threatening infections when no alternative exists.</p>	
	FIRST CHOICE – <i>Cholera</i> – <i>Sexually transmitted infection due to Chlamydia trachomatis</i>	SECOND CHOICE – <i>Cholera</i> [c] – <i>Community acquired pneumonia (mild to moderate)</i> – <i>Exacerbations of COPD</i>
gentamicin	<p>Injection: 10 mg/mL (as sulfate); 40 mg/mL (as sulfate) in 2 mL vial.</p>	
	FIRST CHOICE – <i>Acute bacterial meningitis in neonates</i> [c] – <i>Community acquired pneumonia (severe)</i> [c] – <i>Complicated intraabdominal infections</i> [c] – <i>Complicated severe acute malnutrition</i> [c] – <i>Sepsis in neonates and children</i> [c]	SECOND CHOICE – <i>Gonorrhoea</i> – <i>Surgical prophylaxis</i>

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	Injection: 500 mg in 100 mL vial. Oral liquid: 200 mg/5 mL (as benzoate). Suppository: 500 mg; 1 g. Tablet: 200 mg; 250 mg; 400 mg; 500 mg.	
metronidazole	FIRST CHOICE <ul style="list-style-type: none"> – <i>C. difficile infection</i> – <i>Complicated intraabdominal infections (mild to moderate)</i> – <i>Complicated intrabdominal infections (severe)</i> – <i>Necrotizing fasciitis</i> – <i>Surgical prophylaxis</i> – <i>Trichomoniasis</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Complicated intraabdominal infections (mild to moderate)</i>
	Oral liquid: 25 mg/5 mL [c]. Solid oral dosage form: 50 mg [c]; 100 mg.	
nitrofurantoin	FIRST CHOICE <ul style="list-style-type: none"> – <i>Lower urinary tract infections</i> 	SECOND CHOICE
	Powder for oral liquid: 250 mg/5 mL (as potassium). Solid oral dosage form: 250 mg; 500 mg (as potassium).	
phenoxymethylenicillin	FIRST CHOICE <ul style="list-style-type: none"> – <i>Community acquired pneumonia (mild to moderate)</i> – <i>Pharyngitis</i> – <i>Progressive apical dental abscess</i> 	SECOND CHOICE
procaine benzylpenicillin*	Powder for injection: 1 g (=1 million IU); 3 g (=3 million IU) in vial. *Procaine benzylpenicillin is not recommended as first-line treatment for neonatal sepsis except in settings with high neonatal mortality, when given by trained health workers in cases where hospital care is not achievable.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Syphilis (congenital)</i> [c] 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Syphilis</i>
	Powder for injection: 2 g (as hydrochloride) in vial.	
spectinomycin	FIRST CHOICE	SECOND CHOICE <ul style="list-style-type: none"> – <i>Gonorrhoea</i>
	Injection: 80 mg + 16 mg/mL in 5 mL ampoule; 80 mg + 16 mg/mL in 10 mL ampoule. Oral liquid: 200 mg + 40 mg/5 mL. Tablet: 100 mg + 20 mg; 400 mg + 80 mg; 800 mg + 160 mg. Tablet (dispersible): 100 mg + 20 mg [c].	
sulfamethoxazole + trimethoprim	FIRST CHOICE <ul style="list-style-type: none"> – <i>Lower urinary tract infections</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute invasive diarrhoea / bacterial dysentery</i>

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trimethoprim	Tablet: 100 mg; 200 mg. Oral liquid: 50 mg/5 mL [c].	
	FIRST CHOICE – <i>Lower urinary tract infections</i>	SECOND CHOICE
6.2.2 Watch group antibiotics		
azithromycin	Solid oral dosage form: 250 mg; 500 mg (anhydrous). Powder for oral liquid: 200 mg/5 mL (anhydrous) [c].	
	FIRST CHOICE – <i>Cholera</i> – <i>Enteric fever</i> – <i>Gonorrhoea</i> – <i>Sexually transmitted infection due to Chlamydia trachomatis</i> – <i>Trachoma</i> – <i>Yaws</i>	SECOND CHOICE – <i>Acute invasive bacterial diarrhoea / dysentery</i> – <i>Gonorrhoea</i>
cefixime	Powder for oral liquid: 100 mg/5 mL [c]. Solid oral dosage form: 200 mg; 400 mg (as trihydrate).	
	FIRST CHOICE	SECOND CHOICE – <i>Acute invasive bacterial diarrhoea / dysentery</i> – <i>Gonorrhoea</i>
cefotaxime*	Powder for injection: 250 mg; 500 mg; 1 g; 2 g (as sodium) in vial. *3rd generation cephalosporin of choice for use in hospitalized neonates.	
	FIRST CHOICE – <i>Acute bacterial meningitis</i> – <i>Community acquired pneumonia (severe)</i> – <i>Complicated intraabdominal infections (mild to moderate)</i> – <i>Complicated intraabdominal infections (severe)</i> – <i>Hospital acquired pneumonia</i> – <i>Pyelonephritis or prostatitis (severe)</i>	SECOND CHOICE – <i>Bone and joint infections</i> – <i>Pyelonephritis or prostatitis (mild to moderate)</i> – <i>Sepsis in neonates and children [c]</i>

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ceftriaxone* [a]	<p>Powder for injection: 250 mg; 500 mg; 1 g; 2 g (as sodium) in vial.</p> <p>*Do not administer with calcium and avoid in infants with hyperbilirubinaemia.</p> <p>[a] > 41 weeks corrected gestational age.</p>	
	FIRST CHOICE <ul style="list-style-type: none"> – Acute bacterial meningitis – Community acquired pneumonia (severe) – Complicated intraabdominal infections (mild to moderate) – Complicated intrabdominal infections (severe) – Endophthalmitis – Enteric fever – Gonorrhoea – Hospital acquired pneumonia – Necrotizing fasciitis – Pyelonephritis or prostatitis (severe) 	SECOND CHOICE <ul style="list-style-type: none"> – Acute invasive bacterial diarrhoea / dysentery – Bone and joint infections – Pyelonephritis or prostatitis (mild to moderate) – Sepsis in neonates and children [c]
cefuroxime	<p>Powder for injection: 250 mg; 750 mg; 1.5 g (as sodium) in vial.</p>	
	FIRST CHOICE	SECOND CHOICE <ul style="list-style-type: none"> – Surgical prophylaxis
ciprofloxacin	<p>Oral liquid: 250 mg/5 mL (anhydrous) [c].</p> <p>Solution for IV infusion: 2 mg/mL (as hydrate) [c].</p> <p>Solid oral dosage form: 100 mg [c]; 250 mg; 500 mg (as hydrochloride).</p>	
	FIRST CHOICE <ul style="list-style-type: none"> – Acute invasive bacterial diarrhoea / dysentery – Enteric fever – Low-risk febrile neutropenia – Pyelonephritis or prostatitis (mild to moderate) 	SECOND CHOICE <ul style="list-style-type: none"> – Cholera – Complicated intraabdominal infections (mild to moderate)
□ clarithromycin† Therapeutic alternatives: - erythromycin*	<p>Powder for oral liquid: 125 mg/5 mL; 250 mg/5 mL.</p> <p>Powder for injection: 500 mg in vial.</p> <p>Solid oral dosage form: 250 mg [c]; 500 mg.</p> <p>†clarithromycin is also listed for use in combination regimens for eradication of <i>H. pylori</i> in adults.</p>	
*as second choice treatment for pharyngitis in children (EMC only)	FIRST CHOICE <p>Community acquired pneumonia (severe)</p>	SECOND CHOICE <ul style="list-style-type: none"> – Pharyngitis

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piperacillin + tazobactam	Powder for injection: 2 g (as sodium) + 250 mg (as sodium); 4 g (as sodium) + 500 mg (as sodium) in vial.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Complicated intraabdominal infections (severe)</i> – <i>High-risk febrile neutropenia</i> – <i>Hospital acquired pneumonia</i> – <i>Necrotizing fasciitis</i> 	SECOND CHOICE
vancomycin*	Capsule: 125 mg; 250 mg (as hydrochloride). *vancomycin powder for injection may also be used for oral administration	
	FIRST CHOICE	SECOND CHOICE <ul style="list-style-type: none"> – <i>C. difficile infection</i>
Complementary List		
ceftazidime	Powder for injection: 250 mg; 1 g (as pentahydrate) in vial.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Endophthalmitis</i> 	SECOND CHOICE
□ meropenem* [a] Therapeutic alternatives*: - imipenem + cilastatin *complicated intraabdominal infections and high-risk febrile neutropenia only. Meropenem is the preferred choice for acute bacterial meningitis in neonates.	Powder for injection: 500 mg (as trihydrate); 1 g (as trihydrate) in vial. [a] > 3 months.	
	FIRST CHOICE	SECOND CHOICE <ul style="list-style-type: none"> – <i>Acute bacterial meningitis in neonates [c]</i> – <i>Complicated intraabdominal infections (severe)</i> – <i>High-risk febrile neutropenia</i>
vancomycin	Powder for injection: 250 mg; 500 mg; 1 g (as hydrochloride) in vial.	
	FIRST CHOICE <ul style="list-style-type: none"> – <i>Endophthalmitis</i> – <i>Necrotizing fasciitis</i> 	SECOND CHOICE <ul style="list-style-type: none"> – <i>High-risk febrile neutropenia</i>
6.2.3 Reserve group antibiotics		
Complementary List		
cefiderocol	Powder for injection: 1 g (as sulfate toxylate) in vial.	
ceftazidime + avibactam	Powder for injection: 2 g + 0.5 g in vial.	
ceftolozane + tazobactam	Powder for injection: 1 g + 0.5 g in vial.	
colistin	Powder for injection: 1 million IU (as colistemethate sodium) (equivalent to 34 mg colistin base activity) in vial.	
fosfomycin	Powder for injection: 2 g; 4 g (as sodium) in vial.	
o linezolid Therapeutic alternatives: - tedizolid phosphate	Injection for intravenous administration: 2 mg/mL in 300 mL bag.	
	Powder for oral liquid: 100 mg/5 mL.	
	Tablet: 600 mg.	
	Tablet (dispersible): 150 mg [c].	

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<i>meropenem + vaborbactam</i>	Powder for injection: 1 g (as trihydrate) + 1 g in vial.
<i>plazomicin</i>	Injection: 500 mg/10 mL.
<i>polymyxin B</i>	Powder for injection: 500 000 IU (equivalent to 50 mg polymyxin B base) in vial.
6.2.4 Antileprosy medicines	
Medicines used in the treatment of leprosy should never be used except in combination. Combination therapy is essential to prevent the emergence of drug resistance. Colour-coded blister packs (MDT blister packs) containing standard two-medicine (paucibacillary leprosy) or three-medicine (multibacillary leprosy) combinations for adult and childhood leprosy should be used. MDT blister packs can be supplied free of charge through WHO.	
<i>clofazimine</i>	Solid oral dosage form: 50 mg; 100 mg.
<i>dapsone</i>	Tablet: 25 mg; 50 mg; 100 mg.
<i>rifampicin</i>	Oral liquid: 20 mg/mL [c]. Solid oral dosage form: 150 mg; 300 mg.
6.2.5 Antituberculosis medicines	
WHO recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality.	
<i>ethambutol</i>	Tablet: 100 mg; 400 mg (hydrochloride). Tablet (dispersible): 100 mg [c]
<i>ethambutol + isoniazid + pyrazinamide + rifampicin</i>	Tablet: 275 mg + 75 mg + 400 mg + 150 mg.
<i>ethambutol + isoniazid + rifampicin</i>	Tablet: 275 mg + 75 mg + 150 mg.
<i>ethionamide</i>	Tablet: 250 mg. Tablet (dispersible): 125 mg [c].
<i>isoniazid</i>	Tablet: 100 mg; 300 mg. Tablet (dispersible): 100 mg [c].
<i>isoniazid + pyrazinamide + rifampicin</i>	Tablet (dispersible): 50 mg + 150 mg + 75 mg [c].
<i>isoniazid + rifampicin</i>	Tablet: 75 mg + 150 mg; 150 mg + 300 mg. Tablet (dispersible): 50 mg + 75 mg [c].
<i>isoniazid + rifapentine</i>	Tablet (scored): 300 mg + 300 mg.
<i>moxifloxacin</i>	Tablet: 400 mg.
<i>pyrazinamide</i>	Tablet: 400 mg; 500 mg Tablet (dispersible): 150 mg.
<i>rifabutin</i>	Solid oral dosage form: 150 mg.* *For use only in patients with HIV receiving protease inhibitors.
<i>rifampicin</i>	Oral liquid: 20 mg/mL [c]. Solid oral dosage form: 150 mg; 300 mg.
<i>rifapentine</i>	Tablet: 150 mg; 300 mg.

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Complementary List	
Medicines for the treatment of multidrug-resistant tuberculosis (MDR-TB) should be used in specialized centres adhering to WHO standards for TB control.	
amikacin	Injection: 250 mg/mL (as sulfate) in 2 mL vial.
amoxicillin + clavulanic acid*	Powder for oral liquid: 250 mg (as trihydrate) + 62.5 mg (as potassium salt)/5mL [c]. Tablet: 500 mg (as trihydrate) + 125 mg (as potassium salt). *For use only in combination with meropenem or imipenem+cilastatin.
bedaquiline	Tablet: 20 mg [c]; 100 mg.
clofazimine	Solid oral dosage form: 50 mg; 100 mg.
<input checked="" type="checkbox"/> cycloserine Therapeutic alternatives: - terizidone	Solid oral dosage form: 125 mg [c]; 250 mg.
delamanid	Tablet (dispersible): 25 mg [c]. Tablet: 50 mg.
<input checked="" type="checkbox"/> ethionamide Therapeutic alternatives: - prontonamide	Tablet: 250 mg. Tablet (dispersible): 125 mg [c].
levofloxacin	Tablet: 250mg; 500 mg; 750 mg. Tablet (dispersible): 100 mg [c].
linezolid	Tablet: 600 mg. Tablet (dispersible): 150 mg [c].
<input checked="" type="checkbox"/> meropenem Therapeutic alternatives: - imipenem + cilastatin	Powder for injection: 500 mg (as trihydrate); 1 g (as trihydrate) in vial.
moxifloxacin	Tablet: 400 mg. Tablet (dispersible): 100 mg [c].
p-aminosalicylate sodium	Powder for oral solution: 5.52 g in sachet (equivalent to 4 g p-aminosalicylic acid).
pretomanid	Tablet: 200 mg.
streptomycin [c]	Powder for injection: 1 g (as sulfate) in vial.

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6.3 Antifungal medicines	
amphotericin B*	<p>Powder for injection: 50 mg (liposomal complex) in vial.</p> <p>Powder for injection: 50 mg (as sodium deoxycholate) in vial</p> <p>*Liposomal amphotericin B has a better safety profile than the sodium deoxycholate formulation and should be prioritized for selection and use depending on local availability and cost.</p>
clotrimazole	<p>Vaginal cream: 1%; 10%.</p> <p>Vaginal tablet: 100 mg; 500 mg.</p>
fluconazole	<p>Capsule: 50 mg.</p> <p>Injection: 2 mg/mL in vial.</p> <p>Oral liquid: 50 mg/5 mL.</p> <p>Powder for oral liquid: 50 mg/5 mL [c].</p>
flucytosine	<p>Capsule: 250 mg.</p> <p>Infusion: 2.5 g in 250 mL.</p>
griseofulvin	<p>Oral liquid: 125 mg/5 mL [c].</p> <p>Solid oral dosage form: 125 mg; 250 mg.</p>
itraconazole*	<p>Capsule: 100 mg.</p> <p>Oral liquid: 10 mg/mL.</p> <p>*For treatment of chronic pulmonary aspergillosis, histoplasmosis, sporotrichosis, paracoccidioidomycosis, mycoses caused by <i>T. marneffei</i> and chromoblastomycosis; and prophylaxis of histoplasmosis and infections caused by <i>T. marneffei</i> in AIDS patients.</p>
nystatin	<p>Lozenge: 100 000 IU.</p> <p>Oral liquid: 100 000 IU/mL [c].</p> <p>Pessary: 100 000 IU.</p> <p>Solid oral dosage form: 500 000 IU.</p>
voriconazole*	<p>Tablet: 50 mg; 200 mg</p> <p>Powder for injection: 200 mg in vial</p> <p>Powder for oral liquid: 40 mg/mL</p> <p>*For treatment of chronic pulmonary aspergillosis and acute invasive aspergillosis.</p>
<i>Complementary List</i>	
<input type="checkbox"/> <i>micafungin</i> <i>Therapeutic alternatives:</i> - <i>anidulafungin</i> - <i>caspofungin</i>	<i>Powder for injection:</i> 50 mg (as sodium); 100 mg (as sodium) in vial.
<i>potassium iodide</i>	<i>Saturated solution.</i>

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6.4 Antiviral medicines	
6.4.1 Antitherpes medicines	
□ aciclovir Therapeutic alternatives: - valaciclovir (oral)	Oral liquid: 200 mg/5 mL [c]. Powder for injection: 250 mg (as sodium salt) in vial. Tablet: 200 mg.
6.4.2 Antiretrovirals	
Based on current evidence and experience of use, medicines in the following classes of antiretrovirals are included as essential medicines for treatment and prevention of HIV (prevention of mother-to-child transmission, pre-exposure prophylaxis (where indicated) and post-exposure prophylaxis). WHO emphasizes the importance of using these products in accordance with global and national guidelines. WHO recommends and endorses the use of fixed-dose combinations and the development of appropriate new fixed-dose combinations, including modified dosage forms, non-refrigerated products and paediatric dosage forms of assured pharmaceutical quality.	
Scored tablets can be used in children and therefore can be considered for inclusion in the listing of tablets, provided that adequate quality products are available.	
6.4.2.1 Nucleoside/Nucleotide reverse transcriptase inhibitors	
abacavir	Tablet: 300 mg (as sulfate).
lamivudine	Oral liquid: 50 mg/5 mL [c]. Tablet: 150 mg.
tenofovir disoproxil fumarate†	Tablet: 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil). †also indicated for pre-exposure prophylaxis.
zidovudine	Capsule: 250 mg. Oral liquid: 50 mg/5 mL. Solution for IV infusion: 10 mg/mL in 20 mL vial. Tablet: 300 mg.
6.4.2.2 Non-nucleoside reverse transcriptase inhibitors	
efavirenz	Tablet: 600 mg.
nevirapine ^a	Oral liquid: 50 mg/5 mL. Tablet: 50 mg (dispersible); 200 mg. ^a > 6 weeks
6.4.2.3 Protease inhibitors	
Selection of protease inhibitor(s) from the Model List will need to be determined by each country after consideration of international and national treatment guidelines and experience. Ritonavir is recommended for use in combination as a pharmacological booster, and not as an antiretroviral in its own right. All other protease inhibitors should be used in boosted forms (e.g. with ritonavir).	
atazanavir + ritonavir	Tablet (heat stable): 300 mg (as sulfate) + 100 mg.
darunavir ^a	Tablet: 75 mg; 400 mg; 600 mg; 800 mg ^a > 3 years
lopinavir + ritonavir	Solid oral dosage form: 40 mg + 10 mg [c]. Tablet (heat stable): 100 mg + 25 mg; 200 mg + 50 mg.
ritonavir	Tablet (heat stable): 25 mg; 100 mg.

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6.4.2.4 Integrase inhibitors

dolutegravir ^a	<p>Tablet (dispersible, scored): 10 mg [c].</p> <p>[a] ≥ 4 weeks and ≥ 3 kg</p> <p>Tablet: 50 mg</p> <p>[a] ≥ 25 kg</p>
raltegravir*	<p>Granules for oral suspension: 100 mg in sachet.</p> <p>Tablet (chewable): 25 mg.</p> <p>Tablet: 400 mg.</p> <p>*For use in pregnant women and in second-line regimens in accordance with WHO treatment guidelines.</p>

6.4.2.5 Fixed-dose combinations of antiretroviral medicines

abacavir + lamivudine	Tablet (dispersible, scored): 120 mg (as sulfate) + 60 mg.
dolutegravir + lamivudine + tenofovir	Tablet: 50 mg + 300 mg + 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil)
efavirenz + <input type="checkbox"/> emtricitabine + tenofovir Therapeutic alternatives: - lamivudine (for emtricitabine)	Tablet: 600 mg + 200 mg + 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil).
efavirenz + lamivudine + tenofovir	Tablet: 400 mg + 300 mg + 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil)
<input type="checkbox"/> emtricitabine + tenofovir† Therapeutic alternatives: - lamivudine (for emtricitabine)	Tablet: 200 mg + 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil). † combination also indicated for pre-exposure prophylaxis
lamivudine + zidovudine	Tablet: 30 mg + 60 mg [c]; 150 mg + 300 mg.

6.4.2.6 Medicines for prevention of HIV-related opportunistic infections

isoniazid + pyridoxine + sulfamethoxazole + trimethoprim	Tablet (scored): 300 mg + 25 mg + 800 mg + 160 mg
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6.4.3 Other antivirals

ribavirin*	<p>Injection for intravenous administration: 800 mg and 1 g in 10 mL phosphate buffer solution.</p> <p>Solid oral dosage form: 200 mg; 400 mg; 600 mg.</p> <p>*For the treatment of viral haemorrhagic fevers</p>
valganciclovir*	<p>Tablet: 450 mg.</p> <p>*For the treatment of cytomegalovirus retinitis (CMVr).</p>

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<i>Complementary list</i>	
oseltamivir*	<p>Capsule: 30 mg; 45 mg; 75 mg (as phosphate).</p> <p>*Severe illness due to confirmed or suspected influenza virus infection in critically ill hospitalized patients</p>
valganciclovir*[c]	<p>Powder for oral solution: 50 mg/mL</p> <p>Tablet: 450 mg.</p> <p>*For the treatment of cytomegalovirus retinitis (CMVr).</p>
6.4.4 Antihepatitis medicines	
6.4.4.1 Medicines for hepatitis B	
6.4.4.1.1 Nucleoside/Nucleotide reverse transcriptase inhibitors	
entecavir	<p>Oral liquid: 0.05 mg/mL</p> <p>Tablet: 0.5 mg; 1 mg</p>
tenofovir disoproxil fumarate	Tablet: 300 mg (tenofovir disoproxil fumarate – equivalent to 245 mg tenofovir disoproxil).
6.4.4.2 Medicines for hepatitis C	
Pangenotypic direct-acting antivirals should be considered as therapeutic alternatives for the purposes of selection and procurement at national level.	
6.4.4.2.1 □ Pangenotypic direct-acting antiviral combinations	
daclatasvir*	<p>Tablet: 30 mg; 60 mg (as hydrochloride).</p> <p>*Pangenotypic when used in combination with sofosbuvir</p>
daclatasvir + sofosbuvir	Tablet: 60 mg + 400 mg.
glecaprevir + pibrentasvir	<p>Tablet: 100 mg + 40 mg.</p> <p>Granules: 50 mg + 20 mg in sachet [c].</p>
ravidasvir*	<p>Tablet: 200 mg.</p> <p>*Pangenotypic when used in combination with sofosbuvir</p>
sofosbuvir*	<p>Tablet: 200 mg; 400 mg.</p> <p>*Pangenotypic when used in combination with daclatasvir or ravidasvir</p>
sofosbuvir + velpatasvir	Tablet: 200 mg + 50 mg [c]; 400 mg + 100 mg.
6.4.4.2.2 Non-pangenotypic direct-acting antiviral combinations	
ledipasvir + sofosbuvir	Tablet: 90 mg + 400 mg.
6.4.4.2.3 Other antivirals for hepatitis C	
ribavirin*	<p>Injection for intravenous administration: 800 mg and 1 g in 10 mL phosphate buffer solution.</p> <p>Solid oral dosage form: 200 mg; 400 mg; 600 mg.</p> <p>*For the treatment of hepatitis C, in combination with direct acting anti-viral medicines</p>

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6.5 Antiprotozoal medicines	
6.5.1 Antiamoebic and antigiardiasis medicines	
diloxanide [a]	<p>Tablet: 500 mg (furoate).</p> <p>[a] > 25 kg.</p>
<input type="checkbox"/> metronidazole Therapeutic alternatives: - tinidazole	<p>Injection: 500 mg in 100 mL vial.</p> <p>Oral liquid: 200 mg/5 mL (as benzoate).</p> <p>Tablet: 200 mg; 250 mg; 400 mg; 500 mg.</p>
6.5.2 Antileishmaniasis medicines	
amphotericin B*	<p>Powder for injection: 50 mg (liposomal complex) in vial.</p> <p>Powder for injection: 50 mg (as sodium deoxycholate) in vial.</p> <p>*Liposomal amphotericin B has a better safety profile than the sodium deoxycholate formulation and should be prioritized for selection and use depending on local availability and cost.</p>
meglumine antimoniate	Injection: 1.5 g/5 mL in 5 mL ampoule.
miltefosine	Solid oral dosage form: 10 mg; 50 mg.
paromomycin	Solution for intramuscular injection: 750 mg of paromomycin base (as sulfate).
sodium stibogluconate	Injection: 100 mg/mL in 30 mL vial.
6.5.3 Antimalarial medicines	
6.5.3.1 For curative treatment	
Medicines for the treatment of <i>P. falciparum</i> malaria cases should be used in combination. The list currently recommends combinations according to treatment guidelines. WHO recognizes that not all of the fixed dose combinations (FDCs) in the WHO treatment guidelines exist, and encourages their development and rigorous testing. WHO also encourages development and testing of rectal dosage formulations.	
amodiaquine*	<p>Tablet: 153 mg or 200 mg (as hydrochloride).</p> <p>*To be used in combination with artesunate 50 mg.</p>
artemether*	<p>Oily injection: 80 mg/mL in 1 mL ampoule.</p> <p>*For use in the management of severe malaria.</p>
artemether + lumefantrine*	<p>Tablet: 20 mg + 120 mg.</p> <p>Tablet (dispersible): 20 mg + 120 mg [c].</p> <p>*Not recommended in the first trimester of pregnancy or in children below 5 kg.</p>

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artesunate*	<p>Injection: ampoules, containing 60 mg anhydrous artesunic acid with a separate ampoule of 5% sodium bicarbonate solution. For use in the management of severe malaria.</p> <p>Rectal dosage form: 50 mg [c]; 100 mg [c]; 200 mg capsules (for pre-referral treatment of severe malaria only; patients should be taken to an appropriate health facility for follow-up care) [c].</p> <p>Tablet: 50 mg.</p> <p>*To be used in combination with either amodiaquine, mefloquine or sulfadoxine + pyrimethamine.</p>
artesunate + amodiaquine*	<p>Tablet: 25 mg + 67.5 mg; 50 mg + 135 mg; 100 mg + 270 mg.</p> <p>*Other combinations that deliver the target doses required such as 153 mg or 200 mg (as hydrochloride) with 50 mg artesunate can be alternatives.</p>
artesunate + mefloquine	<p>Tablet: 25 mg + 55 mg; 100 mg + 220 mg.</p>
artesunate + pyronaridine tetraphosphate [a]	<p>Granules: 20 mg + 60 mg [c].</p> <p>Tablet: 60 mg + 180 mg.</p> <p>[a] > 5 kg</p>
chloroquine*	<p>Oral liquid: 50 mg/5 mL (as phosphate or sulfate).</p> <p>Tablet: 100 mg; 150 mg (as phosphate or sulfate).</p> <p>*For use only for the treatment of <i>Plasmodium vivax</i> infection.</p>
dihydroartemisinin + piperaquine phosphate [a]	<p>Tablet: 20 mg + 160 mg; 40 mg + 320 mg.</p> <p>[a] > 5 kg</p>
doxycycline*	<p>Capsule: 100 mg (as hydrochloride or hyclate).</p> <p>Tablet (dispersible): 100 mg (as monohydrate).</p> <p>*For use only in combination with quinine.</p>
mefloquine*	<p>Tablet: 250 mg (as hydrochloride).</p> <p>*To be used in combination with artesunate 50 mg.</p>
primaquine*	<p>Tablet: 7.5 mg; 15 mg (as diphosphate).</p> <p>*Only for use to achieve radical cure of <i>Plasmodium vivax</i> and <i>Plasmodium ovale</i> infections, given for 14 days.</p>
quinine*	<p>Injection: 300 mg/mL (hydrochloride) in 2 mL ampoule.</p> <p>Tablet: 300 mg (sulfate) or 300 mg (bisulfate).</p> <p>*For use only in the management of severe malaria and should be used in combination with doxycycline.</p>
sulfadoxine + pyrimethamine*	<p>Tablet: 500 mg + 25 mg.</p> <p>*Only in combination with artesunate 50 mg.</p>

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6.5.3.2 For chemoprevention

amodiaquine – sulfadoxine + pyrimethamine [c]	Co-packaged dispersible tablets: amodiaquine 76.5 mg (as hydrochloride) [3] and sulfadoxine + pyrimethamine 250 mg + 12.5 mg [1]; amodiaquine 153 mg (as hydrochloride) [3] and sulfadoxine + pyrimethamine 500 mg + 25 mg [1].
chloroquine*	Oral liquid: 50 mg/5 mL (as phosphate or sulfate). Tablet: 150 mg (as phosphate or sulfate). *For use only in central American regions, for <i>Plasmodium vivax</i> infections.
doxycycline [a]	Solid oral dosage form: 100 mg (as hydrochloride or hyclate). [a] > 8 years.
mefloquine [a]	Tablet: 250 mg (as hydrochloride). [a] > 5 kg or > 3 months.
proguanil*	Tablet: 100 mg (as hydrochloride). *For use only in combination with chloroquine.
sulfadoxine + pyrimethamine	Tablet: 250 mg + 12.5 mg [c]; 500 mg + 25 mg.

6.5.4 Antipneumocystosis and antitoxoplasmosis medicines

pyrimethamine	Tablet: 25 mg.
sulfadiazine	Tablet: 500 mg.
sulfamethoxazole + trimethoprim	Injection: 80 mg + 16 mg/mL in 5 mL ampoule; 80 mg + 16 mg/mL in 10 mL ampoule. Oral liquid: 200 mg + 40 mg/5 mL [c]. Tablet: 100 mg + 20 mg; 400 mg + 80 mg [c]; 800 mg + 160 mg. Tablet (dispersible): 100 mg + 20 mg [c].

Complementary List

pentamidine	Tablet: 200 mg; 300 mg (as isethionate).
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6.5.5 Antitrypanosomal medicines

6.5.5.1 African trypanosomiasis

fexinidazole*	Tablet: 600 mg *For the treatment of 1 st and 2 nd stage of human African trypanosomiasis due to <i>Trypanosoma brucei gambiense</i> infection.
Medicines for the treatment of 1st stage African trypanosomiasis	
pentamidine*	Powder for injection: 300 mg (as isetionate) in vial. *To be used for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
suramin sodium*	Powder for injection: 1 g in vial. *To be used for the treatment of the initial phase of <i>Trypanosoma brucei rhodesiense</i> infection.

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Medicines for the treatment of 2 nd stage African trypanosomiasis	
eflornithine*	Injection: 200 mg/mL (hydrochloride) in 50 mL bottle. *To be used for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
melarsoprol	Injection: 180 mg/5 mL in 5 mL ampoule (3.6% solution).
nifurtimox *	Tablet (scored): 30 mg; 120 mg. *Only to be used in combination with eflornithine, for the treatment of <i>Trypanosoma brucei gambiense</i> infection.
<i>Complementary List</i>	
melarsoprol [c]	Injection: 180 mg/5 mL in 5 mL ampoule (3.6% solution).
6.5.5.2 American trypanosomiasis	
benznidazole	Tablet: 12.5 mg [c] Tablet (scored): 50 mg; 100 mg.
nifurtimox	Tablet (scored): 30 mg; 120 mg.
6.6 Medicines for ectoparasitic infections	
ivermectin	Tablet: 3 mg
6.7 Medicines for Ebola virus disease	
ansuvimab	Powder for injection: 400 mg
atoltivimab + maftivimab + odesivimab	Injection: 241.7 mg + 241.7 mg + 241.7 mg in 14.5 mL vial
6.8 Medicines for COVID-19	
WHO recommends that effective and safe therapeutics for prevention and treatment of COVID-19 should be considered as essential medicines in the context of the public health emergency. WHO recommendations are revised and updated regularly in WHO living guidelines for therapeutics for the treatment and prevention of COVID-19.	
Selection of essential therapeutics for COVID-19 at the national level should be informed by recommendations in these guidelines, and consideration of the latest evidence, epidemiology and national priorities.	
The latest WHO Therapeutics and COVID-19: living guideline is available online at: https://app.magicapp.org/#/guideline/nBkO1E	
The latest WHO Drugs to prevent COVID-19: living guideline is available online at: https://app.magicapp.org/#/guideline/L6RxYL	

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7. ANTIMIGRAINE MEDICINES	
7.1 For treatment of acute attack	
acetylsalicylic acid	Tablet: 300 mg to 500 mg.
ibuprofen [c]	Oral liquid: 100 mg/5 mL [c]. Tablet: 200 mg; 400 mg.
paracetamol (acetaminophen)	Oral liquid: 120 mg/5 mL or 125 mg/5 mL*; 250 mg/5 mL [c]. *The presence of both 120 mg/5 mL and 125 mg/5mL strengths on the same market would cause confusion in prescribing and dispensing and should be avoided. Suppository: 250 mg [c]. Tablet: 250 mg; 325 mg; 500 mg. Tablet (dispersible): 100 mg, 250 mg [c].
sumatriptan	Tablet: 50 mg
7.2 For prophylaxis	
<input type="checkbox"/> propranolol Therapeutic alternatives to be reviewed	Tablet: 20 mg; 40 mg (hydrochloride).
8. IMMUNOMODULATORS AND ANTINEOPLASTICS	
8.1 Immunomodulators for non-malignant disease	
Complementary List	
<input type="checkbox"/> adalimumab* Therapeutic alternatives*: - certolizumab pegol - etanercept - golimumab - infliximab *including quality-assured biosimilars	 <i>Injection:</i> 10 mg/0.2 mL [c]; 20 mg/0.4 mL [c]; 40 mg/0.8 mL; 40 mg/0.4 mL.
azathioprine	<i>Oral liquid:</i> 10 mg/mL [c]. <i>Powder for injection:</i> 50 mg [c]; 100 mg (as sodium salt) in vial. <i>Tablet:</i> 25 mg [c]. <i>Tablet (scored):</i> 50 mg.
ciclosporin	<i>Capsule:</i> 25 mg. <i>Concentrate for injection:</i> 50 mg/mL in 1 mL ampoule. <i>Oral liquid:</i> 100 mg/mL [c].
tacrolimus	<i>Capsule (immediate-release):</i> 0.5 mg; 0.75 mg; 1 mg; 2 mg; 5 mg. <i>Granules for oral suspension:</i> 0.2 mg; 1 mg. <i>Injection:</i> 5 mg/mL in 1 mL vial.

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8.2 Antineoplastics and supportive medicines	
Medicines listed below should be used according to protocols for treatment of the diseases.	
8.2.1 Cytotoxic medicines	
Complementary List	
<i>arsenic trioxide</i>	<p>Concentrate for solution for infusion: 1 mg/mL; 2 mg/mL.</p> <ul style="list-style-type: none"> – Acute promyelocytic leukaemia
<i>asparaginase*</i> *including quality-assured biosimilars	<p>Powder for injection: 10 000 IU in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia.
<i>bendamustine</i>	<p>Injection: 45 mg/0.5 mL; 180 mg/2 mL.</p> <ul style="list-style-type: none"> – Chronic lymphocytic leukaemia – Follicular lymphoma
<i>bleomycin</i>	<p>Powder for injection: 15 000 IU (as sulfate) in vial.</p> <ul style="list-style-type: none"> – Hodgkin lymphoma – Kaposi sarcoma – Ovarian germ cell tumour – Testicular germ cell tumour
<i>calcium folinate (leucovorin calcium)</i>	<p>Injection: 3 mg/mL in 10 mL ampoule; 7.5 mg/mL in 2 mL ampoule; 10 mg/mL in 5 mL ampoule.</p> <p>Tablet: 5 mg; 15 mg; 25 mg.</p> <ul style="list-style-type: none"> – Burkitt lymphoma – Early stage colon cancer – Early stage rectal cancer – Gestational trophoblastic neoplasia – Metastatic colorectal cancer – Osteosarcoma
<i>capecitabine</i>	<p>Tablet: 150 mg; 500 mg.</p> <ul style="list-style-type: none"> – Early stage colon cancer – Early stage rectal cancer – Metastatic breast cancer – Metastatic colorectal cancer
<i>carboplatin</i>	<p>Injection: 50 mg/5 mL; 150 mg/15 mL; 450 mg/45 mL; 600 mg/60 mL.</p> <ul style="list-style-type: none"> – Cervical cancer – Early stage breast cancer – Epithelial ovarian cancer – Head and neck cancer (as a radio-sensitizer) – Low-grade glioma – Nasopharyngeal cancer – Nephroblastoma (Wilms tumour) – Non-small cell lung cancer – Osteosarcoma – Ovarian germ cell tumour – Retinoblastoma – Testicular germ cell tumour
<i>chlorambucil</i>	<p>Tablet: 2 mg.</p> <ul style="list-style-type: none"> – Chronic lymphocytic leukaemia

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<i>cisplatin</i>	<p>Injection: 10 mg/10 mL; 20 mg/20 mL; 50 mg/50 mL; 100 mg/100 mL.</p> <ul style="list-style-type: none"> – Cervical cancer – Head and neck cancer (as a radio-sensitizer) – Low-grade glioma – Nasopharyngeal cancer (as a radio-sensitizer) – Non-small cell lung cancer – Osteosarcoma – Ovarian germ cell tumour – Testicular germ cell tumour
<i>cyclophosphamide</i>	<p>Powder for injection: 500 mg; 1 g; 2 g in vial. Solid oral dosage form: 25 mg; 50 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Chronic lymphocytic leukaemia – Diffuse large B-cell lymphoma – Early stage breast cancer – Ewing sarcoma – Follicular lymphoma – Gestational trophoblastic neoplasia – Hodgkin lymphoma – Low-grade glioma – Metastatic breast cancer – Multiple myeloma – Nephroblastoma (Wilms tumour) – Rhabdomyosarcoma
<i>cytarabine</i>	<p>Injection: 100 mg/mL in vial Powder for injection: 100 mg in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute myeloid leukaemia – Acute promyelocytic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Langerhans cell histiocytosis
<i>dacarbazine</i>	<p>Powder for injection: 100 mg; 200 mg in vial.</p> <ul style="list-style-type: none"> – Hodgkin lymphoma
<i>dactinomycin</i>	<p>Powder for injection: 500 micrograms in vial.</p> <ul style="list-style-type: none"> – Ewing sarcoma – Gestational trophoblastic neoplasia – Nephroblastoma (Wilms tumour) – Rhabdomyosarcoma
<i>daunorubicin</i>	<p>Injection: 2 mg/mL; 5 mg/mL (as hydrochloride) in vial. Powder for injection: 20 mg; 50 mg (as hydrochloride) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute myeloid leukaemia – Acute promyelocytic leukaemia

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<i>docetaxel</i>	<p>Injection: 20 mg/mL; 40 mg/mL.</p> <ul style="list-style-type: none"> – Early stage breast cancer – Metastatic breast cancer – Metastatic prostate cancer
<i>doxorubicin</i>	<p>Injection: 2 mg/mL (hydrochloride) in vial.</p> <p>Powder for injection: 10 mg; 50 mg (hydrochloride) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Diffuse large B-cell lymphoma – Early stage breast cancer – Ewing sarcoma – Follicular lymphoma – Hodgkin lymphoma – Kaposi sarcoma – Metastatic breast cancer – Multiple myeloma – Nephroblastoma (<i>Wilms tumour</i>) – Osteosarcoma
<i>doxorubicin (as pegylated liposomal)</i>	<p>Injection: 2 mg/mL (hydrochloride) in 10 mL, 25 mL vial</p> <ul style="list-style-type: none"> – Kaposi sarcoma
<i>etoposide</i>	<p>Capsule: 50 mg, 100 mg.</p> <p>Injection: 20 mg/mL in 5 mL ampoule.</p> <p>Powder for injection: 100 mg (as phosphate) in vial</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute myeloid leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Ewing sarcoma – Gestational trophoblastic neoplasia – Hodgkin lymphoma – Nephroblastoma (<i>Wilms tumour</i>) – Non-small cell lung cancer – Osteosarcoma – Ovarian germ cell tumour – Retinoblastoma – Testicular germ cell tumour
<i>fludarabine</i>	<p>Powder for injection: 50 mg (phosphate) in vial.</p> <p>Tablet: 10 mg</p> <ul style="list-style-type: none"> – Chronic lymphocytic leukaemia.
<i>fluorouracil</i>	<p>Injection: 50 mg/mL in vial.</p> <ul style="list-style-type: none"> – Early stage breast cancer – Early stage colon cancer – Early stage rectal cancer – Metastatic colorectal cancer – Nasopharyngeal cancer
<i>gemcitabine</i>	<p>Powder for injection: 200 mg; 1 g in vial.</p> <ul style="list-style-type: none"> – Epithelial ovarian cancer – Non-small cell lung cancer

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<i>hydroxycarbamide (hydroxyurea)</i>	<p>Solid oral dosage form: 100 mg [c]; 200 mg; 300 mg; 400 mg; 500 mg; 1 g.</p> <ul style="list-style-type: none"> – Chronic myeloid leukaemia
<i>ifosfamide</i>	<p>Powder for injection: 500 mg; 1 g; 2 g in vial.</p> <ul style="list-style-type: none"> – Anaplastic large cell lymphoma – Burkitt lymphoma – Ewing sarcoma – Nephroblastoma (<i>Wilms tumour</i>) – Ovarian germ cell tumour – Osteosarcoma – Rhabdomyosarcoma – Testicular germ cell tumour
<i>irinotecan</i>	<p>Injection: 40 mg/2 mL in 2 mL vial; 100 mg/5 mL in 5 mL vial; 500 mg/25 mL in 25 mL vial.</p> <ul style="list-style-type: none"> – Metastatic colorectal cancer – Nephroblastoma (<i>Wilms tumour</i>) – Rhabdomyosarcoma
<i>melphalan</i>	<p>Tablet: 2 mg</p> <p>Powder for injection: 50 mg in vial</p> <ul style="list-style-type: none"> – Multiple myeloma
<i>mercaptopurine</i>	<p>Tablet: 50 mg.</p> <p>Oral liquid: 20 mg/mL [c].</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute promyelocytic leukaemia. – Langerhans cell histiocytosis
<i>methotrexate</i>	<p>Concentrated injection: 1000 mg/10 mL.</p> <p>Injection: 50mg/2 mL.</p> <p>Powder for injection: 50 mg (as sodium) in vial.</p> <p>Tablet: 2.5 mg (as sodium).</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Acute promyelocytic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Early stage breast cancer – Gestational trophoblastic neoplasia – Langerhans cell histiocytosis – Osteosarcoma
<i>oxaliplatin</i>	<p>Injection: 50 mg/10 mL in 10 mL vial; 100 mg/20 mL in 20 mL vial; 200 mg/40 mL in 40 mL vial.</p> <p>Powder for injection: 50 mg; 100 mg in vial.</p> <ul style="list-style-type: none"> – Early stage colon cancer – Metastatic colorectal cancer

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paclitaxel	<p><i>Injection:</i> 6 mg/mL in vial.</p> <ul style="list-style-type: none"> – Cervical cancer – Epithelial ovarian cancer – Early stage breast cancer – Metastatic breast cancer – Kaposi sarcoma – Nasopharyngeal cancer – Non-small cell lung cancer – Ovarian germ cell tumour
<p>pegaspargase*</p> <p>*including quality-assured biosimilars</p>	<p><i>Injection:</i> 3750 units/5 mL in vial.</p> <p><i>Powder for injection:</i> 3750 units in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia
procarbazine [c]	<p><i>Capsule:</i> 50 mg (as hydrochloride).</p> <ul style="list-style-type: none"> – Hodgkin lymphoma
realgar-Indigo naturalis formulation	<p><i>Tablet:</i> 270 mg (containing tetra-arsenic tetra-sulfide 30 mg).</p> <ul style="list-style-type: none"> – Acute promyelocytic leukaemia
tioguanine [c]	<p><i>Solid oral dosage form:</i> 40 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia
vinblastine	<p><i>Injection:</i> 10 mg/10 mL (sulfate) in vial.</p> <p><i>Powder for injection:</i> 10 mg (sulfate) in vial.</p> <ul style="list-style-type: none"> – Anaplastic large cell lymphoma – Hodgkin lymphoma – Kaposi sarcoma – Langerhans cell histiocytosis – Low-grade glioma – Ovarian germ cell tumour – Testicular germ cell tumour
vincristine	<p><i>Injection:</i> 1 mg/mL (sulfate); 2 mg/2 mL (sulfate) in vial.</p> <p><i>Powder for injection:</i> 1 mg; 5 mg (sulfate) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma – Diffuse large B-cell lymphoma – Ewing sarcoma – Follicular lymphoma – Gestational trophoblastic neoplasia – Hodgkin lymphoma – Kaposi sarcoma – Langerhans cell histiocytosis – Low-grade glioma – Nephroblastoma (Wilms tumour) – Retinoblastoma – Rhabdomyosarcoma
vinorelbine	<p><i>Capsule:</i> 20 mg; 30 mg; 80 mg.</p> <p><i>Injection:</i> 10 mg/mL in 1 mL, 5 mL vial.</p> <ul style="list-style-type: none"> – Non-small cell lung cancer – Metastatic breast cancer – Rhabdomyosarcoma

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8.2.2 Targeted therapies	
Complementary List	
<i>all-trans retinoid acid (ATRA)</i>	Capsule: 10 mg. – Acute promyelocytic leukaemia.
<i>bortezomib</i>	Powder for injection: 3.5 mg in vial. – Multiple myeloma
<i>dasatinib</i>	Tablet: 20 mg; 50 mg; 70 mg; 80 mg; 100 mg; 140 mg. – Imatinib-resistant chronic myeloid leukaemia
<input checked="" type="checkbox"/> <i>erlotinib</i> Therapeutic alternatives: - afatinib - gefitinib	Tablet: 100 mg, 150 mg. – EGFR mutation-positive advanced non-small cell lung cancer
<i>everolimus</i>	Tablet: 2.5 mg; 5 mg; 7.5 mg; 10 mg. Tablet (dispersible): 2 mg; 3 mg; 5 mg. – Subependymal giant cell astrocytoma
<i>ibrutinib</i>	Capsule: 140 mg. – Relapsed/refractory chronic lymphocytic leukaemia
<i>imatinib</i>	Solid oral dosage form: 100 mg; 400 mg. – Chronic myeloid leukaemia – Gastrointestinal stromal tumour – Philadelphia chromosome positive acute lymphoblastic leukaemia
<i>nilotinib</i>	Capsule: 150 mg; 200 mg. – Imatinib-resistant chronic myeloid leukaemia
<i>rituximab*</i> *including quality-assured biosimilars	Injection (intravenous): 100 mg/10 mL in 10 mL vial; 500 mg/50 mL in 50 mL vial. – Burkitt lymphoma – Diffuse large B-cell lymphoma – Chronic lymphocytic leukaemia – Follicular lymphoma
<i>trastuzumab*</i> *including quality-assured biosimilars	Powder for injection: 60 mg; 150 mg; 440 mg in vial. – Early stage HER2-positive breast cancer – Metastatic HER2-positive breast cancer

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8.2.3 Immunomodulators	
Complementary List	
<p><i>filgrastim*</i> *including quality-assured biosimilars</p>	<p>Injection: 120 micrograms/0.2 mL; 300 micrograms/0.5 mL; 480 micrograms/0.8 mL in pre-filled syringe.</p> <p>Injection: 300 micrograms/mL in 1 mL vial; 480 micrograms/1.6 mL in 1.6 mL vial.</p> <ul style="list-style-type: none"> – Primary prophylaxis in patients at high risk for developing febrile neutropenia associated with myelotoxic chemotherapy. – Secondary prophylaxis for patients who have experienced neutropenia following prior myelotoxic chemotherapy – To facilitate administration of dose dense chemotherapy regimens
<p><i>lenalidomide</i></p>	<p>Capsule: 25 mg.</p> <ul style="list-style-type: none"> – Multiple myeloma
<p><input type="checkbox"/> <i>nivolumab*</i> Therapeutic alternatives*: - pembrolizumab *including quality-assured biosimilars</p>	<p>Concentrate solution for infusion: 10 mg/mL.</p> <ul style="list-style-type: none"> – Metastatic melanoma
<p><i>pegfilgrastim*</i> *including quality-assured biosimilars</p>	<p>Injection: 6 mg/0.6 mL in pre-filled syringe.</p> <ul style="list-style-type: none"> – Primary prophylaxis in patients at high risk for developing febrile neutropenia associated with myelotoxic chemotherapy – Secondary prophylaxis for patients who have experienced neutropenia following prior myelotoxic chemotherapy – To facilitate administration of dose dense chemotherapy regimens
<p><i>thalidomide</i></p>	<p>Capsule: 50 mg.</p> <ul style="list-style-type: none"> – Multiple myeloma
8.2.4 Hormones and antihormones	
Complementary List	
<p><input type="checkbox"/> <i>abiraterone</i> Therapeutic alternatives: - enzalutamide</p>	<p>Tablet: 250 mg; 500 mg.</p> <ul style="list-style-type: none"> – Metastatic castration-resistant prostate cancer
<p><input type="checkbox"/> <i>anastrozole</i> Therapeutic alternatives: - 4th level ATC chemical subgroup (L02BG Aromatase inhibitors)</p>	<p>Tablet: 1 mg.</p> <ul style="list-style-type: none"> – Early stage breast cancer – Metastatic breast cancer
<p><input type="checkbox"/> <i>bicalutamide</i> Therapeutic alternatives: - flutamide - nilutamide</p>	<p>Tablet: 50 mg.</p> <ul style="list-style-type: none"> – Metastatic prostate cancer

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<i>dexamethasone</i>	<p>Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.</p> <p>Oral liquid: 2 mg/5 mL [c].</p> <p>Tablet: 2 mg [c]; 4 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Multiple myeloma
<i>hydrocortisone</i>	<p>Powder for injection: 100 mg (as sodium succinate) in vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Burkitt lymphoma
<input type="checkbox"/> <i>leuprorelin</i> <i>Therapeutic alternatives:</i> - goserelin - triptorelin	<p>Injection: 7.5 mg; 22.5 mg in pre-filled syringe.</p> <ul style="list-style-type: none"> – Early stage breast cancer – Metastatic prostate cancer.
<i>methylprednisolone [c]</i>	<p>Injection: 40 mg/mL (as sodium succinate) in 1 mL single-dose vial and 5 mL multi-dose vials; 80 mg/mL (as sodium succinate) in 1 mL single-dose vial.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukamia – Burkitt lymphoma
<input type="checkbox"/> <i>prednisolone</i> <i>Therapeutic alternatives:</i> - prednisone	<p>Oral liquid: 5 mg/mL [c].</p> <p>Tablet: 5 mg; 25 mg.</p> <ul style="list-style-type: none"> – Acute lymphoblastic leukaemia – Anaplastic large cell lymphoma – Burkitt lymphoma – Chronic lymphocytic leukaemia – Diffuse large B-cell lymphoma – Follicular lymphoma – Hodgkin lymphoma – Langerhans cell histiocytosis – Metastatic castration-resistsnt prostate cancer – Multiple myeloma
<i>tamoxifen</i>	<p>Tablet: 10 mg; 20 mg (as citrate).</p> <ul style="list-style-type: none"> – Early stage breast cancer – Metastatic breast cancer.
8.2.5 Supportive medicines	
<i>Complementary List</i>	
<i>allopurinol [c]</i>	<p>Tablet: 100 mg; 300 mg.</p> <ul style="list-style-type: none"> – Tumour lysis syndrome
<i>mesna</i>	<p>Injection: 100 mg/mL in 4 mL and 10 mL ampoules.</p> <p>Tablet: 400 mg; 600 mg.</p> <ul style="list-style-type: none"> – Burkitt lymphoma – Ewing sarcoma – Nephroblastoma (Wilms tumour) – Ovarian germ cell tumour – Osteosarcoma – Rhabdomyosarcoma – Testicular germ cell tumour

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<i>rasburicase</i>	<i>Powder and solvent for solution for infusion:</i> 1.5 mg; 7.5 mg in vial. – Tumour lysis syndrome
<i>zoledronic acid</i>	<i>Concentrate solution for infusion:</i> 4 mg/5 mL in 5 mL vial. <i>Solution for infusion:</i> 4 mg/100 mL in 100 mL bottle. – Malignancy-related bone disease

9. THERAPEUTIC FOODS

ready-to-use therapeutic food [c]	Biscuit or paste*. *of nutritional composition as determined by the UN joint statement on the community-based management of severe acute malnutrition and Codex alimentarius guidelines.
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10. MEDICINES AFFECTING THE BLOOD

10.1 Antianaemia medicines

ferrous salt	Oral liquid: equivalent to 25 mg iron (as sulfate)/mL. Tablet: equivalent to 60 mg iron.
ferrous salt + folic acid	Tablet: equivalent to 60 mg elemental iron + 400 micrograms folic acid.* *nutritional supplement for use during pregnancy Tablet: equivalent to 60 mg elemental iron + 2.8 mg folic acid.** **for weekly iron and folic acid supplementation
folic acid	Tablet: 400 micrograms*; 1 mg; 5 mg. *periconceptual use for prevention of first occurrence of neural tube defects
hydroxocobalamin	Injection: 1 mg/mL (as acetate, as hydrochloride or as sulfate) in 1 mL ampoule.

Complementary List

<input type="checkbox"/> erythropoiesis-stimulating agents*	Injection: pre-filled syringe 1000 IU/0.5 mL; 2000 IU/0.5 mL; 3000 IU/0.3 mL; 4000 IU/0.4 mL; 5000 IU/0.5 mL; 6000 IU/0.6 mL; 8000 IU/0.8mL; 10 000 IU/1 mL; 20 000 IU/0.5 mL; 40 000 IU/1 mL.
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10.2 Medicines affecting coagulation

<input type="checkbox"/> dabigatran	
Therapeutic alternatives: - apixaban - edoxaban - rivaroxaban	Capsule: 110 mg; 150 mg.

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<p>o enoxaparin*</p> <p>Therapeutic alternatives*:</p> <ul style="list-style-type: none"> - dalteparin - nadroparin <p>*including quality-assured biosimilars</p>	<p>Injection: ampoule or pre-filled syringe</p> <p>20 mg/0.2 mL; 40 mg/0.4 mL; 60 mg/0.6 mL; 80 mg/0.8 mL; 100 mg/1 mL; 120 mg/0.8 mL; 150 mg/1 mL.</p>
heparin sodium	<p>Injection: 1000 IU/mL; 5000 IU/mL; 20 000 IU/mL in 1 mL ampoule.</p>
phytomenadione	<p>Injection: 1 mg/mL [c]; 10 mg/mL in ampoule.</p> <p>Tablet: 10 mg.</p>
protamine sulfate	<p>Injection: 10 mg/mL in 5 mL ampoule.</p>
tranexamic acid	<p>Injection: 100 mg/mL in 10 mL ampoule.</p>
<input type="checkbox"/> warfarin Therapeutic alternatives to be reviewed	<p>Tablet: 1 mg; 2 mg; 5 mg (sodium).</p>

Complementary List

<p>desmopressin [c]</p>	<p>Injection: 4 micrograms/mL (as acetate) in 1 mL ampoule.</p> <p>Nasal spray: 10 micrograms (as acetate) per dose.</p>
<p>heparin sodium [c]</p>	<p>Injection: 1000 IU/mL; 5000 IU/mL in 1 mL ampoule.</p>
<p>protamine sulfate [c]</p>	<p>Injection: 10 mg/mL in 5 mL ampoule.</p>
<input type="checkbox"/> warfarin [c] Therapeutic alternatives to be reviewed	<p>Tablet: 0.5 mg; 1 mg; 2 mg; 5 mg (sodium).</p>

10.3 Other medicines for haemoglobinopathies

<input type="checkbox"/> deferasirox Therapeutic alternatives: <ul style="list-style-type: none"> - deferiprone 	<p>Tablet (dispersible): 100 mg; 125 mg; 250 mg; 400 mg; 500 mg.</p> <p>Tablet (film-coated): 90 mg; 180 mg; 360 mg.</p>
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Complementary List

deferoxamine	<p>Powder for injection: 500 mg (mesilate) in vial.</p>
hydroxycarbamide (hydroxyurea)	<p>Solid oral dosage form: 100 mg [c]; 200 mg; 500 mg; 1 g.</p>

11. BLOOD PRODUCTS OF HUMAN ORIGIN AND PLASMA SUBSTITUTES

11.1 Blood and blood components

In accordance with the World Health Assembly resolution WHA63.12, WHO recognizes that achieving self-sufficiency, unless special circumstances preclude it, in the supply of safe blood components based on voluntary, non-remunerated blood donation, and the security of that supply are important national goals to prevent blood shortages and meet the transfusion requirements of the patient population. All preparations should comply with the WHO requirements.	
<input type="checkbox"/> cryoprecipitate, pathogen-reduced Therapeutic alternatives: <ul style="list-style-type: none"> - cryoprecipitate (not pathogen-reduced) 	<p>Injection: frozen liquid in bag or lyophilized powder in vial containing:</p> <ul style="list-style-type: none"> - > 50 IU Factor VIII - > 100 IU vWF - > 140 mg clottable fibrinogen per unit

fresh-frozen plasma	
platelets	
red blood cells	

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whole blood	
11.2 Plasma-derived medicines	
All human plasma-derived medicines should comply with the WHO requirements.	
11.2.1 Human immunoglobulins	
anti-D immunoglobulin	Injection: 250 micrograms in single-dose vial.
anti-rabies immunoglobulin	Injection: 150 IU/mL in vial.
anti-tetanus immunoglobulin	Injection: 500 IU in vial.
<i>Complementary List</i>	
<i>normal immunoglobulin</i>	<p>Intramuscular administration: 16% protein solution.</p> <p>Subcutaneous administration: 15%; 16% protein solution.</p> <ul style="list-style-type: none"> – Primary immune deficiency. <p>Intravenous administration: 5%; 10% protein solution.</p> <ul style="list-style-type: none"> – Primary immune deficiency – Kawasaki disease – Langerhans cell histiocytosis
11.2.2 Blood coagulation factors	
<i>Complementary List</i>	
coagulation factor VIII	Powder for injection: 250 IU; 500 IU; 1000 IU in vial.
<input type="checkbox"/> coagulation factor IX Therapeutic alternatives: - coagulation factor IX complex	Powder for injection: 500 IU; 1000 IU in vial.
11.3 Plasma substitutes	
<input type="checkbox"/> dextran 70 Therapeutic alternatives: - polygeline injectable solution 3.5%	Injectable solution: 6%.
12. CARDIOVASCULAR MEDICINES	
12.1 Antianginal medicines	
<input type="checkbox"/> bisoprolol Therapeutic alternatives: - carvedilol - metoprolol	Tablet: 1.25 mg; 5 mg.
glyceryl trinitrate	Tablet (sublingual): 500 micrograms.
isosorbide dinitrate	Tablet (sublingual): 5 mg.
verapamil	Tablet: 40 mg; 80 mg (hydrochloride).

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12.2 Antiarrhythmic medicines	
<input type="checkbox"/> bisoprolol Therapeutic alternatives: - carvedilol - metoprolol	Tablet: 1.25 mg; 5 mg.
digoxin	Injection: 250 micrograms/mL in 2 mL ampoule. Oral liquid: 50 micrograms/mL. Tablet: 62.5 micrograms; 250 micrograms.
epinephrine (adrenaline)	Injection: 100 micrograms/mL (as acid tartrate or hydrochloride) in 10 mL ampoule.
lidocaine	Injection: 20 mg/mL (hydrochloride) in 5 mL ampoule.
verapamil	Injection: 2.5 mg/mL (hydrochloride) in 2 mL ampoule. Tablet: 40 mg; 80 mg (hydrochloride).
Complementary List	
amiodarone	Injection: 50 mg/mL (hydrochloride) in 3 mL ampoule. Tablet: 100 mg; 200 mg; 400 mg (hydrochloride).
12.3 Antihypertensive medicines	
<input type="checkbox"/> amlodipine Therapeutic alternatives: - 4 th level ATC chemical subgroup (C08CA Dihydropyridine derivatives)	Tablet: 5 mg (as maleate, mesylate or besylate).
<input type="checkbox"/> bisoprolol Therapeutic alternatives: - atenolol* - carvedilol - metoprolol	Tablet: 1.25 mg; 5 mg. <small>*atenolol should not be used as a first-line agent in uncomplicated hypertension in patients > 60 years</small>
<input type="checkbox"/> enalapril Therapeutic alternatives: - 4 th level ATC chemical subgroup (C09AA ACE inhibitors, plain)	Oral liquid: 1 mg/mL (as hydrogen maleate) [c]. Tablet: 2.5 mg; 5 mg; 10 mg (as hydrogen maleate).
hydralazine*	Powder for injection: 20 mg (hydrochloride) in ampoule. Tablet: 25 mg; 50 mg (hydrochloride). <small>*Hydralazine is listed for use only in the acute management of severe pregnancy-induced hypertension. Its use in the treatment of essential hypertension is not recommended in view of the evidence of greater efficacy and safety of other medicines.</small>
<input type="checkbox"/> hydrochlorothiazide Therapeutic alternatives: - chlorothiazide - chlorthalidone - indapamide	Oral liquid: 50 mg/5 mL. Solid oral dosage form: 12.5 mg; 25 mg.

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<p><input type="checkbox"/> lisinopril + <input type="checkbox"/> amlodipine</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for lisinopril) - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives) (for amlodipine) 	<p>Tablet: 10 mg + 5 mg; 20 mg + 5 mg; 20 mg + 10 mg.</p>
<p><input type="checkbox"/> lisinopril + <input type="checkbox"/> hydrochlorothiazide</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for lisinopril) - chlorthalidone, chlorothiazide, indapamide (for hydrochlorothiazide) 	<p>Tablet: 10 mg + 12.5 mg; 20 mg + 12.5 mg; 20 mg + 25 mg.</p>
<p><input type="checkbox"/> losartan</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain) 	<p>Tablet: 25 mg; 50 mg; 100 mg.</p>
<p><input type="checkbox"/> methyldopa*</p>	<p>Tablet: 250 mg.</p> <p>*Methyldopa is listed for use only in the management of pregnancy-induced hypertension. Its use in the treatment of essential hypertension is not recommended in view of the evidence of greater efficacy and safety of other medicines.</p>
<p><input type="checkbox"/> telmisartan + <input type="checkbox"/> amlodipine</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain) (for telmisartan) - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives) (for amlodipine) 	<p>Tablet: 40 mg + 5 mg; 80 mg + 5 mg; 80 mg + 10 mg.</p>
<p><input type="checkbox"/> telmisartan + <input type="checkbox"/> hydrochlorothiazide</p> <p>Therapeutic alternatives:</p> <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain) (for telmisartan) - chlorthalidone, chlorothiazide, indapamide (for hydrochlorothiazide) 	<p>Tablet: 40 mg + 12.5 mg; 80 mg + 12.5 mg; 80 mg + 25 mg.</p>
<p>Complementary List</p>	
<p><i>sodium nitroprusside</i></p>	<p>Powder for infusion: 50 mg in ampoule.</p>

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12.4 Medicines used in heart failure	
<input type="checkbox"/> bisoprolol Therapeutic alternatives: - carvedilol - metoprolol	Tablet: 1.25 mg; 5 mg.
<input type="checkbox"/> digoxin	Injection: 250 micrograms/mL in 2 mL ampoule. Oral liquid: 50 micrograms/mL. Tablet: 62.5 micrograms; 250 micrograms.
<input type="checkbox"/> enalapril Therapeutic alternatives: - 4 th level ATC chemical subgroup (C09AA ACE inhibitors, plain)	Tablet: 2.5 mg; 5 mg; 10 mg (as hydrogen maleate).
<input type="checkbox"/> furosemide Therapeutic alternatives: - bumetanide - torasemide	Injection: 10 mg/mL in 2 mL, 5 mL ampoule. Oral liquid: 20 mg/5 mL; 50 mg/5 mL [c]. Tablet: 20 mg; 40 mg.
<input type="checkbox"/> hydrochlorothiazide Therapeutic alternatives: - chlorothiazide - chlorthalidone - indapamide	Oral liquid: 50 mg/5 mL. Solid oral dosage form: 25 mg.
<input type="checkbox"/> losartan Therapeutic alternatives: - 4 th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain)	Tablet: 25 mg; 50 mg; 100 mg.
spironolactone	Tablet: 25 mg.
<i>Complementary List</i>	
<input type="checkbox"/> digoxin [c]	Injection: 100 micrograms/mL in 1 mL ampoule; 250 micrograms/mL in 2 mL ampoule. Oral liquid: 50 micrograms/mL. Tablet: 62.5 micrograms; 125 micrograms; 250 mg micrograms.
<input type="checkbox"/> dopamine	Injection: 40 mg/mL (hydrochloride) in 5 mL vial.
12.5 Antithrombotic medicines	
12.5.1 Anti-platelet medicines	
acetylsalicylic acid	Tablet: 100 mg.
clopidogrel	Tablet: 75 mg; 300 mg
12.5.2 Thrombolytic medicines	
<i>Complementary List</i>	
<input type="checkbox"/> alteplase	Powder for injection: 10 mg; 20 mg; 50 mg in vial
<input type="checkbox"/> streptokinase	Powder for injection: 1.5 million IU in vial.

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12.6 Lipid-lowering agents	
<input type="checkbox"/> simvastatin* Therapeutic alternatives: <ul style="list-style-type: none"> - atorvastatin - fluvastatin - lovastatin - pravastatin 	Tablet: 5 mg; 10 mg; 20 mg; 40 mg. *For use in high-risk patients.
12.7 Fixed-dose combinations for prevention of atherosclerotic cardiovascular disease	
acetylsalicylic acid + <input type="checkbox"/> atorvastatin + <input type="checkbox"/> ramipril Therapeutic alternatives: <ul style="list-style-type: none"> - fluvastatin, lovastatin, pravastatin, simvastatin (for atorvastatin) - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for ramipril) 	Tablet: 100 mg + 20 mg + 2.5 mg; 100 mg + 20 mg + 5 mg; 100 mg + 20 mg + 10 mg; 100 mg + 40 mg + 2.5 mg; 100 mg + 40 mg + 5 mg; 100 mg + 40 mg + 10 mg.
acetylsalicylic acid + <input type="checkbox"/> simvastatin + <input type="checkbox"/> ramipril + <input type="checkbox"/> atenolol + <input type="checkbox"/> hydrochlorothiazide Therapeutic alternatives: <ul style="list-style-type: none"> - atorvastatin, fluvastatin, lovastatin, pravastatin (for simvastatin) - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for ramipril) - bisoprolol, carvedilol, metoprolol (for atenolol) - chlorthalidone, chlorothiazide, indapamide (for hydrochlorothiazide) 	Tablet: 100 mg + 20 mg + 5 mg + 50 mg + 12.5 mg.
<input type="checkbox"/> atorvastatin + <input type="checkbox"/> perindopril + <input type="checkbox"/> amlodipine Therapeutic alternatives: <ul style="list-style-type: none"> - fluvastatin, lovastatin, pravastatin, simvastatin (for atorvastatin) - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for perindopril) - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives) (for amlodipine) 	Tablet: 20 mg + 5 mg + 5 mg; 20 mg + 10 mg + 10 mg; 40 mg + 5 mg + 5 mg; 40 mg + 10 mg + 10 mg.
13. DERMATOLOGICAL MEDICINES	
13.1 Antifungal medicines	
<input type="checkbox"/> miconazole Therapeutic alternatives: <ul style="list-style-type: none"> - 4th level ATC chemical subgroup (D01AC Imidazole and triazole derivatives) excluding combinations 	Cream or ointment: 2% (nitrate).
selenium sulfide	Detergent-based suspension: 2%.
sodium thiosulfate	Solution: 15%.
terbinafine	Cream or ointment: 1% (hydrochloride).

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13.2 Anti-infective medicines	
mupirocin	Cream: 2% (as calcium). Ointment: 2%.
potassium permanganate	Aqueous solution: 1:10 000.
silver sulfadiazine <small>a</small>	Cream: 1%. <small>a</small> > 2 months.
13.3 Anti-inflammatory and antipruritic medicines	
<input type="checkbox"/> betamethasone <small>a</small> Therapeutic alternatives: - 4 th level ATC chemical subgroup (D07AC Corticosteroids, potent (group III))	Cream or ointment: 0.1% (as valerate). <small>a</small> Hydrocortisone preferred in neonates.
calamine	Lotion.
<input type="checkbox"/> hydrocortisone Therapeutic alternatives: - 4 th level ATC chemical subgroup (D07AA Corticosteroids, weak (group I))	Cream or ointment: 1% (acetate).
13.4 Medicines affecting skin differentiation and proliferation	
benzoyl peroxide	Cream or lotion: 5%.
<input type="checkbox"/> calcipotriol Therapeutic alternatives: - calcitriol - tacalcitol	Cream or ointment: 50 micrograms/mL (0.005%). Lotion: 50 micrograms/mL (0.005%).
coal tar	Solution: 5%.
fluorouracil	Ointment: 5%.
<input type="checkbox"/> podophyllum resin Therapeutic alternatives: - podophyllotoxin	Solution: 10% to 25%.
salicylic acid	Solution: 5%.
urea	Cream or ointment: 5%; 10%.
<i>Complementary List</i>	
<i>methotrexate</i>	Tablet: 2.5 mg; 10 mg (as sodium).
13.5 Scabicides and pediculicides	
<input type="checkbox"/> benzyl benzoate <small>a</small> Therapeutic alternatives: - precipitated sulfur topical ointment	Lotion: 25%. <small>a</small> > 2 years.
permethrin	Cream: 5%. Lotion: 1%.

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14. DIAGNOSTIC AGENTS	
14.1 Ophthalmic medicines	
fluorescein	Eye drops: 1% (sodium salt).
<input type="checkbox"/> tropicamide Therapeutic alternatives: - atropine - cyclopentolate	Eye drops: 0.5%.
14.2 Radiocontrast media	
<input type="checkbox"/> amidotrizoate Therapeutic alternatives to be reviewed	Injection: 140 mg to 420 mg iodine/mL (as sodium or meglumine salt) in 20 mL ampoule.
barium sulfate	Aqueous suspension.
<input type="checkbox"/> iohexol Therapeutic alternatives to be reviewed	Injection: 140 mg to 350 mg iodine/mL in 5 mL, 10 mL, 20 mL ampoules.
<i>Complementary List</i>	
barium sulfate [c]	Aqueous suspension.
<input type="checkbox"/> meglumine iotroxate Therapeutic alternatives to be reviewed	Solution: 5 g to 8 g iodine in 100 mL to 250 mL.
15. ANTISEPTICS AND DISINFECTANTS	
15.1 Antiseptics	
<input type="checkbox"/> chlorhexidine Therapeutic alternatives to be reviewed	Solution: 5% (digluconate).
<input type="checkbox"/> ethanol Therapeutic alternatives: - propanol	Solution: 70% (denatured).
<input type="checkbox"/> povidone iodine Therapeutic alternatives: - iodine	Solution: 10% (equivalent to 1% available iodine).
15.2 Disinfectants	
alcohol based hand rub	Solution: containing ethanol 80% volume/volume. Solution: containing isopropyl alcohol 75% volume/volume.
chlorine base compound	Liquid: (0.1% available chlorine) for solution. Powder: (0.1% available chlorine) for solution. Solid: (0.1% available chlorine) for solution.

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o chloroxylenol Therapeutic alternatives: - 4 th level ATC chemical subgroup (D08AE Phenol and derivatives)	Solution: 4.8%.
glutaral	Solution: 2%.
16. DIURETICS	
amiloride	Tablet: 5 mg (hydrochloride).
<input type="checkbox"/> furosemide Therapeutic alternatives: - bumetanide - torasemide	Injection: 10 mg/mL in 2 mL, 5 mL ampoule. Oral liquid: 20 mg/5 mL; 50 mg/5 mL [c]. Tablet: 20 mg; 40 mg.
<input type="checkbox"/> hydrochlorothiazide Therapeutic alternatives: - chlorothiazide - chlortalidone - indapamide	Solid oral dosage form: 25 mg.
mannitol	Injectable solution: 10%; 20%.
spironolactone	Tablet: 25 mg.
<i>Complementary List</i>	
<input type="checkbox"/> hydrochlorothiazide[c] Therapeutic alternatives: - chlorothiazide - chlortalidone	Tablet (scored): 25 mg.
mannitol [c]	Injectable solution: 10%; 20%.
spironolactone[c]	Oral liquid: 5 mg/5 mL; 10 mg/5 mL; 25 mg/5 mL. Tablet: 25 mg.
17. GASTROINTESTINAL MEDICINES	
<i>Complementary List</i>	
pancreatic enzymes[c]	Age-appropriate formulations and doses including lipase, protease and amylase.
17.1 Antiulcer medicines	
<input type="checkbox"/> omeprazole Therapeutic alternatives: - 4 th level ATC chemical subgroup (A02BC Proton pump inhibitors) excluding combinations	Powder for injection: 40 mg in vial Powder for oral liquid: 20 mg; 40 mg sachets. Solid oral dosage form: 10 mg; 20 mg; 40 mg.
<input type="checkbox"/> ranitidine Therapeutic alternatives: - 4 th level ATC chemical subgroup (A02BA H ₂ -receptor antagonists) excluding combinations	Injection: 25 mg/mL (as hydrochloride) in 2 mL ampoule. Oral liquid: 75 mg/5 mL (as hydrochloride). Tablet: 150 mg (as hydrochloride).

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17.2 Antiemetic medicines	
dexamethasone	<p>Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.</p> <p>Oral liquid: 0.5 mg/5 mL; 2 mg/5 mL.</p> <p>Solid oral dosage form: 0.5 mg; 0.75 mg; 1.5 mg; 4 mg.</p>
metoclopramide a	<p>Injection: 5 mg/mL (hydrochloride) in 2 mL ampoule.</p> <p>Oral liquid: 5 mg/5 mL c.</p> <p>Tablet: 10 mg (hydrochloride).</p> <p>a Not in neonates.</p>
<input type="checkbox"/> ondansetron a Therapeutic alternatives: - dolasetron - granisetron - palonosetron - tropisetron	<p>Injection: 2 mg base/mL in 2 mL ampoule (as hydrochloride).</p> <p>Oral liquid: 4 mg base/5 mL.</p> <p>Solid oral dosage form: Eq 4 mg base; Eq 8 mg base; Eq 24 mg base.</p> <p>a > 1 month.</p>
<i>Complementary list</i>	
aprepitant	<p>Capsule: 80 mg; 125 mg; 165 mg</p> <p>Powder for oral suspension: 125 mg in sachet</p>
17.3 Anti-inflammatory medicines	
<input type="checkbox"/> sulfasalazine Therapeutic alternatives: - mesalazine	<p>Retention enema.</p> <p>Suppository: 500 mg.</p> <p>Tablet: 500 mg.</p>
<i>Complementary List</i>	
hydrocortisone	<p>Retention enema: 100 mg/60 mL.</p> <p>Suppository: 25 mg (acetate).</p>
prednisolone	Retention enema: 20 mg/100 mL (as sodium phosphate).
17.4 Laxatives	
<input type="checkbox"/> senna Therapeutic alternatives: - bisacodyl	Tablet: 7.5 mg (sennosides) (or traditional dosage forms).
17.5 Medicines used in diarrhoea	
oral rehydration salts – zinc sulfate c	<p>Co-package containing:</p> <p>ORS powder for dilution (see Section 17.5.1) – zinc sulfate solid oral dosage form 20 mg (see Section 17.5.2)</p>

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17.5.1 Oral rehydration

	Powder for dilution in 200 mL; 500 mL; 1 L.
oral rehydration salts	glucose: 75 mEq sodium: 75 mEq or mmol/L chloride: 65 mEq or mmol/L potassium: 20 mEq or mmol/L citrate: 10 mmol/L osmolarity: 245 mOsm/L glucose: 13.5 g/L sodium chloride: 2.6 g/L potassium chloride: 1.5 g/L trisodium citrate dihydrate*: 2.9 g/L
	*trisodium citrate dihydrate may be replaced by sodium hydrogen carbonate (sodium bicarbonate) 2.5 g/L. However, as the stability of this latter formulation is very poor under tropical conditions, it is recommended only when manufactured for immediate use.

17.5.2 Medicines for diarrhoea

zinc sulfate*	Solid oral dosage form: 20 mg. *In acute diarrhoea zinc sulfate should be used as an adjunct to oral rehydration salts.
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18. MEDICINES FOR ENDOCRINE DISORDERS

18.1 Adrenal hormones and synthetic substitutes

fludrocortisone	Tablet: 100 micrograms (acetate).
hydrocortisone	Tablet: 5 mg; 10 mg; 20 mg.

18.2 Androgens

Complementary List

testosterone	Injection: 200 mg (enanthate) in 1 mL ampoule.
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18.3 Estrogens

18.4 Progestogens

<input type="checkbox"/> medroxyprogesterone acetate Therapeutic alternatives: - norethisterone	Tablet: 5 mg.
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18.5 Medicines for diabetes	
18.5.1 Insulins	
insulin injection (soluble)* <i>*including quality-assured biosimilars</i>	Injection: 40 IU/mL in 10 mL vial; 100 IU/mL in 10 mL vial; 100 IU/mL in 3 mL cartridge or pre-filled pen.
intermediate-acting insulin* <i>*including quality-assured biosimilars</i>	Injection: 40 IU/mL in 10 mL vial; 100 IU/mL in 10 mL vial; 100 IU/mL in 3 mL cartridge or pre-filled pen (as compound insulin zinc suspension or isophane insulin).
<input type="checkbox"/> long-acting insulin analogues* Therapeutic alternatives: - insulin degludec - insulin detemir - insulin glargine <i>*including quality-assured biosimilars</i>	Injection: 100 IU/mL in 3 mL cartridge or pre-filled pen.
18.5.2 Oral hypoglycaemic agents	
<input type="checkbox"/> empagliflozin Therapeutic alternatives: - canagliflozin - dapagliflozin	Tablet: 10 mg; 25 mg.
<input type="checkbox"/> gliclazide* Therapeutic alternatives: - 4 th level ATC chemical subgroup (A10BB Sulfonylureas)	Solid oral dosage form: (controlled-release tablets) 30 mg; 60 mg; 80 mg. <i>*glibenclamide not suitable above 60 years.</i>
metformin	Tablet: 500 mg (hydrochloride).
<i>Complementary List</i>	
metformin [c]	Tablet: 500 mg (hydrochloride).
18.6 Medicines for hypoglycaemia	
glucagon	Injection: 1 mg/mL.
<i>Complementary List</i>	
diazoxide [c]	Oral liquid: 50 mg/mL. Tablet: 50 mg.
18.7 Thyroid hormones and antithyroid medicines	
levothyroxine	Tablet: 25 micrograms [c]; 50 micrograms; 100 micrograms (sodium salt).
potassium iodide	Tablet: 60 mg.
<input type="checkbox"/> methimazole Therapeutic alternatives: - carbimazole (depending on local availability)	Tablet: 5mg, 10mg, 20mg.
propylthiouracil*	Tablet: 50 mg. <i>*For use when alternative first-line treatment is not appropriate or available; and in patients during the first trimester of pregnancy.</i>

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Complementary List	
Lugol's solution [c]	<i>Oral liquid:</i> about 130 mg total iodine/mL.
<input type="checkbox"/> methimazole [c] Therapeutic alternatives: - carbimazole (depending on local availability)	Tablet: 5mg, 10mg, 20mg.
potassium iodide [c]	Tablet: 60 mg.
propylthiouracil* [c]	Tablet: 50 mg. <i>*For use when alternative first-line treatment is not appropriate or available</i>
18.8 Medicines for disorders of the pituitary hormone system	
<input type="checkbox"/> cabergoline Therapeutic alternatives: - bromocriptine	Tablet: 0.5 mg; 1 mg.
Complementary List	
octreotide	<i>Injection (immediate-release):</i> 0.05 mg/mL; 0.1 mg/mL; 0.5 mg/mL (as acetate) in 1 mL vial. <i>Injection (modified-release):</i> 20 mg (as acetate) in vial plus diluent.
19. IMMUNOLOGICALS	
19.1 Diagnostic agents	
All tuberculins should comply with the WHO requirements for tuberculins.	
tuberculin, purified protein derivative (PPD)	Injection.
19.2 Sera, immunoglobulins and monoclonal antibodies	
All plasma fractions should comply with the WHO requirements.	
anti-rabies virus monoclonal antibodies* <i>*including quality-assured biosimilars</i>	Injection: 40 IU/mL in 1.25 mL, 2.5 mL vial; 100 IU/mL in 2.5 mL vial (human). Injection: 300 IU/mL in 10 mL vial; 600 IU/mL in 1 mL, 2.5 mL and 5 mL vial (murine).
antivenom immunoglobulin*	Injection. <i>*Exact type to be defined locally.</i>
diphtheria antitoxin	Injection: 10 000 IU; 20 000 IU in vial.
equine rabies immunoglobulin	Injection: 150 IU/mL; 200 IU/mL; 300 IU/mL; 400 IU/mL in vial.

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19.3 Vaccines

WHO immunization policy recommendations are published in vaccine position papers based on recommendations made by the Strategic Advisory Group of Experts on Immunization (SAGE).

WHO vaccine position papers are updated three to four times per year. The list below details the vaccines for which there is a recommendation from SAGE and a corresponding WHO position paper as at March 2023. The most recent versions of the WHO position papers, reflecting the current evidence related to a specific vaccine and the related recommendations, can be accessed at any time on the WHO website at:

<https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/position-papers>

Vaccine recommendations may be universal or conditional (e.g., in certain regions, in some high-risk populations or as part of immunization programmes with certain characteristics). Details are available in the relevant position papers, and in the Summary Tables of WHO Routine Immunization Recommendations available on the WHO website at:

<https://www.who.int/teams/immunization-vaccines-and-biologicals/policies/who-recommendations-for-routine-immunization---summary-tables>

Selection of vaccines from the Model List will need to be determined by each country after consideration of international recommendations, epidemiology and national priorities.

All vaccines should comply with the WHO requirements for biological substances.

WHO noted the need for vaccines used in children to be polyvalent.

<i>Recommendations for all</i>	
BCG vaccine	
diphtheria vaccine	
Haemophilus influenzae type b vaccine	
hepatitis B vaccine	
human papilloma virus (HPV) vaccine	
measles vaccine	
pertussis vaccine	
pneumococcal vaccine	
poliomyelitis vaccine	
rotavirus vaccine	
rubella vaccine	
tetanus vaccine	
<i>Recommendations for certain regions</i>	
Japanese encephalitis vaccine	
tick-borne encephalitis vaccine	
yellow fever vaccine	
<i>Recommendations for some high-risk populations</i>	
cholera vaccine	
dengue vaccine	
hepatitis A vaccine	
meningococcal meningitis vaccine	

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rabies vaccine	
typhoid vaccine	
Recommendations for immunization programmes with certain characteristics	
influenza vaccine (seasonal)	
mumps vaccine	
varicella vaccine	
20. MUSCLE RELAXANTS (PERIPHERALLY-ACTING) AND CHOLINESTERASE INHIBITORS	
<input type="checkbox"/> atracurium Therapeutic alternatives to be reviewed	Injection: 10 mg/mL (besylate).
neostigmine	Injection: 500 micrograms/mL (methylsulfate) in 1 mL ampoule; 2.5 mg/mL (methylsulfate) in 1 mL ampoule. Tablet: 15 mg (bromide).
suxamethonium	Injection: 50 mg/mL (chloride) in 2 mL ampoule. Powder for injection: (chloride), in vial.
<input type="checkbox"/> vecuronium [c] Therapeutic alternatives: -atracurium	Powder for injection: 10 mg (bromide) in vial.
Complementary List	
pyridostigmine	Injection: 1 mg in 1 mL ampoule. Tablet: 60 mg (bromide).
<input type="checkbox"/> vecuronium Therapeutic alternatives to be reviewed	Powder for injection: 10 mg (bromide) in vial.
21. OPHTHALMOLOGICAL PREPARATIONS	
21.1 Anti-infective agents	
aciclovir	Ointment: 3% w/w.
azithromycin	Solution (eye drops): 1.5%. – <i>Trachoma</i>
erythromycin	Ointment: 0.5% [c] – <i>Infections due to Chlamydia trachomatis or Neisseria gonorrhoea.</i>
<input type="checkbox"/> gentamicin Therapeutic alternatives: - amikacin - kanamycin - netilmicin - tobramycin	Solution (eye drops): 0.3% (sulfate). – <i>Bacterial blepharitis</i> – <i>Bacterial conjunctivitis</i>
natamycin	Suspension (eye drops): 5% – <i>Fungal keratitis</i>

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<input type="checkbox"/> ofloxacin Therapeutic alternatives: - 4 th level ATC chemical subgroup (S01AE Fluoroquinolones)	Solution (eye drops): 0.3%. – <i>Bacterial conjunctivitis</i> – <i>Bacterial keratitis</i>
<input type="checkbox"/> tetracycline Therapeutic alternatives: - chlortetracycline - oxytetracycline	Eye ointment: 1% (hydrochloride). – <i>Bacterial blepharitis</i> – <i>Bacterial conjunctivitis</i> – <i>Bacterial keratitis</i> – <i>Trachoma</i>
21.2 Anti-inflammatory agents	
<input type="checkbox"/> prednisolone Therapeutic alternatives to be reviewed	Solution (eye drops): 0.5% (sodium phosphate).
21.3 Local anaesthetics	
<input type="checkbox"/> tetracaine <small>a</small> Therapeutic alternatives: - 4 th level ATC chemical subgroup (S01HA Local anaesthetics) excluding cocaine and combinations	Solution (eye drops): 0.5% (hydrochloride). <small>a</small> Not in preterm neonates.
21.4 Miotics and antiglaucoma medicines	
acetazolamide	Tablet: 250 mg.
latanoprost	Solution (eye drops): 50 micrograms/mL.
<input type="checkbox"/> pilocarpine Therapeutic alternatives: - carbachol	Solution (eye drops): 2%; 4% (hydrochloride or nitrate).
<input type="checkbox"/> timolol Therapeutic alternatives: - 4 th level ATC chemical subgroup (S01ED Beta blocking agents) excluding combinations	Solution (eye drops): 0.25%; 0.5% (as hydrogen maleate).
21.5 Mydriatics	
<input type="checkbox"/> atropine <small>a</small> Therapeutic alternatives*: - cyclopentolate hydrochloride - homatropine hydrobromide <small>*EMLc only</small>	Solution (eye drops): 0.1%; 0.5%; 1% (sulfate). <small>a</small> > 3 months.
<i>Complementary List</i>	
epinephrine (adrenaline)	Solution (eye drops): 2% (as hydrochloride).
21.6 Anti-vascular endothelial growth factor (VEGF) preparations	
<i>Complementary List</i>	
bevacizumab* <small>*including quality-assured biosimilars</small>	Injection: 25 mg/mL.

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22. MEDICINES FOR REPRODUCTIVE HEALTH AND PERINATAL CARE	
22.1 Contraceptives	
22.1.1 Oral hormonal contraceptives	
☐ ethinylestradiol + ☐ levonorgestrel Therapeutic alternatives to be reviewed	Tablet: 30 micrograms + 150 micrograms.
☐ ethinylestradiol + ☐ norethisterone Therapeutic alternatives to be reviewed	Tablet: 35 micrograms + 1 mg.
levonorgestrel	Tablet: 30 micrograms; 750 micrograms (pack of two); 1.5 mg.
ulipristal	Tablet: 30 mg (as acetate).
22.1.2 Injectable hormonal contraceptives	
estradiol cypionate + medroxyprogesterone acetate	Injection: 5 mg + 25 mg.
medroxyprogesterone acetate	Injection (intramuscular): 150 mg/mL in 1 mL vial. Injection (subcutaneous): 104 mg/0.65 mL in pre-filled syringe or single-dose injection delivery system.
norethisterone enantate	Oily solution: 200 mg/mL in 1 mL ampoule.
22.1.3 Intrauterine devices	
copper-containing device	
levonorgestrel-releasing intrauterine system	Intrauterine system: with reservoir containing 52 mg of levonorgestrel
22.1.4 Barrier methods	
condoms	
diaphragms	
22.1.5 Implantable contraceptives	
etonogestrel-releasing implant	Single-rod etonogestrel-releasing implant: containing 68 mg of etonogestrel.
levonorgestrel-releasing implant	Two-rod levonorgestrel-releasing implant: each rod containing 75 mg of levonorgestrel (150 mg total).
22.1.6 Intravaginal contraceptives	
ethinylestradiol + etonogestrel	Vaginal ring: containing 2.7 mg + 11.7 mg
progesterone vaginal ring*	Progesterone-releasing vaginal ring: containing 2.074 g of micronized progesterone. *For use in women actively breastfeeding at least 4 times per day

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22.2 Ovulation inducers	
<i>Complementary List</i>	
clomifene	<i>Tablet:</i> 50 mg (citrate).
<input type="checkbox"/> letrozole Therapeutic alternatives: - anastrozole	<i>Solid oral dosage form:</i> 2.5 mg.
22.3 Uterotonics	
carbetocin	<i>Injection (heat stable):</i> 100 micrograms/mL.
<input type="checkbox"/> ergometrine Therapeutic alternatives: - methylergometrine	<i>Injection:</i> 200 micrograms (hydrogen maleate) in 1 mL ampoule.
mifepristone – misoprostol Where permitted under national law and where culturally acceptable.	<i>Tablet</i> 200 mg – <i>tablet</i> 200 micrograms. Co-package containing: mifepristone 200 mg tablet [1] and misoprostol 200 micrograms tablet [4] <ul style="list-style-type: none">– Management of intrauterine fetal demise;– Management of induced abortion
misoprostol	<i>Tablet:</i> 200 micrograms. <ul style="list-style-type: none">– Management of incomplete abortion and miscarriage;– Prevention and treatment of postpartum haemorrhage where oxytocin is not available or cannot be safely used Vaginal tablet: 25 micrograms.* *Only for use for induction of labour where appropriate facilities are available.
oxytocin	<i>Injection:</i> 10 IU in 1 mL.
22.4 Antioxytocics (tocolytics)	
nifedipine	Immediate-release capsule: 10 mg.

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22.5 Other medicines administered to the mother																															
dexamethasone	Injection: 4 mg/mL (as disodium phosphate salt) in 1 mL ampoule.																														
multiple micronutrient supplement*	<p>Tablet containing:</p> <table> <tbody> <tr><td>Vitamin A (retinol acetate)</td><td>800 micrograms retinol activity equivalent</td></tr> <tr><td>Vitamin C (ascorbic acid)</td><td>70 mg</td></tr> <tr><td>Vitamin D (cholecalciferol)</td><td>5 micrograms (200 IU)</td></tr> <tr><td>Vitamin E (alpha tocopherol succinate)</td><td>10 mg alpha tocopherol equivalent</td></tr> <tr><td>Vitamin B1 (thiamine mononitrate)</td><td>1.4 mg</td></tr> <tr><td>Vitamin B2 (riboflavin)</td><td>1.4 mg</td></tr> <tr><td>Vitamin B3 (niacinamide)</td><td>18 mg niacin equivalent</td></tr> <tr><td>Vitamin B6 (pyridoxine hydrochloride)</td><td>1.9 mg</td></tr> <tr><td>Folic acid (folic acid)</td><td>680 micrograms dietary folate equivalent (400 micrograms)</td></tr> <tr><td>Vitamin B12 (cyanocobalamin)</td><td>2.6 micrograms</td></tr> <tr><td>Iron (ferrous fumarate)</td><td>30 mg</td></tr> <tr><td>Iodine (potassium iodide)</td><td>150 micrograms</td></tr> <tr><td>Zinc (zinc oxide)</td><td>15 mg</td></tr> <tr><td>Selenium (sodium selenite)</td><td>65 micrograms</td></tr> <tr><td>Copper (cupric oxide)</td><td>2 mg</td></tr> </tbody> </table> <p>*For use in specific contexts. Refer to current WHO recommendations.</p>	Vitamin A (retinol acetate)	800 micrograms retinol activity equivalent	Vitamin C (ascorbic acid)	70 mg	Vitamin D (cholecalciferol)	5 micrograms (200 IU)	Vitamin E (alpha tocopherol succinate)	10 mg alpha tocopherol equivalent	Vitamin B1 (thiamine mononitrate)	1.4 mg	Vitamin B2 (riboflavin)	1.4 mg	Vitamin B3 (niacinamide)	18 mg niacin equivalent	Vitamin B6 (pyridoxine hydrochloride)	1.9 mg	Folic acid (folic acid)	680 micrograms dietary folate equivalent (400 micrograms)	Vitamin B12 (cyanocobalamin)	2.6 micrograms	Iron (ferrous fumarate)	30 mg	Iodine (potassium iodide)	150 micrograms	Zinc (zinc oxide)	15 mg	Selenium (sodium selenite)	65 micrograms	Copper (cupric oxide)	2 mg
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Zinc (zinc oxide)	15 mg																														
Selenium (sodium selenite)	65 micrograms																														
Copper (cupric oxide)	2 mg																														
tranexamic acid	Injection: 100 mg/mL in 10 mL ampoule.																														
22.6 Medicines administered to the neonate [c]																															
caffeine citrate [c]	Injection: 20 mg/mL (equivalent to 10 mg caffeine base/mL). Oral liquid: 20 mg/mL (equivalent to 10 mg caffeine base/mL).																														
chlorhexidine [c]	Solution or gel: 7.1% (digluconate) delivering 4% chlorhexidine (for umbilical cord care).																														
<i>Complementary List</i>																															
<input type="checkbox"/> ibuprofen [c] <i>Therapeutic alternatives:</i> - indometacin	Solution for injection: 5 mg/mL.																														
<input type="checkbox"/> prostaglandin E1 [c] <i>Therapeutic alternatives:</i> - prostaglandin E2	Solution for injection: 0.5 mg/mL in alcohol.																														
surfactant [c]	Suspension for intratracheal instillation: 25 mg/mL or 80 mg/mL.																														
23. PERITONEAL DIALYSIS SOLUTION																															
<i>Complementary List</i>																															
intraperitoneal dialysis solution	Parenteral solution: of appropriate composition.																														

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24. MEDICINES FOR MENTAL AND BEHAVIOURAL DISORDERS	
24.1 Medicines for psychotic disorders	
<input type="checkbox"/> fluphenazine Therapeutic alternatives: - haloperidol decanoate - zuclopentixol decanoate	Injection: 25 mg (decanoate or enantate) in 1 mL ampoule.
<input type="checkbox"/> haloperidol Therapeutic alternatives: - chlorpromazine	Tablet: 2 mg; 5 mg.
haloperidol	Injection: 5 mg/mL in 1 mL ampoule.
olanzapine	Powder for injection: 10 mg in vial.
<input type="checkbox"/> paliperidone Therapeutic alternatives: - risperidone injection	Injection (prolonged-release): 25 mg; 50 mg; 75 mg; 100 mg; 150 mg (as palmitate) in pre-filled syringe.
<input type="checkbox"/> risperidone Therapeutic alternatives: - aripiprazole - olanzapine - paliperidone - quetiapine	Solid oral dosage form: 0.25 mg to 6.0 mg.
<i>Complementary List</i>	
clozapine	Solid oral dosage form: 25 to 200 mg.
24.2 Medicines for mood disorders	
24.2.1 Medicines for depressive disorders	
amitriptyline	Tablet: 25 mg; 75mg (hydrochloride).
<input type="checkbox"/> fluoxetine Therapeutic alternatives: - citalopram - escitalopram - fluvoxamine - paroxetine - sertraline	Solid oral dosage form: 20 mg (as hydrochloride).
24.2.2 Medicines for bipolar disorders	
carbamazepine	Tablet (scored): 100 mg; 200 mg; 400 mg.
lithium carbonate	Solid oral dosage form: 300 mg.
<input type="checkbox"/> quetiapine Therapeutic alternatives: - aripiprazole - olanzapine - paliperidone	Tablet (immediate-release): 25 mg; 100 mg; 150 mg; 200 mg; 300 mg. Tablet (modified-release): 50 mg; 150 mg; 200 mg; 300 mg; 400 mg.

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<p>valproic acid (sodium valproate)*</p> <p><i>*avoid use in pregnancy and in women and girls of child-bearing potential, unless alternative treatments are ineffective or not tolerated because of the high risk of birth defects and developmental disorders in children exposed to valproate in the womb.</i></p>	<p>Tablet (enteric-coated): 200 mg; 500 mg.</p>
24.3 Medicines for anxiety disorders	
<p><input type="checkbox"/> diazepam*</p> <p>Therapeutic alternatives: - lorazepam</p>	<p>Tablet (scored): 2 mg; 5 mg.</p> <p>*For short-term emergency management of acute and severe anxiety symptoms only</p>
<p><input type="checkbox"/> fluoxetine</p> <p>Therapeutic alternatives: - citalopram - escitalopram - fluvoxamine - paroxetine - sertraline</p>	<p>Solid oral dosage form: 20 mg (as hydrochloride).</p>
24.4 Medicines for obsessive compulsive disorders	
<p>clomipramine</p>	<p>Capsule: 10 mg; 25 mg (hydrochloride).</p>
<p><input type="checkbox"/> fluoxetine</p> <p>Therapeutic alternatives: - citalopram - escitalopram - fluvoxamine - paroxetine - sertraline</p>	<p>Solid oral dosage form: 20 mg (as hydrochloride).</p>
24.5 Medicines for disorders due to psychoactive substance use	
24.5.1 Medicines for alcohol use disorders	
<p>acamprosate calcium</p>	<p>Tablet: 333 mg</p>
<p>naltrexone</p>	<p>Injection suspension (extended-release): 380 mg in vial Tablet: 50 mg</p>
24.5.2 Medicines for nicotine use disorders	
<p>bupropion</p>	<p>Tablet (sustained-release): 150 mg (hydrochloride).</p>
<p>nicotine replacement therapy (NRT)</p>	<p>Chewing gum: 2 mg; 4 mg (as polacrilex). Lozenge: 2 mg; 4 mg. Oral spray: 1 mg per actuation. Transdermal patch: 5 mg to 30 mg/16 hrs; 7 mg to 21 mg/24 hrs.</p>
<p>varenicline</p>	<p>Tablet: 0.5 mg, 1 mg</p>

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24.5.3 Medicines for opioid use disorders	
Complementary List	
<input type="checkbox"/> methadone* Therapeutic alternatives: <ul style="list-style-type: none"> - buprenorphine 	Concentrate for oral liquid: 5 mg/mL; 10 mg/mL (hydrochloride). Oral liquid: 5 mg/5 mL; 10 mg/5 mL (hydrochloride). <small>*The medicines should only be used within an established support programme.</small>
25. MEDICINES ACTING ON THE RESPIRATORY TRACT	
25.1 Antiasthmatic medicines and medicines for chronic obstructive pulmonary disease	
<input type="checkbox"/> budesonide Therapeutic alternatives: <ul style="list-style-type: none"> - beclometasone - ciclesonide - flunisolide - fluticasone - mometasone 	Inhalation (aerosol): 100 micrograms per dose; 200 micrograms per dose.
<input type="checkbox"/> budesonide + <input type="checkbox"/> formoterol Therapeutic alternatives: <ul style="list-style-type: none"> - beclometasone + formoterol - budesonide + salmeterol - fluticasone + formoterol - fluticasone furoate + vilanterol - mometasone + formoterol 	Dry powder inhaler: 100 micrograms + 6 micrograms per dose; 200 micrograms + 6 micrograms per dose.
epinephrine (adrenaline)	Injection: 1 mg/mL (as hydrochloride or hydrogen tartrate) in 1 mL ampoule.
ipratropium bromide	Inhalation (aerosol): 20 micrograms/metered dose.
<input type="checkbox"/> salbutamol Therapeutic alternatives: <ul style="list-style-type: none"> - terbutaline 	Inhalation (aerosol): 100 micrograms (as sulfate) per dose. Injection: 50 micrograms/mL (as sulfate) in 5 mL ampoule. Metered dose inhaler (aerosol): 100 micrograms (as sulfate) per dose. Respirator solution for use in nebulizers: 5 mg/mL (as sulfate).
<input type="checkbox"/> tiotropium Therapeutic alternatives: <ul style="list-style-type: none"> - aclidinium - glycopyrronium - umeclidinium 	Powder for inhalaton, capsule: 18 micrograms. Inhalation solution: 1.25 micrograms; 2.5 micrograms per actuation.
26. SOLUTIONS CORRECTING WATER, ELECTROLYTE AND ACID–BASE DISTURBANCES	
26.1 Oral	
oral rehydration salts	See section 17.5.1.
potassium chloride	Powder for solution.
26.2 Parenteral	
glucose	Injectable solution: 5% (isotonic); 10% (hypertonic); 50% (hypertonic).

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glucose with sodium chloride	Injectable solution: 4% glucose, 0.18% sodium chloride (equivalent to Na ⁺ 30 mmol/L, Cl ⁻ 30 mmol/L). Injectable solution: 5% glucose, 0.9% sodium chloride (equivalent to Na ⁺ 150 mmol/L and Cl ⁻ 150 mmol/L); 5% glucose, 0.45% sodium chloride (equivalent to Na ⁺ 75 mmol/L and Cl ⁻ 75 mmol/L) [c].
potassium chloride	Solution: 11.2% in 20 mL ampoule (equivalent to K ⁺ 1.5 mmol/mL, Cl ⁻ 1.5 mmol/mL). Solution for dilution: 7.5% (equivalent to K 1 mmol/mL and Cl 1 mmol/mL) [c]; 15% (equivalent to K 2 mmol/mL and Cl 2 mmol/mL) [c].
sodium chloride	Injectable solution: 0.9% isotonic (equivalent to Na ⁺ 154 mmol/L, Cl ⁻ 154 mmol/L).
sodium hydrogen carbonate	Injectable solution: 1.4% isotonic (equivalent to Na ⁺ 167 mmol/L, HCO ₃ ⁻ 167 mmol/L). Solution: 8.4% in 10 mL ampoule (equivalent to Na ⁺ 1000 mmol/L, HCO ₃ ⁻ 1000 mmol/L).
sodium lactate, compound solution	Injectable solution.
26.3 Miscellaneous	
water for injection	2 mL; 5 mL; 10 mL ampoules.
27. VITAMINS AND MINERALS	
ascorbic acid	Tablet: 50 mg.
calcium	Tablet: 500 mg (elemental).
<input type="checkbox"/> colecalciferol [c] Therapeutic alternatives: - ergocalciferol	Oral liquid: 400 IU/mL. Solid oral dosage form: 400 IU; 1000 IU.
<input type="checkbox"/> ergocalciferol Therapeutic alternatives: - colecalciferol	Oral liquid: 250 micrograms/mL (10 000 IU/mL). Solid oral dosage form: 1.25 mg (50 000 IU).
iodine	Capsule: 190 mg. Iodized oil: 1 mL (480 mg iodine); 0.5 mL (240 mg iodine) in ampoule (oral or injectable); 0.57 mL (308 mg iodine) in dispenser bottle.
multiple micronutrient powder [c]	Sachets containing: - iron (elemental) 12.5 mg (as coated ferrous fumarate) - zinc (elemental) 5 mg - vitamin A 300 micrograms - with or without other micronutrients at recommended daily values
nicotinamide	Tablet: 50 mg.
pyridoxine	Tablet: 25 mg (hydrochloride).

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retinol	Capsule: 50 000 IU; 100 000 IU; 200 000 IU (as palmitate). Oral oily solution: 100 000 IU/mL (as palmitate) in multidose dispenser. Tablet (sugar-coated): 10 000 IU (as palmitate). Water-miscible injection: 100 000 IU (as palmitate) in 2 mL ampoule.
riboflavin	Tablet: 5 mg.
thiamine	Tablet: 50 mg (hydrochloride).
Complementary List	
calcium gluconate	Injection: 100 mg/mL in 10 mL ampoule.
28. EAR, NOSE AND THROAT MEDICINES	
acetic acid [c]	Topical: 2%, in alcohol.
<input type="checkbox"/> budesonide [c] Therapeutic alternatives to be reviewed	Nasal spray: 100 micrograms per dose.
<input type="checkbox"/> ciprofloxacin [c] Therapeutic alternatives: - ofloxacin	Solution (ear drops): 0.3% (as hydrochloride).
<input type="checkbox"/> xylometazoline <input type="checkbox"/> [c] Therapeutic alternatives to be reviewed	Nasal spray: 0.05%. <input type="checkbox"/> Not in children less than 3 months.
29. MEDICINES FOR DISEASES OF JOINTS	
29.1 Medicines used to treat gout	
allopurinol	Tablet: 100 mg.
29.2 Disease-modifying anti-rheumatic drugs (DMARDs)	
chloroquine	Tablet: 100 mg; 150 mg (as phosphate or sulfate).
Complementary List	
azathioprine	Tablet: 50 mg.
hydroxychloroquine	Solid oral dosage form: 200 mg (as sulfate).
methotrexate	Tablet: 2.5 mg (as sodium).
penicillamine	Solid oral dosage form: 250 mg.
sulfasalazine	Tablet: 500 mg.
29.3 Medicines for juvenile joint diseases	
Complementary List	
acetylsalicylic acid* (acute or chronic use)	Suppository: 50 mg to 150 mg. Tablet: 100 mg to 500 mg. *For use for rheumatic fever, juvenile arthritis, Kawasaki disease.

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<p>o <i>adalimumab*</i></p> <p><i>Therapeutic alternatives*:</i></p> <ul style="list-style-type: none"> - <i>certolizumab pegol</i> - <i>etanercept</i> - <i>golimumab</i> - <i>infliximab</i> <p>*including quality-assured biosimilars</p>	<p>Injection: 10 mg/0.2 mL [c]; 20 mg/0.4 mL [c]; 40 mg/0.8 mL; 40 mg/0.4 mL.</p>
<p><i>methotrexate</i></p>	<p>Tablet: 2.5 mg (as sodium).</p>
<p><input type="checkbox"/> <i>triamicinolone hexacetonide</i></p> <p><i>Therapeutic alternatives:</i></p> <ul style="list-style-type: none"> - <i>triamicinolone acetonide</i> 	<p>Injection: 20 mg/mL in vial.</p>

30. DENTAL MEDICINES AND PREPARATIONS

<p>fluoride</p>	<p>Gel: containing 2500 to 12 500 ppm fluoride (any type). Mouthrinse: containing 230 to 900 ppm fluoride (any type). Toothpaste, cream or gel: containing 1000 to 1500 ppm fluoride (any type). Varnish: containing 22 500 ppm fluoride (any type).</p>
<p>glass ionomer cement</p>	<p>Single-use capsules: 0.4 g powder + 0.09 mL liquid. Multi-use bottle: powder + liquid. Powder (fluoro-alumino-silicate glass) contains: 25-50% silicate, 20-40% aluminium oxide, 1-20% fluoride, 15-40% metal oxide, 0-15% phosphate, remainder are polyacrylic acid powder and metals in minimal quantities. Liquid (aqueous) contains: 7-25% polybasic carboxylic acid, 45-60% polyacrylic acid.</p>
<p>resin-based composite (low-viscosity)*</p>	<p>Single-use applicator or multi-use bottle *of any type for use as dental sealant</p>
<p>resin-based composite (high-viscosity)*</p>	<p>Single-use capsule or multi-use syringe *of any type for use as dental filling material</p>
<p>silver diamine fluoride</p>	<p>Solution: 38% w/v.</p>

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Table 1.1: Medicines with age or weight restrictions

artesunate + pyronaridine tetraphosphate	> 5 kg
atropine	> 3 months
benzyl benzoate	>2 years
betamethasone topical preparations	hydrocortisone preferred in neonates
cefazolin	> 1 month
ceftriaxone	> 41 weeks corrected gestational age
darunavir	> 3 years
dihydroartemisinin + piperaquine phosphate	> 5 kg
diloxanide	>25 kg
dolutegravir	≥ 4 weeks and ≥ 3 kg (10 mg dispersible tablet) ≥ 25 kg (50 mg tablet)
doxycycline	> 8 years (except for serious infections e.g. cholera)
ibuprofen	> 3 months (except IV form for patent ductus arteriosus)
mefloquine	> 5 kg or > 3 months
metoclopramide	Not in neonates
nevirapine	> 6 weeks
ondansetron	> 1 month
silver sulfadiazine	> 2 months
tetracaine	Not in preterm neonates
xylometazoline	> 3 months

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Table 1.2: Explanation of dosage forms

A. Principal dosage forms used in EML – oral administration

Term	Definition
Solid oral dosage form	<p>Refers to tablets or capsules or other solid dosage forms such as 'melts' that are immediate-release preparations. It implies that there is no difference in clinical efficacy or safety between the available dosage forms, and countries should therefore choose the form(s) to be listed depending on quality and availability.</p> <p>The term 'solid oral dosage form' is <i>never</i> intended to allow any type of modified-release tablet.</p>
Tablets	<p>Refers to:</p> <ul style="list-style-type: none"> • uncoated or coated (film-coated or sugar-coated) tablets that are intended to be swallowed whole; • unscored and scored*; • tablets that are intended to be chewed before being swallowed; • tablets that are intended to be dispersed or dissolved in water or another suitable liquid before being swallowed; • tablets that are intended to be crushed before being swallowed. <p>The term 'tablet' without qualification is <i>never</i> intended to allow any type of modified-release tablet.</p>
Tablets (qualified)	<p>Refers to a specific type of tablet:</p> <p>chewable - tablets that are intended to be chewed before being swallowed;</p> <p>dispersible - tablets that are intended to be dispersed in water or another suitable liquid before being swallowed;</p> <p>soluble - tablets that are intended to be dissolved in water or another suitable liquid before being swallowed;</p> <p>crushable - tablets that are intended to be crushed before being swallowed;</p> <p>scored - tablets bearing a break mark or marks where sub-division is intended in order to provide doses of less than one tablet;</p> <p>sublingual - tablets that are intended to be placed beneath the tongue.</p> <p>The term 'tablet' is <i>always</i> qualified with an additional term (in parentheses) in entries where one of the following types of tablet is intended: gastro-resistant (such tablets may sometimes be described as enteric-coated or as delayed-release), prolonged-release or another modified-release form.</p>

* Scored tablets may be divided for ease of swallowing, provided that dose is a whole number of tablets.

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Capsules	Refers to hard or soft capsules. The term 'capsule' without qualification is <i>never</i> intended to allow any type of modified-release capsule.
Capsules (qualified)	The term 'capsule' with qualification refers to gastro-resistant (such capsules may sometimes be described as enteric-coated or as delayed-release), prolonged-release or another modified-release form.
Granules	Preparations that are issued to patient as granules to be swallowed without further preparation, to be chewed, or to be taken in or with water or another suitable liquid. The term 'granules' without further qualification is <i>never</i> intended to allow any type of modified-release granules.
Oral powder	Preparations that are issued to patient as powder (usually as single-dose) to be taken in or with water or another suitable liquid.
Oral liquid	Liquid preparations intended to be <i>swallowed</i> i.e. oral solutions, suspensions, emulsions and oral drops, including those constituted from powders or granules, but <i>not</i> those preparations intended for <i>oromucosal administration</i> e.g. gargles and mouthwashes. Oral liquids presented as powders or granules may offer benefits in the form of better stability and lower transport costs. If more than one type of oral liquid is available on the same market (e.g. solution, suspension, granules for reconstitution), they may be interchanged and in such cases should be bioequivalent. It is preferable that oral liquids do not contain sugar and that solutions for children do not contain alcohol.

B. Principal dosage forms used in EML – parenteral administration

Term	Definition
Injection	Refers to solutions, suspensions and emulsions including those constituted from powders or concentrated solutions.
Injection (qualified)	Route of administration is indicated in parentheses where relevant.
Injection (oily)	The term 'injection' is qualified by '(oily)' in relevant entries.
Intravenous infusion	Refers to solutions and emulsions including those constituted from powders or concentrated solutions.

C. Other dosage forms

Mode of administration	Term to be used
To the eye	Eye drops, eye ointments.
Topical	For liquids: lotions, paints. For semi-solids: cream, ointment.
Rectal	Suppositories, gel or solution.
Vaginal	Pessaries or vaginal tablets.
Inhalation	Powder for inhalation, pressurized inhalation, nebulizer.

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