

# 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 21 to 22.)
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. For difficulty breathing, see pages 4 to 6.
4. After breathing, **check for bleeding**. Heavy bleeding can kill. See pages 8 to 10.

### Protect yourself

Try to keep blood and body fluids off yourself when you care for people who are bleeding.

- **Wash your hands as often as you can.** Flushing out any blood that gets in your eyes or into a cut in your skin can 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. See Care for Sick People (in development) for more about protecting yourself from germs.



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. It is common to have more than one injury, and some are not obvious at first glance.
6. Try to be as gentle and comforting as you can. The injured person is likely scared and in pain. By calming him, you can help his breathing and heart rate return to normal.

Re-check breathing and bleeding often. If you can check his blood pressure, check it often. An injured person may seem fine at first and then suddenly get worse. Regularly re-check these most important signs of life until you are sure he is OK. Keep talking to him. This will help you see if he is confused or if his 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 or get supplies like cloth (for bandages), or blankets. Give everyone a job to keep them calm and to make sure all the urgent work gets done. If many people have been injured, see *Disasters and Displacement (in development)* for how to decide who to help first.

The injured person can also help herself. Most bleeding people can put pressure on their own wounds (see page 8). This can focus the person and allows you to check for other injuries or to care for other injured people.

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

**Ask or notice** if they are having trouble breathing. If the person is choking see page 4.

**Notice** if they seem confused or have trouble speaking clearly. This can help you to assess how badly injured they are. If the person is unconscious see page 7.

- ➔ These are signs of sprains or broken bones (page 25, and 28 to 35). If there is numbness or difficulty moving the lower body or the whole body, there may be a spine injury (pages 21 to 22).
- ➔ Stabbing pain with breathing may be a broken rib (see page 25).
- ➔ Shortness of breath, chest tightness, and wheezing are signs of asthma (see Problems with Breathing and Coughing—in development).
- ➔ Trouble breathing can be caused by chemical poisoning or drug overdose, see pages 45 to 47.
- ➔ Many people become confused after an accident. But unclear speech, unconsciousness, and lasting confusion can be signs of head injury (pages 22 to 24) or drug or alcohol use (see page 47).
- ➔ Slurred or strange speech can also be a sign of stroke. Is one side of their face or body drooping or does it seem weak? See Head and Brain Problems (in development).
- ➔ Confusion or changes in consciousness can also be a sign of a diabetic emergency. See page 48 if the person became ill suddenly.

**? 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.

- ➔ For bleeding, see pages 8 to 10.
- ➔ For possible broken bones, see pages 25, and 28 to 32.
- ➔ Bruising, swelling, and redness can be signs of bleeding inside the body. Watch for shock, page 10.

**? 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.

- ➔ For signs of head injury, see pages 22 to 24.
- ➔ If you suspect there may be an injury to the head, neck, or back, see pages 21 to 22 before you move the person.
- ➔ Bruising, swelling, and redness can be signs of bleeding inside the body. Watch for shock, page 10.

# Breathing

## Choking



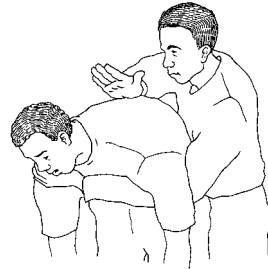
*If the person can cough or talk, he can breathe.*

A choking person who cannot cough or cannot talk also cannot breathe. You can save his life by helping quickly.

### 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:

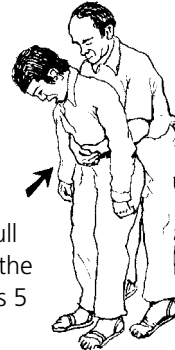


### Give abdominal thrusts

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 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 push hard and fast on the middle of his chest until he starts 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.




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*If you cannot clear the airway for a baby, child, or adult, give rescue breathing.*

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## Drowning

Get the person out of the water as fast as you can and immediately start rescue breathing (page 6) and chest compressions (page 7). 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.

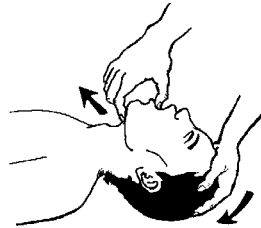
## Rescue breathing

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 7).

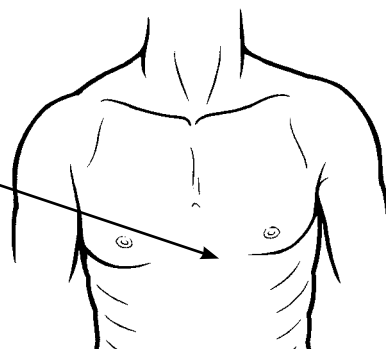
**If you do feel or hear a pulse**, keep giving breaths until he breathes on his own. It may take 30 minutes or more.



## No Heartbeat

Feel for a heartbeat on the neck (see page 6).  
Or listen on the left side of the chest, here:

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 (see page 6).

### 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. (For more about heart attacks, see page 27.)

A medical device called a defibrillator gives an electric shock to re-start the heart after a heart attack. Find out if there are defibrillators in your community and where they are kept before emergencies happen. 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 24.

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.

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

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Never use dirt, kerosene, lime, or 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 10).

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.

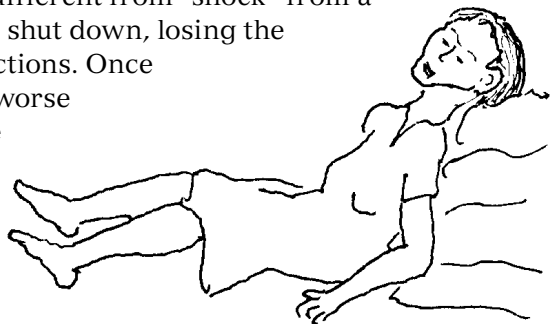
**Step 5:**

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.



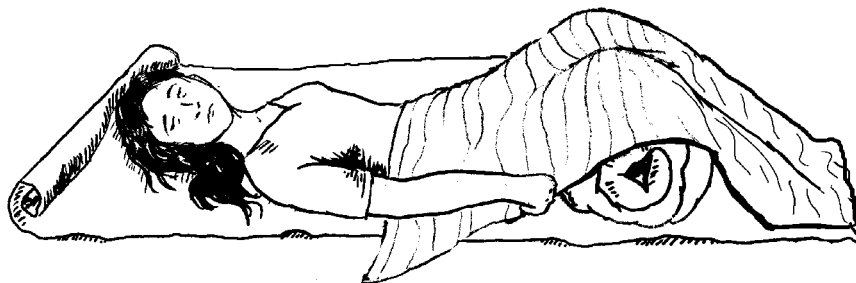
**SIGNS**

- 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 8). For dehydration, give rehydration drink (page 22 of Belly Pain, Diarrhea, and Worms). If the cause of shock is sepsis (an infection that spread to the bloodstream), antibiotics are needed immediately (see page 19).
- Keep the person warm (or remove some clothes if the person is hot).
- Raise the legs, supporting the knees.
- If the person can hold a cup, give drinks of water or rehydration drink.
- Keep calm and reassure the person.
- Give rectal fluids or IV fluids (see Health Worker Skills – in development) on your way to medical help.



# Wounds

1. Stop the bleeding with pressure (page 8).
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 85) 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

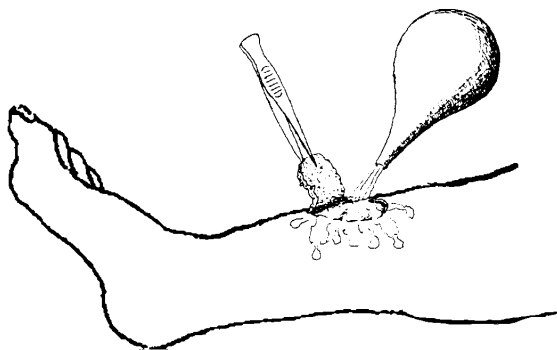
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*Any wound, big or small, can become infected. Clean every wound well.*

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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 redness, increasing pain, warmth, swelling, 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 18).

## 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.

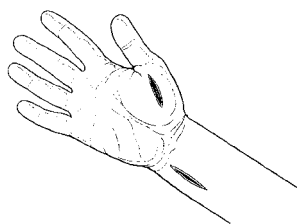
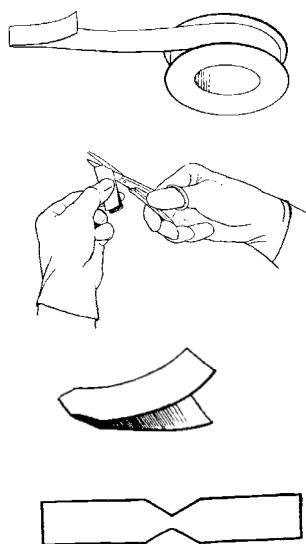
A wound that is more than 12 hours old should be cleaned and left open to heal.

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

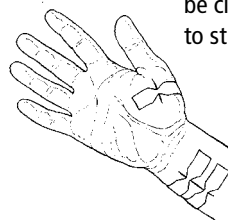
To close a shallow, clean wound, use butterfly bandages, glue, or stitches.

### 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.

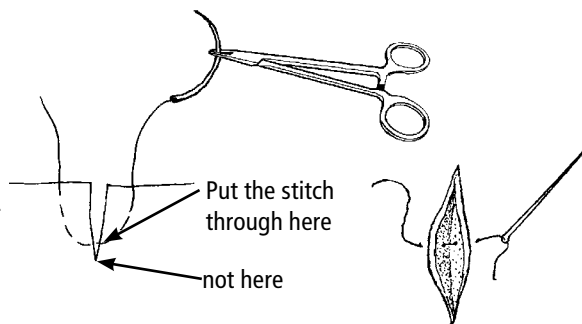
Line up the edges. The edges of the wound should come up slightly above the skin instead of tucking into the wound.

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

### Step 1:

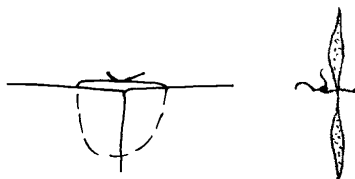
Put the stitch through the cut, not under the cut.

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:

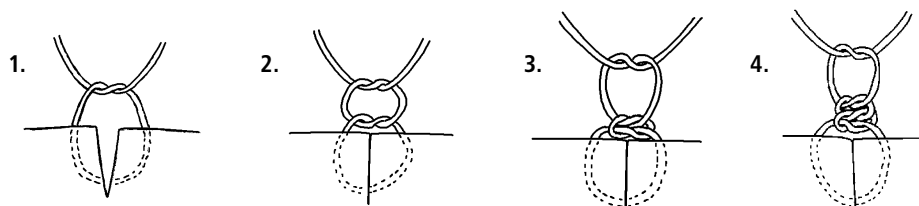
Make enough stitches to close the whole cut.

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 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

Many deep wounds should 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 bottom up.

Deep wounds can develop a tetanus infection, see page 20. The person should get a tetanus vaccine (see Vaccines – in development) and an antitoxin for tetanus (see page 73).

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

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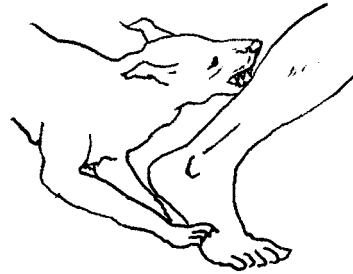
*Never close animal bites, puncture wounds, or rough, messy wounds.*

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### 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 antibiotics (see page 74).

For dog, monkey, bat and raccoon bites, get a rabies vaccination and immunoglobulin immediately, see page 74. Signs of rabies are very similar to the flu, but unlike the flu, rabies is deadly. So if you do not have rabies vaccination or immunoglobulin, contact your national health ministry immediately.



### Knife wounds

Deep knife wounds should usually be kept open and cleaned often. Give cloxacillin (page 64) or clindamycin (page 68) at any sign of infection.

Knife wounds to the chest or belly can be very dangerous. Get medical help. For what to do on the way, see page 25 for a knife wound to the chest, or page 26 for a knife wound to the belly.



## Gunshot Wounds

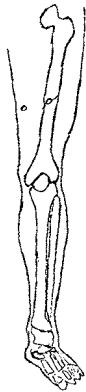
Follow the directions on page 8 to stop bleeding with direct pressure—both where the bullet entered and where it exited. If there is no exit wound, the bullet will have to be removed. Get medical help.



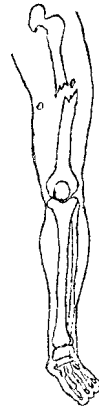
In all cases, wash the wound well and give cloxacillin (page 64), clindamycin (page 68), OR cephalixin (page 71).

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

Gunshot wounds are likely to become infected. Get medical help if possible, even before any signs of infection appear.



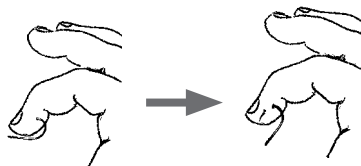
If there is any chance that the bullet hit a bone, the bone may be cracked or broken through. Splint the limb and do not use it for several weeks. See broken bones, pages 28 to 32.



## Fish hooks

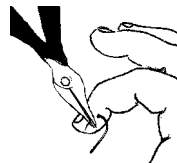
### Step 1:

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

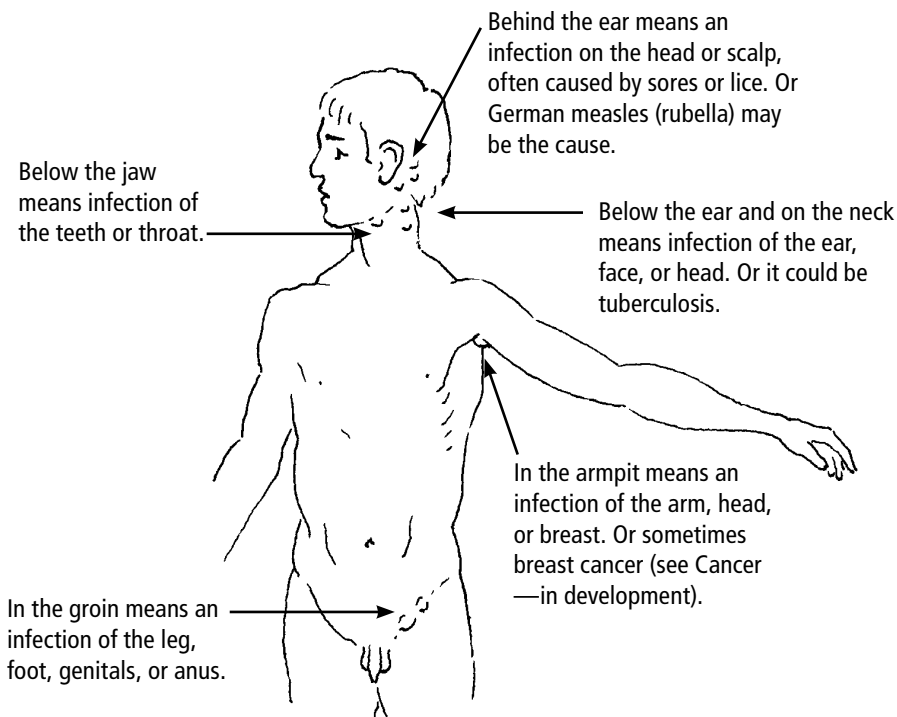
The wound is infected if it:

- 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. For more on abscesses see Problems with Skin (in development). Unless the infected area is small and getting better fast, it is usually wise to give antibiotics. Give dicloxacillin (see page 65), cephalexin (see page 71), OR clindamycin (see page 68). If the wound is deep, give a tetanus vaccination (see Vaccines – in development) and tetanus immunoglobulin (see page 73).

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 10)
- Give ceftriaxone (page 71), OR ciprofloxacin (page 70) plus clindamycin (page 68).
- Clean any infected wounds, remove dead skin, drain abscesses and pus. To learn how to drain an abscess, see Problems with Skin (in development).
- 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**

- Sweating.
- Fast pulse.
- Tense 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.

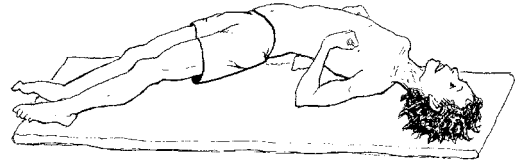
Get medical help fast for these signs!

## **PREVENTION**

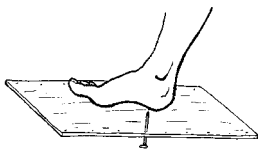
Tetanus is much easier to prevent than to treat. Vaccination and good wound cleaning are the best prevention. For a vaccination schedule, see Vaccines (in development).

## **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 reused, unsterilized needles can also lead to tetanus.



Signs of tetanus can start a day or weeks after an injury



Clean these wounds well and give antitetanus immunoglobulin (page 73) if tetanus vaccinations are not up to date. Also give metronidazole (page 69).

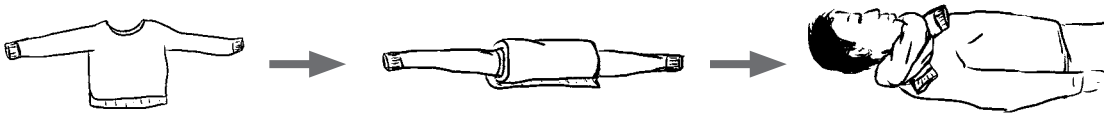
## **Newborn tetanus**

Newborns become infected with tetanus through the umbilical cord. You can protect infants by cutting the cord with a boiled blade, by keeping the cord clean, and by vaccinating the pregnant mother. See Vaccines (in development).

# 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 10). 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, move his arm or place something else under his head so he can stay on his side.)

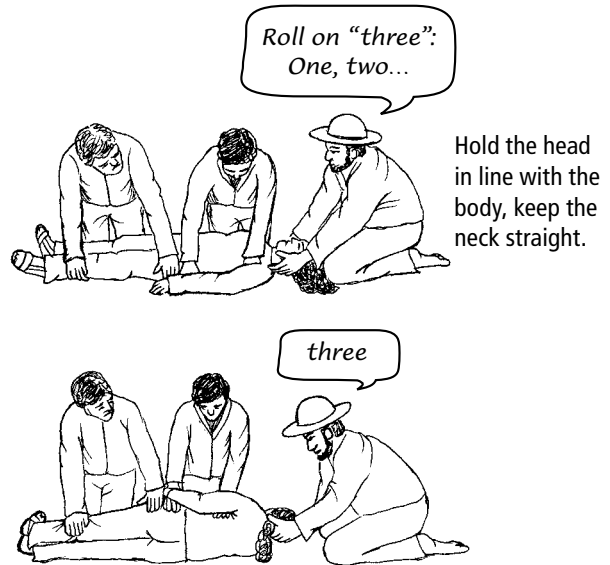
If there is pain or tenderness, the person needs x-rays to see if there are smaller breaks in the bones. He will need to rest in one position, being turned every few hours but keeping the neck and back still, until pain subsides in a week or so.

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 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 21), 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

Rest for about 24 hours and take a mild painkiller such as paracetamol or acetaminophen, 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.

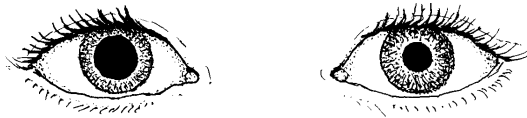
**SIGNS OF SEVERE BRAIN INJURY**

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
- Irregular (very slow or very fast) heart rate
- 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

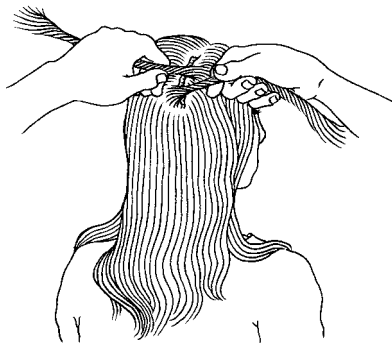


- Bruises around both eyes or behind the ear



## 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 nose bleeds 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.



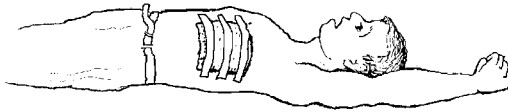


# Chest Wounds and Broken Ribs

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 the 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.



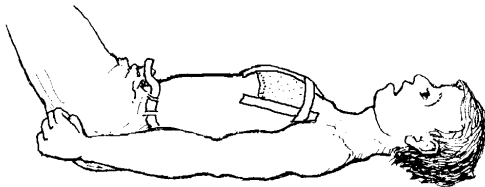
A fall or crushing injury can break many ribs at once.

2. Lie the person in whatever position best helps them breathe.
3. Watch for signs of shock (page 10) 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 get in.



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

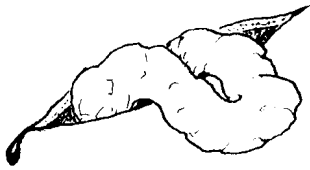
## Abdomen Injuries and Wounds

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 (pages 10 to 11) 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 Chronic Illnesses (in development).

## 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 often women do not feel chest pain.** Instead they feel shortness of breath, tiredness, nausea, vomiting, or back or jaw pain.

## TREATMENT

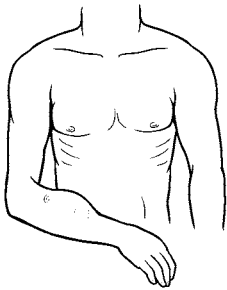
Give 1 tablet of aspirin right away. Ask the person to chew it up and swallow it with water. Even if you are not sure the person is having a heart attack, aspirin will do no harm.

If you have it, give nitroglycerine dissolved under the tongue (see page 78). Morphine helps with the pain and fear (see page 84). Reassure the person and get help.

# Broken Bones, Dislocations, and Sprains

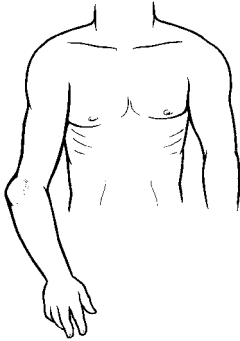
First decide if the bone is broken or dislocated (out of joint), or if the muscles are sprained. It can be very hard to tell these injuries apart, and an x-ray may be necessary to know for sure. If you cannot tell if it is broken, dislocated or sprained, keep the body part still and get help. It is also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

Give a pain killer such as acetaminophen or ibuprofen to help with the pain.



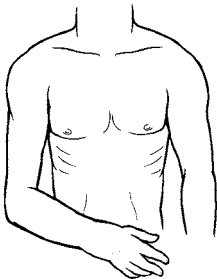
## Broken

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.



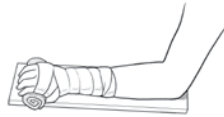
**Step 2:**

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



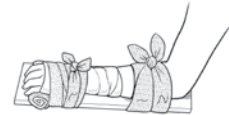
**Step 3:**

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

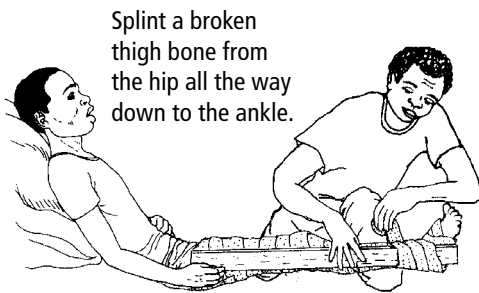


**Step 4:**

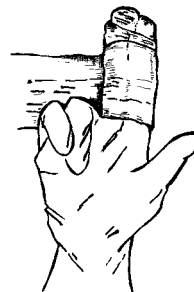
Wrap around the splint with a bandage or strip of fabric to hold it in place.



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



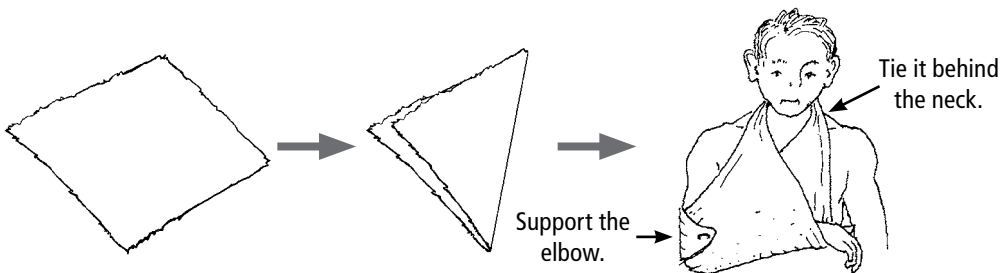
Splint a broken thigh bone from the hip all the way down to the ankle.



Splint a finger or toe to the one next to it. Put a little soft padding in between them.

### Make a sling

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



Tie it behind the neck.

Support the elbow.

## Set a bone

Wait for the swelling to go away before you 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. If possible, someone with experience should set a bone. Many communities have experienced bonesetters or community health workers who know how to do this well.

### Step 1:

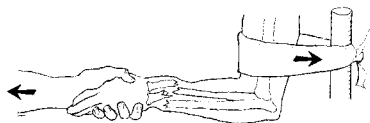
First give pain medicine (see page 81). You can also give an anti-anxiety medicine like lorazepam or diazepam to help the person stay calm (see pages 85 to 86).

### Step 2:

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

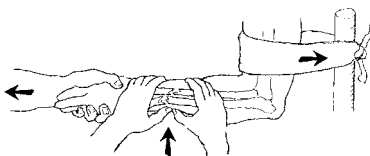
### Step 3:

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.

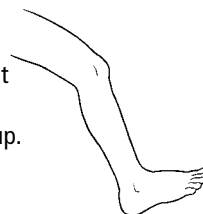
### Step 2:

Put the limb into this position:

Elbow bent,  
thumb up, and  
fingers slightly  
curved—as if  
holding a glass.



Knee slightly  
bent. Ankle 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:

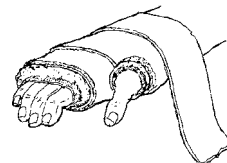
Then wrap in soft cotton or kapok. Give extra padding to bony parts, but do not over-pad, especially around the broken part.

### Step 5:

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

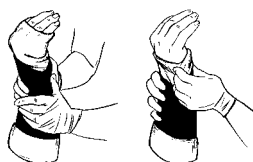
### Step 6:

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:



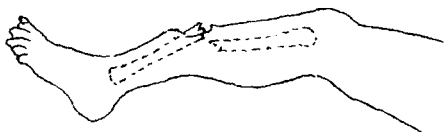
After the cast is on, rest the limb and keep it elevated when possible. Use crutches to avoid putting any weight on a broken leg.

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)



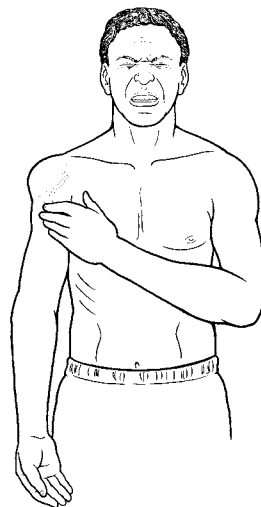
Open fractures are very likely to become infected. Clean the wound very well with lots of flowing water for 5 minutes or more. Splint the limb, give ceftriaxone (page 71), cloxacillin (page 64), clindamycin (page 68), OR cephalixin (page 71) and get help.

If you cannot get to help quickly, clean the wound very well and dress it lightly in sterile gauze. Change the gauze often. When there are no signs of infection for 3 days, set the bone, close the wound, and make a cast.

### 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.

The usual method is to pull the bone gently and slowly away from the joint, then let it “pop” back in correctly. Give an anti-anxiety medicine such as diazepam (see page 85), and a general pain medicine such as ibuprofen half an hour before you attempt to re-set the bone. If you cannot get the bone back in the joint, get help.





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.

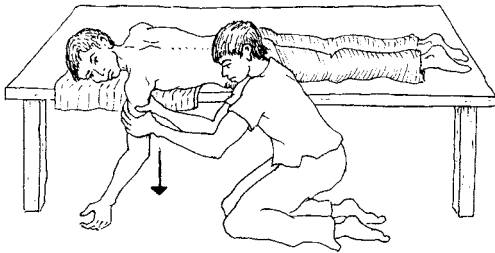
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*If pain is severe after replacing a dislocated joint, there may be a broken bone.*

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### Dislocated shoulder

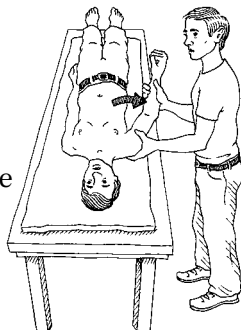
Pull the bottom of the upper arm strongly and firmly straight down. Or have the person hold a bucket with 5 or 7 kilos of water for about 15 to 20 minutes. This will pull the arm down and the shoulder should go back into place.



If the shoulder does not go back into place, gently push on the tip of the scapula (wing bones) with your thumbs. The arm should 'clunk' back into place.

OR

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:



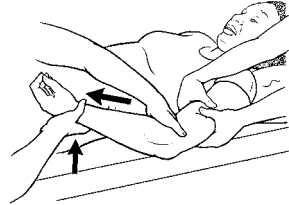
## Dislocated elbow

### Step 1:

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

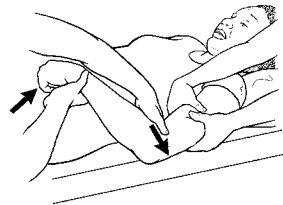
### Step 2:

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 (twisting or tearing under the skin)



### SIGNS

- Swelling
- Pain
- Bruising or redness

### TREATMENT

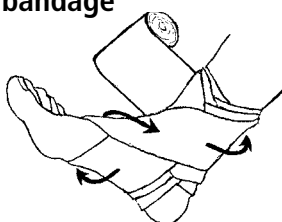
- Rest: do not put weight on the injured part. Use a sling or crutches for 3 or 4 weeks.
- Ice: for about 30 minutes every 2 to 4 hours. Less often after a few days.
- Compression: wrap firmly with a bandage.
- Elevation: elevate on a pillow or folded blankets all the time at first, and every few hours after a few days.

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

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

### How to wrap a bandage

Start near the toes  
or fingers.



Wrap firmly, but not too tight. The toes or fingers should feel warm and have normal feeling in them.

## 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. If the person recently suffered a hard blow to the head, see pages 22 to 23. If the person was struck in the abdomen, see page 26.

If you notice someone getting bruises often, or with several bruises at different stages of healing, it may be a sign of abuse. See Violence (in development).

## Rape

Sex that is not wanted or agreed to is rape. Women or girls may be raped by people they know, strangers, family members, or their husbands or boyfriends. Men and boys are also raped. For more on rape, see the chapter on Violence (in development).

Someone who has been raped will need first aid for any physical injuries. She will also need emotional support and care. Treat her with kindness and understanding. Do not blame her.

Rape can cause pregnancy. High doses of birth control pills can prevent that. See Family Planning (in development). Rape can also spread sexually transmitted infections. See Genital Problems and Infections (in development). To prevent HIV after rape, see HIV and AIDS (in development).

She may find it difficult for you to see or touch her, so explain what you will be doing as you examine or treat her and ask for her permission before touching her.



If her genitals have tears, cuts, or bruises, these will be painful. Give acetaminophen or ibuprofen. If there is a lot of bleeding in the anus or vagina, use pressure to stop the bleeding. Teach her how she can do it herself, in case bleeding starts again later.

For small cuts and tears, soak the genitals in warm water 3 times a day. Pouring water over the genitals while passing urine will help reduce burning feelings. Larger cuts or tears may need to be sutured (see pages 12 to 15).

Look for injuries to other parts of her 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 woman reports the case to the police—even if she goes to the police much later.

Follow up with the woman in a few days to see how she is doing emotionally and physically. Check cuts or tears for signs of infection (see page 18). Bladder infections (see Difficulties with Urinating—in development) are especially common after forced or violent sex.

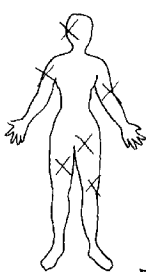
**Clinic Report**

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Patient's Statement: \_\_\_\_\_

Exam: \_\_\_\_\_



Mark down all the injuries that you find, and take photos if she gives you permission. This will help you when you follow up to make sure she is recovering. It can also be used if she decides to go to the police.

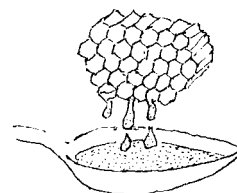
# Burns

## 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 covers 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.

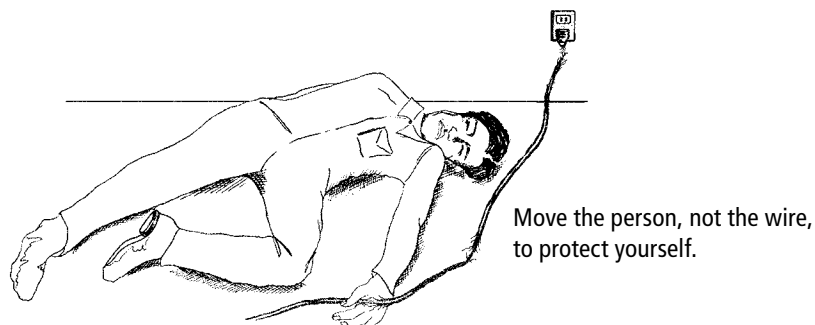
**TREATMENT**

- 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 considered best to give intravenous (IV) fluids, but large quantities of rehydration drink (page 22 in *Belly Pain, Diarrhea and Worms*) will work for someone who is alert and able to drink. Dehydration can also lead to shock, so watch for the signs listed on page 11. See *Caring for Sick People* (in development) for information on IV fluids.
- 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: the skin smells bad, has pus, becomes more red or hot, or the person gets a fever. See page 75 for information on antibiotics. Make sure tetanus vaccinations are up to date. See *Vaccines* (in development).
- 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 84 to 85). 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 75).
- Plenty of nutritious food including extra protein is needed to help a burn heal. Even though you may not feel hungry, eat 4 or more high-energy meals a day plus snacks while healing. The high-energy foods described on pages 25 to 26 of *Good Food Makes Good Health* are especially nutritious.
- 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 or can stop the heart.



1. Move the person away from the source of electricity and out of any pools of water. If the person is still touching any wires, use a piece of wood to move the wire. Do not touch any electrical wires directly until you are sure the power is turned off.
2. Electric shock can stop breathing. Give rescue breathing (see page 6).
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 7). It may take a long time. Keep trying.
4. If the person is breathing and her heart is beating, look for signs of burns. Like 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

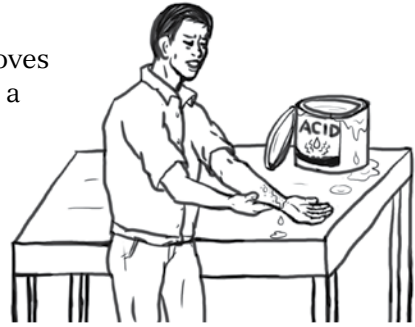
**Protect yourself first:** Wear long sleeves and gloves or bags over your hands. Cover your mouth with a handkerchief. Wash yourself and your clothing thoroughly after helping anyone who has been exposed to chemicals.

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

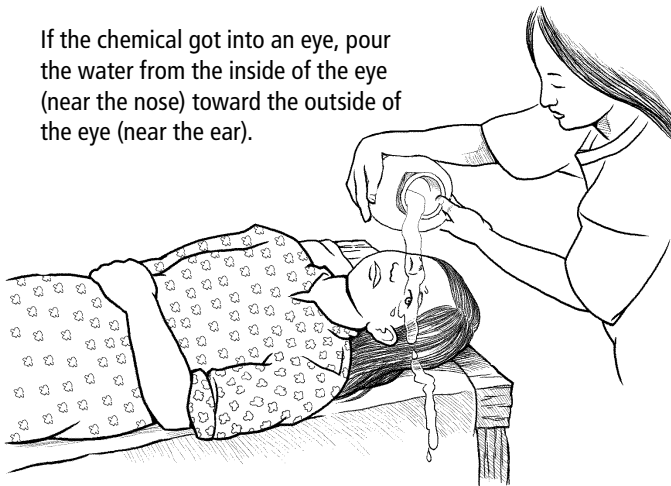
1. Take off clothing and jewelry near the burn.
2. If the chemical is sticky, quickly scrape it off with a flat stick, the side of a knife, or something else stiff.
3. Once you have scraped off all the chemical you can, **rinse the area with lots and lots of water**. Water can cause some chemicals to 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 37).

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

If you can 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.

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

A water or vinegar-soaked bandana over the mouth and nose gives a little protection.



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 from the inside (near the nose) toward the outside.
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  $\frac{1}{2}$  water,  $\frac{1}{2}$  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: faint feeling, pale skin, or weakness and see page 10. See the chapter on Eye Problems (in development) for eye injuries.

## **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. The chapter Mental Health (in development) has more information about mental illness, differences in thinking, and state of mind.

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.

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*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.

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.



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. 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.

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

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# Poison

For most poisons: quickly flush the poison out by drinking **large amounts of water**. Taking **activated charcoal** will help absorb the poison, to be eliminated later in stool. If you know the specific poison, see the chart on pages 45 to 47 for information on what to do.

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

For a child: Give 1 gram per kilogram of weight, mixed with water.

Activated charcoal is an inexpensive and very helpful remedy to keep in your medicine supply, see page 78 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.

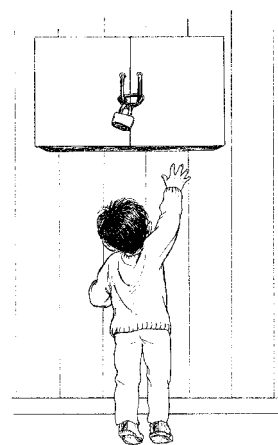
**Vomiting is not usually helpful for poisoning**, and it can be dangerous. Someone who has swallowed corrosive chemicals like acids or lye, or gasoline, kerosene, or turpentine, or who is having trouble breathing should never try to vomit up the poison.

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 (in development).



Keep all poisons out of the reach of children.

# CHEMICAL POISONING

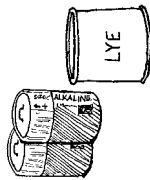
## Types of chemicals

## △ 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.

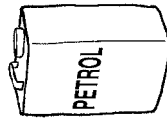
- Extra saliva.
- Pain in mouth, throat, chest, stomach, or back.
- Vomiting.
- Difficulty swallowing.

### • Do not try to vomit.

- Activated charcoal is of little use.
- Give as much water as you can. Get help.

### Hydrocarbons:

- Gasoline
- Turpentine
- Paint thinner
- Kerosene
- Phenol
- Carbolic acid
- Camphor
- Pine oil



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.

### • Do not try to vomit.

- 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 6) and watch the person's breathing for 2 days.
- Get help.

### Cyanide:

Used in: mining, factory work, animal hide hair removal (tanning), rat poison.

Can be breathed in or swallowed from contaminated food or water.



Indoor fires can cause you to breathe cyanide that was in the burning materials. You may smell bitter almond in smoke that has cyanide in it.

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

### • Do not try to vomit.

- Watch for breathing problems and try to restart the heart if it stops (pages 6 to 7).
- Do not give rescue breathing without a mask.
- Give lots of water.
- Can be treated with sodium nitrite followed by sodium thiosulfate (see page 81).

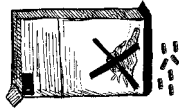
# CHEMICAL POISONING

## Types of chemicals

### Organophosphates and carbamate.

Found in certain pesticides including:

- malathion
- parathion



These chemicals can stop breathing or cause other whole-body problems.

## Signs of poisoning

- 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.

## What to do

- Watch for breathing problems and give rescue breathing if needed.
- Atropine is an antidote (see page 79).
- Give activated charcoal if it has been less than 1 hour since the poisoning (see page 78).
- Wash the skin right away and throw out contaminated clothes.
- Treat seizures with diazepam (see page 85).

### Herbicides:

- Paraquat (Gramoxone, Cyclone, Herbikill, Dextro, and many other brand names)
- Glyphosate (Roundup, Touchdown, other brand names)



Can be absorbed through the skin, by breathing it in, or most dangerously, by swallowing.

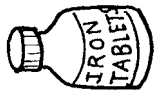
- Breathing problems (can happen days after).
- Mouth pain.
- Red or brown urine, or little or no urine (a sign that the kidney is failing—very dangerous).
- Large quantities can cause burns in the mouth and throat, stomach pain, and breathing problems.

- Watch for breathing problems and give rescue breathing if needed.
- Give activated charcoal (see page 78).
- Get help.

**Types of Drugs**      **△ Signs of overdose**      **+ What to do**

**Iron:**

- Ferrous sulfate
- Ferrous gluconate
- Prenatal vitamins
- Multivitamin pills or syrups



An overdose damages the stomach and intestines.

- Pain, vomit or bloody vomit, diarrhea, confusion.
- Shock immediately or up to 2 days later.

- Immediate vomiting may help.
- Give lots and lots of water.
- Activated charcoal is not helpful.
- Deferoxamine is an antidote (see page 80).
- Watch for breathing problems.

**Paracetamol:**

- Acetaminophen (Panadol, Tylenol, Crocin, and other brand names)
- Many combination cold medicines and pain medicines (read the label)



An overdose is poisonous to the liver.

- Nausea, sweating, pale skin, tiredness.
- Later there may be liver pain (right upper belly), jaundice, confusion, or bloody urine.

- If you can get the person to vomit right away it may be of some help.
- Give activated charcoal and lots of water.
- Acetylcysteine is an antidote (see page 80).

**Opioid medicines:**

- Morphine
  - Oxycodone
  - Heroin
  - Methadone
  - Opium
- An overdose can cause the person to stop breathing.

- Slow thinking, slow reactions, slow, shallow or stopped breathing.

- If the person is breathing fewer than 12 breaths a minute give rescue breathing (see page 6).
- Naloxone is an antidote (see page 80).
- Do not let the person drink or swallow until she is breathing well.

**Alcohol**



An overdose can cause the person to stop breathing.

- 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 48).

- Monitor the person's breathing and give rescue breathing if necessary.
- Turn him on his side to prevent choking if he vomits.
- Keep the person warm.
- If the person is able to drink, give rehydration drink (chapter 15, page 22).

## 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. For more on diabetes see the chapter on Chronic Illnesses (in development).

If you know 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 he has low blood sugar, and then take him to get medical help.

### Low blood sugar (hypoglycemia)

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:

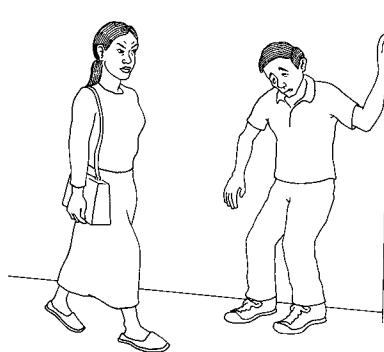
#### **DANGER SIGNS**

- 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 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, dehydration, an injury, malaria, poisoning, or other reasons. Seizures that recur are called epilepsy—see Head and Brain Problems (in development). 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). If seizures recur, 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.**

For seizure from **dehydration**, get medical help. After the seizure is over, give rehydration fluids. See page 22 of Belly Pain, Diarrhea, and Worms.

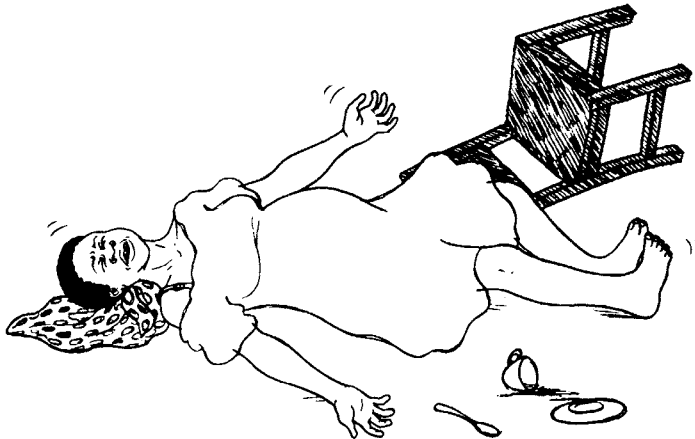
For a seizure from **meningitis**, get medical help. For more on meningitis see page 13 of Caring for Children.

For seizure from **malaria**, get medical help. On the way, give diazepam (see page 85). Treat with malaria medicines (see Some Serious Infectious Illnesses: Medicines - in development).

If the seizure lasts more than 15 minutes, put liquid diazepam in the anus using a syringe without a needle. See page 86 for doses.

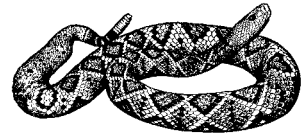
The spasms caused by **tetanus** can be mistaken for seizures. The jaw shuts tightly (lockjaw) and the body suddenly bends back. Learn to spot early signs of tetanus, see page 20.

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.

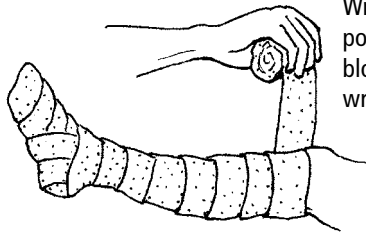
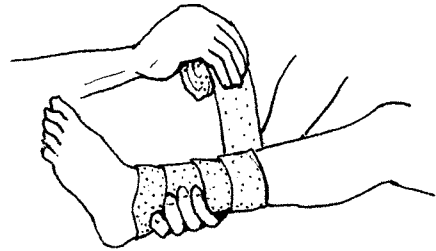
## Snake bites

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.

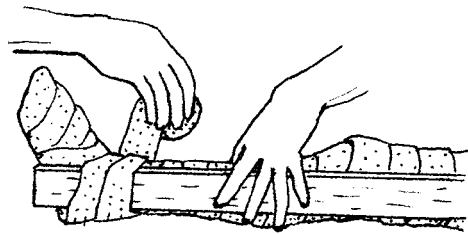
For these snakes, wrap the bitten area tightly:

- 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. Feel for a pulse under the wrapping on the top of the foot.

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.



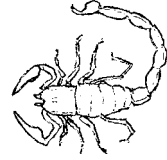
**Pythons and boas** are not poisonous, but their bites can cause severe skin infections. Watch the wound and if there are signs of infection—growing redness, heat, swelling, or pus, treat as an infected wound (see pages 18 to 19). Occasionally these snakes cause crush injuries by squeezing a person.

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 85).

## Bees and wasps

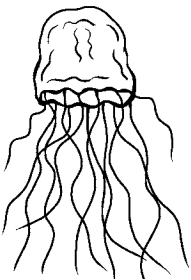
After a sting, check if a stinger was left in the skin and remove it as soon as possible. The area around the sting may get red, swollen and painful. Putting a paste made with baking soda and water, or something cold on the stung area, will help with the swelling and pain.

Severe allergy to bee or wasp stings is rare, but can be deadly. See page 54 for signs and treatment of severe allergy.

## Ticks

Ticks can spread many dangerous infections if they bite you. For more on ticks and how to safely remove them, see the Skin chapter (in development).

## 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)

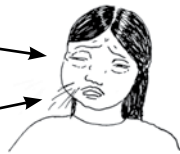
Mild allergies are caused by dust, pollen, insect bites, or certain foods, chemicals or medicines. These are usually treatable with antihistamines (see page 75).

### SIGNS OF A MILD ALLERGY

Itching, swollen,  
red eyes

Rash or redness

Sneezing



If there is an insect  
bite, it may swell



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

### SIGNS OF A SEVERE ALLERGY (ANAPHYLAXIS)

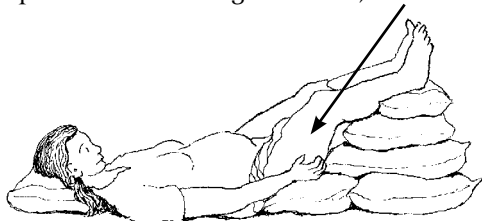
- Flushing, itching, or rash
- Swollen lips, mouth, or throat, difficulty swallowing
- Difficulty breathing
- Swollen hands or feet
- Nausea or stomachache

The most common signs are rash and breathing problems.

If the person cannot swallow, or is having trouble breathing, **give epinephrine right away**. Inject 0.3 to 0.5 mg. You can repeat the dose in 5 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. For details, see page 77.

Inject epinephrine in the thigh muscle, here:



Elevate the feet above the heart

For breathing problems you can also give salbutamol (see page 77). It is also a good idea to give an antihistamine (see page 75).

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.

## Heat Emergencies

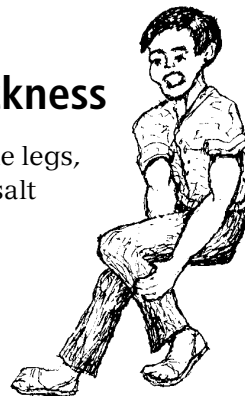
### Heat cramps, heat exhaustion, and heat sickness

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.

#### SIGNS

Heat exhaustion (heat sickness) causes:

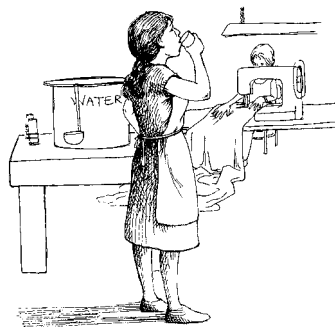
- Extreme thirst.
- Weakness.
- Headache.
- Nausea or abdominal cramps.
- The skin is usually sweaty and may be cool and pale.
- There may be a prickly feeling on the skin or a rash.



#### TREATMENT

- Rest in a cool place. Take off extra clothes.
- Give rehydration drink—mix ½ teaspoon salt in 1 liter water (see page 22 of *Belly Pain, Diarrhea, and Worms*).
- Give plenty of other cool liquids too.
- Gently stretch out cramps, move feet, or slowly walk.

If not treated, heat exhaustion can worsen into heat stroke.

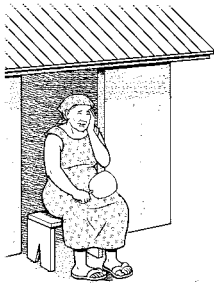


## Heat stroke

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 22 of *Belly Pain, Diarrhea, and Worms*). 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 cool drinks often. But drink beer or other alcohol only in moderation while working or playing in the heat. 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. See the chapter on Cancer (in development).

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**

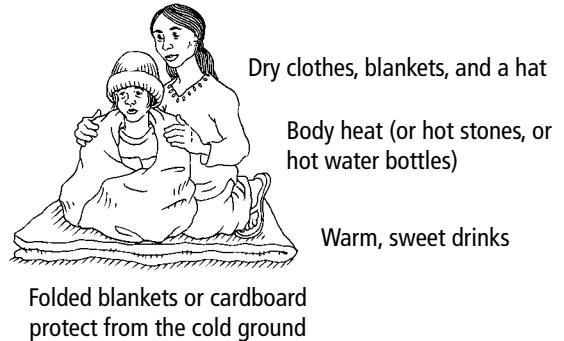
- Shivering
- Fast breathing and heart rate
- Difficulty speaking clearly, clumsiness
- Confusion
- Having to urinate more

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 6). 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 (pages 81 to 84). Do not let it become frozen again.

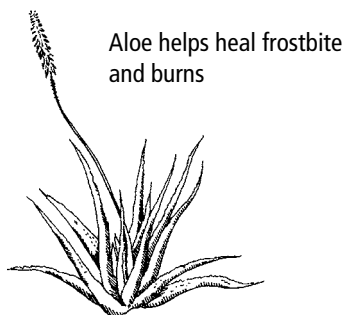


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*It is better to let the area stay frozen  
than to thaw it and let it freeze again.*

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As frostbite heals over the coming days and weeks, treat it as you would a burn (see page 37).



Aloe helps heal frostbite  
and burns

# 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. Penicillins fight many infections, including those that produce pus.

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 75) 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 77).

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: broad-spectrum antibiotics

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.

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 66) can be used instead. 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 ampicillin and amoxicillin 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. Ampicillin can also be given by injection for severe illnesses.

As with other antibiotics, there is a range for how long to continue giving these medicines. Continue the medicine until all signs of infection (including fever) have been gone for at least 1 to 2 days (24 to 48 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 of the range 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.

For severe infection, double the dose above.

**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.

For severe infection, double the dose above.

## Amoxicillin with clavulanic acid (Amoxicillin-clavulanate potassium)

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Amoxicillin with clavulanic acid comes in different strengths of each of the 2 medicines it contains. So it may say 250/125 (meaning 250 mg amoxicillin and 125 mg clavulanic acid) or 500/125, or 875/125. The dose is often described only in terms of the amount of amoxicillin as we do below.

Give by mouth with food or milk.

**How to use** 

### For animal bites

➔ Give 25 to 45 mg per kg each day, divided into 2 doses. If you cannot weigh the person, dose by age:

**Under 3 months:** give 75 mg, twice a day for 3 to 5 days.

**3 months to 1 year:** give 100 mg, twice a day for 3 to 5 days.

**1 to 5 years:** give 125 mg, twice a day for 3 to 5 days.

**6 to 12 years:** give 300 mg, twice a day for 3 to 5 days.

**Over 12 years:** give 600 mg, twice a day for 3 to 5 days.

## Penicillin by mouth, penicillin V, penicillin VK

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Penicillin by mouth (rather than by injection) can be used for mild and moderately severe 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 3 doses, for 10 days. If you cannot weigh the person, dose by age:

**Under 1 year:** give 80 mg, 3 times a day.

**1 to 5 years:** give 175 mg, 3 times a day.

**6 to 12 years:** give 175 to 325 mg, 3 times a day.

**Over 12 years:** give 325 to 650 mg, 3 times a day.

For more serious infections, double the doses above.

**For a wound likely to be infected with tetanus,** after giving penicillin G (page 64) for 2 days, 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 69) OR clindamycin (page 68).

## Injectable penicillin, penicillin G

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Injectable penicillin should be used for certain severe infections, including tetanus.

Injectable penicillin comes in different forms. The main difference is how long the medicine lasts in the body: 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.

**For a wound likely to be infected with tetanus,** 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) (see page 63). Also give antitetanus immunoglobulin (page 73).

## Cloxacillin

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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 65) can be used instead.

### Side effects

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

### Important

- Do not give if the person is allergic to penicillin.
- This medicine may make birth control pills less effective. If possible use another method (such as condoms) while taking this medicine.

### 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 69).

**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 69).

## Dicloxacillin

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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 64) can be used instead.

### Side effects

Nausea, stomach pain, loss of appetite.

### Important

- Do not give dicloxacillin to someone who is allergic to penicillin. Do not give to newborns.
- This medicine may make birth control pills less effective. If possible use another method (such as condoms) while taking this medicine.
- Stop taking if you begin to have dark urine, clay 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. For children over 40 kg, give 125 to 250 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 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 has a fever, give the dose above for 10 to 14 days.

## Other antibiotics

### Erythromycin

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Erythromycin works against many of the same infections as penicillin but can be used by those who are allergic to penicillins. For many infections, it can also be used in place of tetracycline.

#### 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:** 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.

Give for 7 to 10 days, or until 1 to 2 days (24 to 48 hours) after all signs of infection are gone.

For severe infections, double the doses above.

### Tetracycline and Doxycycline

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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 is a lot of resistance 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.
- Do not use tetracycline or doxycycline that is "old" or past its expiration date.

- 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.
- This medicine may make birth control pills less effective. If possible use another method (such as condoms) while taking this medicine

### 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 tetracycline. 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 69) or clindamycin (page 68).

## Cotrimoxazole, sulfamethoxazole with trimethoprim, TMP-SMX

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This combination of 2 antibiotics is inexpensive and fights a broad-spectrum of infections. It is an important medicine for people with HIV and can prevent the many infections that occur as a result of HIV infection.

### 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 the person develops a rash 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. Dose is sometimes described only in terms of the amount of trimethoprim (the second number).

### For most infections

- **6 months to 1 year:** give sulfamethoxazole 200 mg + trimethoprim 40 mg, 2 times a day.
- 2 to 4 years:** give sulfamethoxazole 300 mg + trimethoprim 60 mg, 2 times a day.
- 5 to 9 years:** give sulfamethoxazole 400 mg + trimethoprim 80 mg, 2 times a day.
- Over 9 years:** give sulfamethoxazole 800 mg + trimethoprim 160 mg, 2 times a day.

**For animal bites,** give the amount above for 3 to 5 days. Also give metronidazole (page 69) or clindamycin (page 68).

## Clindamycin

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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 66), cotrimoxazole (page 68) OR penicillin V (page 63).

**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 70).

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

## Metronidazole

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Metronidazole is inexpensive and is often helpful by itself or in combination with other antibiotics when you do not know the exact cause of a severe infection and are trying to treat as many different bacteria as possible.

## 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 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 65) OR cephalexin (page 71).

**For a wound likely to be infected with tetanus**, give the dose above for 7 to 10 days. Also give antitetanus immunoglobulin (see page 73).

**For animal bites**, give the dose above for 3 to 5 days. Also give another medicine such as doxycycline (page 66), cotrimoxazole (page 68), OR penicillin V (page 63).

**For a bone that has broken through the skin (open fracture)**, give the dose above for 5 to 7 days. Also give ceftriaxone (page 71), cephalexin (page 71) OR cloxacillin (page 64).

## Ciprofloxacin

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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). 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 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 68).

**For a bone that has broken through the skin (open fracture)**, give the dose above for 5 to 7 days. Also give clindamycin (page 68).

**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 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 (page 85) 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.

➔ Give 50 to 100 mg per kg each day, divided into 2 doses a day. If you cannot weigh the person, dose by age:

**Under 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 69).

**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 69).

## 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 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 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 69).

**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 69).

## Gentamicin

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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

## Antitetanus immunoglobulin (human)

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If a person is not up to date with their tetanus vaccination (all 3 injections, and boosters every 10 years), then they should be given antitetanus immunoglobulin as soon as possible after a wound that might cause tetanus (see page 20). Give antitetanus immunoglobulin before signs of tetanus begin. If the person is getting both the tetanus vaccine (see Vaccines – in development) and the antitetanus immunoglobulin at the same time, use separate needles and inject in different places on the body.

Do not give live virus vaccines for 3 months after someone has received antitetanus immunoglobulin because it may make the vaccines less effective.

### 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 (see page 77).

### How to use



When injecting, put the needle deep in the muscle.

#### **For a wound less than 24 hours old**

→ Inject 250 units one time.

#### **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.

Also give an antibiotic such as metronidazole (page 69) OR penicillin G (page 64).

## 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 63) is the best choice for treating animal bites.

If you do not have amoxicillin with clavulanic acid, give one of these:

DOXYCYCLINE (pages 66) **OR**

COTRIMOXAZOLE (page 68) **OR**

PENICILLIN V (page 63)

**AND** one of these:

METRONIDAZOLE (page 69) **OR**

CLINDAMYCIN (page 68)

If the bite was from a dog, also give a rabies vaccine and rabies immunoglobulin (see below).

## 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, but it is more expensive and may not be available where you live.

### Side effects

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

### Important

Rabies immunoglobulin can cause a severe allergic reaction for some people. Always have epinephrine (adrenaline) available in case of an allergic reaction (see page 77).

### How to use

Inject rabies immunoglobulin in and around the cleaned wound. If the entire amount cannot be given around the wound, inject the rest into the side of the thigh muscle.

If you do not have enough vaccine to inject around several wounds, add saline to double the amount. This way all wounds receive some vaccine.

#### Using Human Rabies Immune Globulin (HRIG)

→ Inject 20 units per kg one time.

#### Using Equine Rabies Immune Globulin (ERIG)

→ Inject 40 units per kg one time.

Also give rabies vaccine (see Vaccines – in development), but use a separate needle and inject in a different place on the body. Inject 1 ml into the thigh muscle on the day of the bite, and then again on days 3, 7, 14 (2 weeks) and 28 (4 weeks) after the bite.

# Medicines for Burns

Burns can be very painful. Give strong pain medicines such as codeine (page 83) OR morphine (page 84), 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 65), clindamycin (page 68), cephalexin (page 71), OR ciprofloxacin (page 70) if there are any signs of infection.

As the burn heals, give an antihistamine like chlorpheniramine (below) OR diphenhydramine (page 76) to calm the itching.

Give a tetanus vaccine if the person's tetanus vaccination is not up to date (see Vaccines—in development).

If the person was in a fire and inhaled a lot of smoke, salbutamol can help them to breathe more easily (see page 77).

# 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 (see page 77).

## 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 food or drug allergy, 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 77). 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 77). 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 6 years:** inject ¼ mg (.25 mg).

**7 to 12 years:** inject ⅓ mg (.33 mg).

**Over 12 years:** inject ½ mg (.5 mg).

If needed, you can give a second dose in half an hour, and a third dose in half an hour after that. Do not give more than 3 doses.

After giving epinephrine, give an antihistamine such as chlorpheniramine (page 75) or diphenhydramine (page 76). 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

Give aspirin (see page 83) right away to someone who has had a heart attack. On the way to a hospital, give nitroglycerine if you have it.

You can also give morphine (page 84) to help with the pain and fear, and make it easier for the heart to pump.

## Nitroglycerine (Glyceryl trinitrate)

---

Nitroglycerine 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 nitroglycerine to someone with low blood pressure or who has taken sildenafil (*Viagra*) in the last 24 hours. The combination of these 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

→ Give ½ mg (0.5 mg) dissolved under the tongue, every 5 minutes. But do not give more than 3 times in 15 minutes.

# 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, so give it if you think the person may have been poisoned, 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 .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:
  - Under 5 years:** slowly inject 550 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: 2000 mg (2 times), then 1000 mg (2 times).

## Acetylcysteine

---

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

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

### How to use

#### For acetaminophen (paracetamol) overdose

- ➔ Give 140 mg per kg by mouth. Wait 4 hours then give 70 mg per kg by mouth, and continue giving this amount every 4 hours, for 17 times. 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, methadone, opium, oxycodone, 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:** inject 0.1 mg per kg into the muscle every 2 to 3 minutes as needed, but do not give more than 2 mg all together.
- Over 5 years:** 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 next page 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 with blood). So, for example, if you twist your ankle, they will not only relieve the pain, but will also reduce the swelling. This helps you heal faster. But people with fevers and viral infections should avoid aspirin.

Do not give more than the recommended dose of these medicines. All of these drugs can have bad effects if too much is taken. For example, overuse of aspirin and ibuprofen can cause ulcers. Too much paracetamol is poisonous. For severe fever or pain, you can avoid using too much by alternating paracetamol and ibuprofen.

## 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 ¼ of a 500 mg tablet), every 4 to 6 hours.

**1 to 2 years:** give 125 mg (¼ of a 500 mg tablet), every 4 to 6 hours.

**3 to 7 years:** give 250 mg (½ of a 500 mg tablet), every 4 to 6 hours.

**8 to 12 years:** give 375 mg (¾ 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 aspirin. 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. If you cannot weigh the person, dose by age.

**6 months to 1 year:** 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 ½ 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 or morphine hydrochloride)

---

Morphine is medicine for pain in the opiate family. It is 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.
- Do not use morphine if you are breastfeeding. It can pass through breast milk and harm the baby.
- Do not use morphine if you have ever had an allergic reaction to codeine.

### 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 solution of 2% 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 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 two doses and do not give more than 30 mg in one day.**
- Diazepam is a habit-forming (addictive) drug. Avoid long-term or frequent use.
- Do not take during pregnancy or while breastfeeding unless there is severe pre-eclampsia or seizures.
- Do not inject diazepam 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 anus (see page 86).

## How to use

### To relax muscles and calm a person

Give diazepam tablets by mouth 45 minutes before a painful procedure like setting a bone.

- ➔ Give 0.2 to 0.3 mg per kg. If you cannot weigh the person, dose by age:
  - Under 5 years:** give 1 mg.
  - Over 5 years:** give 2 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 anus. Or use diazepam gel made for use in the anus.
  - 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

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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 take during pregnancy unless there is severe pre-eclampsia or seizures.
- 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 anus (see 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.