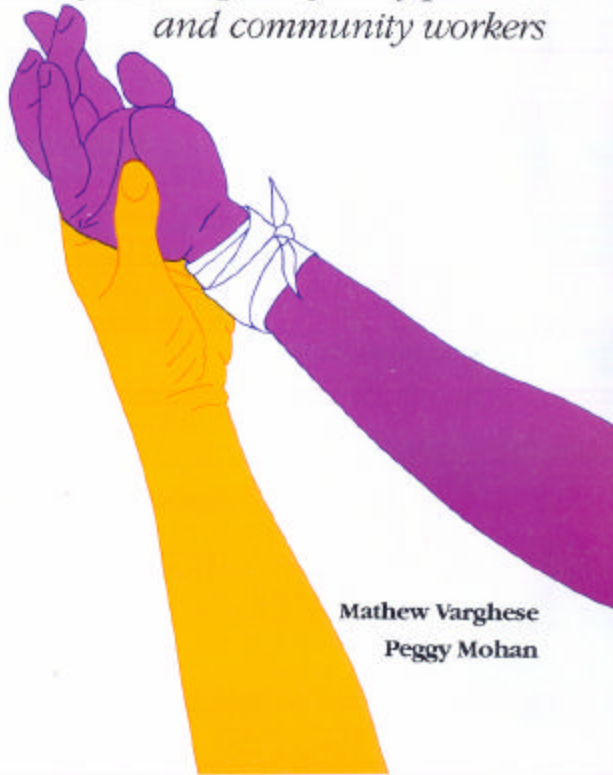


# When someone is hurt...

*a first aid guide for lay persons  
and community workers*



Mathew Varghese  
Peggy Mohan

# **When someone is hurt . . .**

*a first aid guide for lay persons  
and community workers*

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## About this book . . .

This book anticipates that average people interested in giving first aid might know little or nothing about the human body from a medical point of view.

But this is not a problem. You don't have to understand anatomy, or medical terms and techniques, in order to give first aid. In fact, we felt we would only intimidate most of you if we gave you a lot of technical details, and this might turn you off the idea of first aid as something too technical and far beyond you.

What we have done in this book instead is leave out technical terms, and details about anatomy, and concentrate on showing the processes involved, from the layman's point of view. The idea is for you to become confident about simple, practical measures that would help the patient without causing more damage.

First aid is meant to make the the injured as comfortable as possible and to protect them from further injury before they reach the hospital.

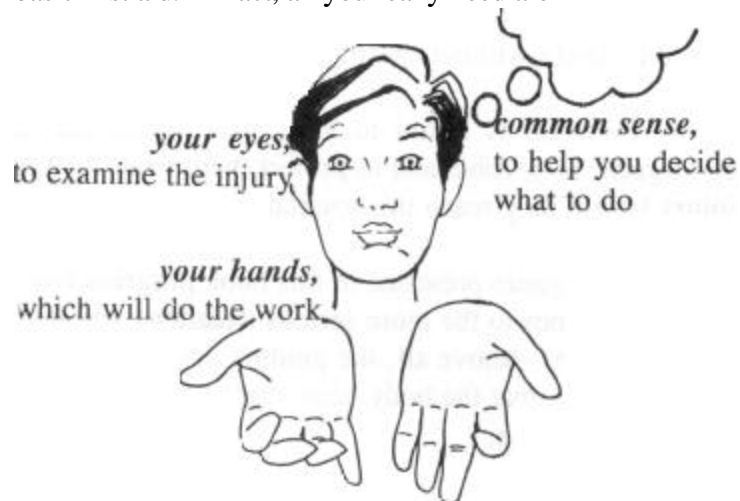
The injuries presented in this book progress from the simpler ones to the more serious situations you may be faced with. Above all, the guiding principle of this book has been that the body heals itself. We only need to give it a chance.

## Why has this book been written?

This book is meant to help you know what to do when someone near you is hurt.

Instead of panicking, you can do a lot to help. This book will give you the basic information you will need to act confidently and correctly to help people who are injured.

You do not need special equipment or training to do basic first aid. In fact, all you really need are





You might also need *a helpful bystander*, to call for help, and to help carry the patient.

The everyday materials around you, like clean cloth, clean water, or rolled newspaper are good enough to help a patient before you get to the hospital. Often they are as good as the things you would find in a hospital.

## **Injury is another "disease"**

Is getting hurt any different from other illnesses?

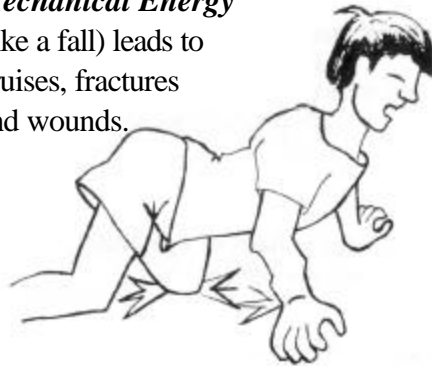
No. The only difference is that illnesses are caused by germs, and injuries are caused by *energy*. The point is that an injury is not simply the result of "carelessness", or something the patient "deserved". When we look at injury as just another disease to be treated, this allows us to get away from assigning blame, and to get on with the real task of *treatment*.



Any form of energy can cause injury.

***Mechanical Energy***

(like a fall) leads to  
bruises, fractures  
and wounds.



***Chemical Energy***

(like acid)  
causes burns

***Heat Energy***

(like fire) causes burns

As with illnesses, many injuries can be prevented. Helmets can prevent head injuries. Railings on staircases prevent children from falling. Sandy playground surfaces keep children from getting hurt when they fall. However, not all injuries can be prevented.

## What are wounds?

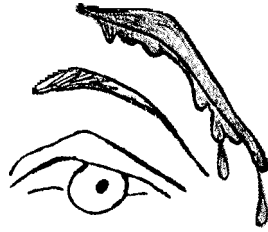
When skin is bruised or cut, the blood vessels underneath also get torn. This causes bleeding. A break in the skin is called a wound.

If the wound is deep or large there will be more bleeding. If a large blood vessel is cut there may be profuse bleeding, which may come in spurts. This could happen in crush injuries, stab wounds or amputations.

Normally our skin protects us from the outside environment. But wounds allow germs to enter the body. This leads to infection and pus formation. If the infection is serious, the patient may die or lose a limb because of poisons released by the germs. A wound could have



*Ragged edges,*



*Clean cut edges,*



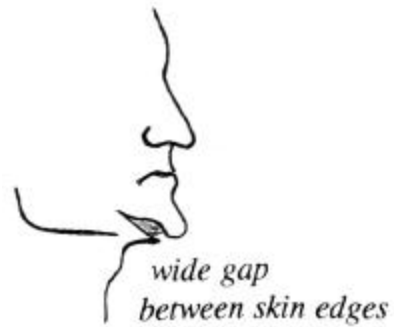
*Or skin peeled away,*

Wounds with clean edges heal faster than wounds with ragged edges. If the skin is peeled away completely it may take a long time before it heals.

## Helping the body heal itself

Whatever be the cause of the wound, healing is a process which the body does naturally.

There is no way to make the body heal wounds faster. But there are several factors which could delay healing.



*When the wound  
Is very deep*



The job of the first aider, in fact the job of any medical professional, is to remove or reduce these problems so that the body can heal itself efficiently.

All wounds need to be rested for healing to take place, just as a newly planted sapling needs to be left undisturbed.

The most important thing you can do is keep the wound clean. The easiest way to keep small wounds clean is to wash them with running water.

Some people may worry about using *ordinary unboiled water* on wounds, because unboiled water contains germs. This is true, but the germs in unboiled water are usually not disease-causing germs. In fact, before the most sophisticated surgery, surgeons wash their hands with ordinary unboiled water and soap, even when they are not going to use gloves.

*Water is the best medicine for small wounds*



*Water is the best medicine for small wounds*

Antiseptics and antibiotics are not required if the wound is clean.

***Do not apply any fats, oils, ointments or any other pastes on the wound:*** these only delay healing and make it difficult for the doctor or nurse to properly examine the wound later.

Sometimes splinters, thorns and pieces of glass that caused the wound may still be inside the wound. If you do not remove these they could cause serious infection, and the wound will not heal. These are easy to remove with a pair of tweezers.

## Some wounds are deceptive

**Stab wounds:** Some stab wounds may look very small and harmless, but stab wounds can be dangerous. The knife may have penetrated deep, cutting important nerves, blood vessels or vital organs.



Sometimes the blade of the knife may still be stuck in the wound. In such situations it is safer to leave the knife there

and take the patient to a hospital.

Any stab wound to the chest, abdomen or neck should be seen by a surgeon, because there could be serious injuries to vital organs inside.

**Firearm injuries:** Firearm injuries may also have a small entry wound, but because of the high velocity, or speed, with which bullets enter the body, they cause serious damage inside. The greater the energy causing an injury, the more serious the damage it causes.

Firearm wounds should always be shown to a surgeon.

**Bites:** Bites, whether by animals or humans, can be dangerous.

This is because the mouth is full of organisms that cause infection. All bites should be thoroughly washed with soap and water. What this does is wash off as many germs as possible.

A bite from a dog, cat, wolf, fox or monkey could cause rabies. Unless you know for sure that the animal causing the bite has been vaccinated against rabies, inoculation must start *at once*, because rabies always results in death. Inoculation means the patient will need a series of anti-rabies injections, which will have to continue over a period of a few weeks.

Bites should also not be covered up and stitched, as that can lead to a festering infection.





## Bleeding

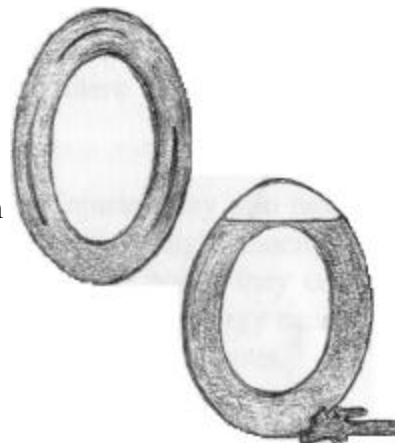
The bright red colour of blood always attracts attention. So external bleeding is always noticeable, though internal bleeding may not be, as the blood does not actually come out of the body.

Bleeding occurs whenever there is a wound. The amount of bleeding from a wound depends on the location, size and depth of the wound.

Even small wounds of the face and scalp bleed much more than other parts of the body as they are richly supplied by blood.

### The closed loop

In our body blood is pumped all the time in a closed system of blood vessels. When bleeding occurs this closed system becomes an open system.



In other words, the same blood circulates from the heart throughout the body and back to the heart. When any bleeding occurs there is a break in the closed system as blood leaks out. Unless bleeding is controlled naturally, or by other means, the patient will lose more and more blood.

At first the body compensates for the loss of fluid by increasing the heart rate. Then it moves fluids or blood away from other less important parts of the body, like the skin and the stomach, to more important parts like the brain. The patient's skin becomes cool and clammy because blood is mobilised away from the skin. Blood pressure drops and reaches a stage where you cannot feel the pulse. Medically the patient is now said to be in a state of *shock*. If shock continues beyond a certain period of time, the patient will die.

In a child, a small amount of bleeding might be even more serious than a large amount of bleeding in an adult. Children can go into shock faster than adults. ***It is important not to see children just as smaller adults.***

Under normal circumstances the body's protective mechanisms come into play to stop bleeding. These are clotting of blood and narrowing of blood vessels, along with several other processes.

However, it takes a little time for bleeding to stop naturally. If the wound is large or deep it may take longer.

As a first-aider you can help stop the bleeding while the body is also doing its best.



The easiest way to stop bleeding is to **apply direct pressure on the wound**. This can be done with any clean folded cloth like a clean handkerchief, or any cloth torn from clean clothes.

Since you will have to keep up the pressure for at least ten minutes, it is less tiring to **lean** on the wound with the heel of the hand than to try to squeeze it with your fingers.

If there is a fracture, direct pressure may cause more pain. You will have to use a splint, combined with a gentle pressure bandage.

Often injured patients who are bleeding, complain of thirst. This is the body's way of warning that the blood loss is significant enough to stimulate the thirst centre in the brain.

Though you may feel good giving water to someone who is seriously hurt, **it is safer not to give the patient anything to eat or drink**. This is to protect the patient from vomiting in case he needs anaesthesia and surgery, or has a head injury.

It is not safe to get someone else's blood on you, as blood could contain other infections which might be passed on. Use any barrier between your hand and the patient's body. Even a piece of polythene or a large leaf will do.



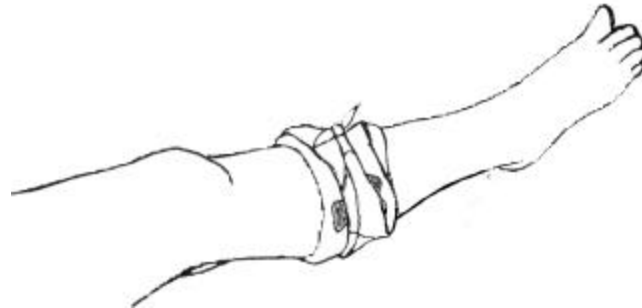
If the wound is on the arm or the leg, the limb can be raised. This reduces the blood flow to the wounded area, as the blood would have to move against the force of gravity.

If movement of the limb or local pressure causes severe pain this could be a sign of a fracture, or of a dislocation. Do not elevate a limb that has an obvious fracture or a dislocation.

When you apply pressure on a wound to reduce bleeding, you should ***keep up the pressure continuously for about 10 minutes*** for bleeding to stop. If you stop pressing and the wound still bleeds, then keep pressing.

If after a while bleeding is still too much and blood soaks through the cloth, get a fresh piece of cloth and throw away the used cloth. A cloth soaked with blood would be too spongy to pass on proper pressure to the wound.

You can tie the cloth pad firmly in place with a bandage made from any piece of cloth. This becomes what is known as a ***pressure bandage***. A pressure bandage is always tied ***over the wound itself***, to reduce bleeding.



Since too tight a bandage would hurt the patient very badly exactly where he has a wound, a pressure bandage is unlikely to be so tight as to cut off the blood supply lower down the limb. If the bandage is too tight the patient will start feeling "pins and needles" as the fingers and toes become numb, or the fingers and toes will turn blue.

If the patient is unconscious, you will have to use your own judgement about how tight to tie the pressure bandage.

Do not ever tie the tight bandage known as a "tourniquet". A tourniquet is different from a pressure bandage in that it is tied higher on the limb, and not on the actual wound. Its purpose is to reduce bleeding by compressing the major blood vessels that feed the limb. Since it is not tied onto the wound, there is less pain to limit how tightly it can be tied. Some patients have ended up losing limbs, because tourniquets have cut off the blood supply to their limbs for too long.

## **Can you bleed without blood coming out?**

In blunt injuries to the chest, abdomen and head there may be internal bleeding. So, though no blood comes out, the blood collects inside the body and the patients may still bleed to death. If the injury has been severe enough to bruise the skin on the chest or abdomen, and if the patient feels pain inside the abdomen, get medical help even if the patient looks normal otherwise.



As a first-aider all you can do to stop internal bleeding is to help get the patient quickly and safely to hospital.

## When the chest or abdomen are injured

Open injuries of the chest and abdomen are serious.

In abdominal wounds the intestines may come out. The only thing you can do as a first-aider is cover the wound with a very *wet* clean cloth and get the patient

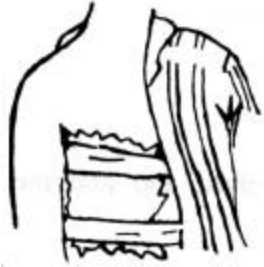


quickly to a hospital. The wet cloth will keep the intestine from drying out, and will not stick to the intestines.

Open wounds of the chest could be sucking in air, making it hard for the patient to breathe. The ribs may also be fractured, so applying pressure may produce further damage.







Covering the wound with a piece of polythene, and putting a bandage on top of this may help to reduce air being sucked into the chest.

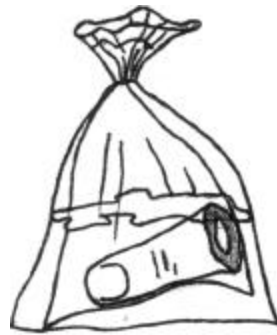
It is better not to try to do too much at the site of the accident. Get the patient quickly to a hospital.



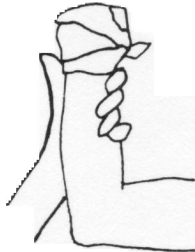
## And if part of a limb is cut off...

If a part of the limb has been cut off, it may be possible to reattach it to the body. You should carry the cut off part also to the hospital.

Put it inside a clean polythene bag and place this bag in another bag with cold water. If you can easily get ice put some in the water to keep it cold. Make sure that the limb does not get soaked in the water.



If nothing else is available, carry the amputated part in a clean cloth quickly to the hospital.



In large crush injuries or in amputations you should not try to wash or clean the wound.

Washing a large crush injury only means that more blood will be lost. When the wound is large the damaged blood vessels are also much larger, so bleeding is harder to stop. In any case, some of the dirt is washed off by the bleeding itself. Just cover the wound with a clean cloth and tie a pressure bandage quickly. If possible, keep the limb raised.

Never use raw cotton wool (as opposed to cotton cloth) to cover a wound, as raw cotton fibers stick to the wound, and they are difficult to remove and delay healing.

The earlier a large wound is treated, the lesser the chances of infection.

## Wounds of the eye

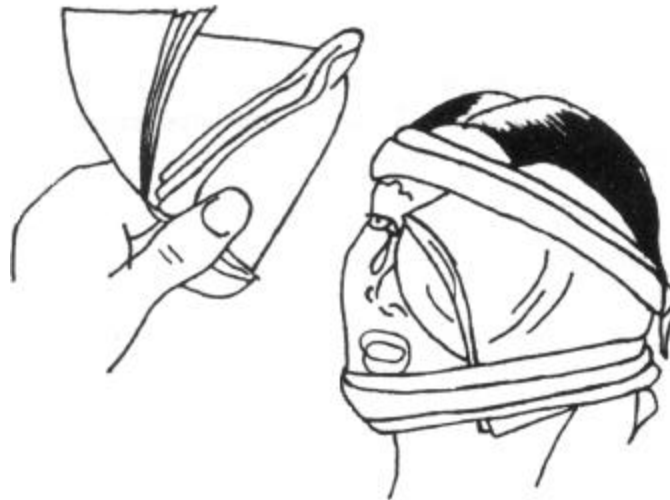
Any injury to the eye can lead to blindness. ***Do not*** attempt to do any cleaning or washing of an open eye injury.

However, chemicals like acids and alkalis that irritate the eye should be washed out with running water. You may need to do this for even up to half-an-hour.

Cover the eye with a clean soft cloth, place a stiff covering on top to ***prevent*** any pressure coming on the eye.

This is important, because the contents of the eye can be squeezed out even through a very small wound.

You can use a paper cup or make one out of stiff paper.



## Bleeding from the ears

This could mean either injury to the ear alone, or, a serious head injury (see page 32,33)



Do not put anything in the ears to stop bleeding. Packing anything inside the ear to stop bleeding could further damage the ear drum.

Also, any antiseptic put into the ear could go through a torn ear drum and do damage to structures

deeper inside the ear.

Get the patient to lie down with the injured ear facing down.

You should treat all patients bleeding from their ears as head injured

## Bleeding from the nose

Bleeding from the nose could be caused by an injury, like a punch on the nose. It could also mean a head injury.

If the patient is conscious and can sit up, ask him to pinch his nose and breathe through his mouth. He should keep up the pressure for at least 10 minutes, or even up to 20 minutes.



If he can lean forward, then that could prevent blood from going to his wind pipe and choking him.

If the patient is unconscious, treat him as a head-injured patient. The patient should lie with the face to one side, for the blood to come out easily, so that there is no choking.

## Injuries to muscles, bones and joints

If you fall, or are hit by a blunt object, you could get hurt in your muscles, joints or bones. Blood collects in the injured area, and a swelling appears soon. Like any open wound, these injuries are very painful, especially when the limb is moved.

You can reduce the swelling by bringing down the bleeding.



Apply cold water, or ice packs if available. Cold water is the best medicine for sprains and blunt injuries to limbs.

Cold water reduces the local blood flow, and this brings down the internal bleeding and swelling.

Do not keep ice packs on for more than ten minutes at a stretch, as this will lead to something like frostbite. If the skin becomes red after the ice packs have been removed for

a few minutes, it is an early warning to stop using the ice packs.

***Do not place ice directly on skin.***

***Always wrap it in a cloth first.***

When ice is wrapped in a cloth it becomes less cold. The body feels anything down to about 4° Celsius as cold. Anything from 0° to 4° Celsius is painful.

Anything below freezing leaves you numb, and this is dangerous. Numbness is a sign that tissue is dying.



It is easier to apply ***crushed ice*** rather than a block of ice because crushed ice takes the shape of the body better.

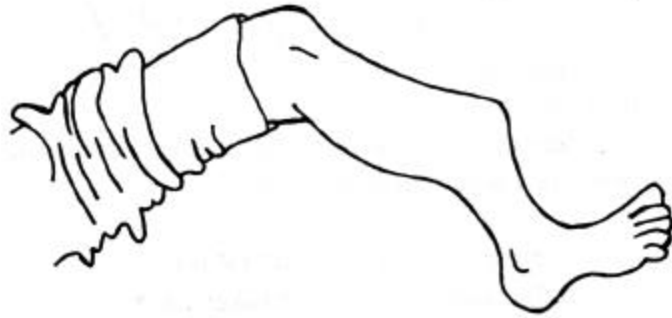


Another way to make a muscle injury less painful is to put a ***splint*** on the injured limb.



## Broken bones and dislocated joints

A *crack, break* or *fracture* all mean the same thing: a break in the continuity of the bone.



A *dislocation* is a shift between bones at a joint.

There is no foolproof way of knowing if there is a fracture or a dislocation. You should always suspect a fracture or dislocation if there is

*obvious deformity*  
*abnormal mobility*  
*if the limb cannot be moved at all*  
*a grating feeling when you move the limb*  
*if you think there may be a fracture, but are*  
*not sure*

Do not try to forcibly check for a fracture or a dislocation. This could lead to serious damage.

Any fracture or dislocation is very painful. The pain is much more when the injured part is moved. First-aid for all fractures and dislocations must aim to reduce movement.

Reducing movement gives relief from pain. If you can think of any way to keep the injured part from moving, the patient will be more comfortable. Splinting reduces movement, and also prevents further injury. Even a plaster applied in the hospital relieves the pain because it reduces movement. The only difference is that the surgeon lines up the broken bone before putting the plaster. Bones, too, grow back together naturally. All that the surgeon does is make sure that they join together in the right shape.

Anything that is stiff can be used as a splint. Sometimes even soft things like pillows and blankets can also be used as splints. However, any splinting should be done with caution, because manipulating the limb to splint it could damage muscles, nerves and blood vessels.

When you use a hard splint like bamboo or wood, always use something soft between the skin and the splint. This could be any folded cloth. A hard splint directly against the skin could begin to hurt after some time.

In an unconscious patient try to leave the injured limb as it is when you splint it.

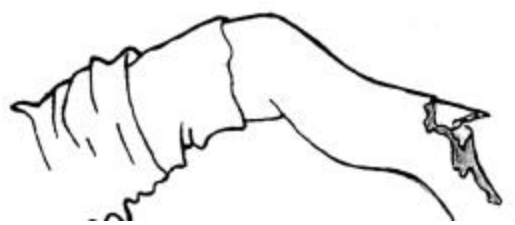
If the patient is conscious it is easier, because any abnormal movement will cause pain, and the patient can guide you to splint the limb safely and avoid further damage. Here are some ways of splinting limbs:



Do not use air splints, even if they are available. Air splints have been known to cause serious injuries to nerves, muscles and blood vessels.

## Open fractures

A fracture or dislocation could also be an open injury, that is, an injury where the skin is broken.



An open fracture may bleed profusely. To reduce this bleeding, cover it with a clean cloth and splint the limb to reduce movement.

Open injuries of bones and joints are very serious, and must always be treated in a hospital. This is because infection may enter the body through the break in the skin, and infections in bones and joints are difficult to get rid of. They can also leave a patient crippled for life.

## Being hit on the head

Our brain is "helmetted" in a hard shell of bone called the skull, which protects it from all sorts of injuries.

If the blow to your head is too hard, you can get a brain injury with or without skull fracture. You could have a temporary loss of memory, or a brief spell of unconsciousness. At the other extreme, you could even suffer permanent loss of memory, paralysis or death.



In a blow to the head, a person may just black out for a moment, or "see stars".

A head injury may be severe enough to directly bruise the brain, very much like getting a bruise on the skin.

In a severe blow, blood vessels inside the head may get ruptured. This causes bleeding, and the blood gradually collects. This blood presses against the brain, and this causes paralysis, and loss of consciousness.

A head-injured person may, therefore, look normal and talk normally right after injury, but after a while may show all the signs of head injury.

You should still suspect head injury if the patient

*has "seen stars" or blacked out*  
*has a deep head wound*  
*has an obvious skull fracture*  
*has a severe headache*  
*has vomiting after injury*  
*bleeds from the ear or nose*  
*looks confused*  
*has fits*  
*is gradually losing consciousness*  
*is unconscious*

The vomiting may either be from severe pain, or because the brain is getting compressed inside the skull. A patient with any of these symptoms needs to be taken to a hospital as quickly as possible.



## If a child has a fall...

If a child falls from even a table, it could result in a serious head injury. If a child has fallen and hit his head, even if the fall is only from *one metre* in height, there could be a head injury.



Watch a child even more carefully than you would watch an adult for signs of head injury.

## How do people get paralysed from injuries?

Paralysis occurs when there is damage to the nerves, or to the cells controlling these nerves in the brain or spinal cord. This could happen in head injuries, or in injuries to the neck and back.

The most important nerves that connect our body to our brain pass through the backbone. These nerves together form the spinal cord.

The spinal cord can get damaged in fractures or dislocation of the neck or backbone.

This could happen in a fall from a tree or a roof, or even from diving into shallow water.







It could also be damaged by  
a stab or  
a gunshot.

Injuries to the brain  
and the spinal cord cannot  
ever be repaired. Once these  
are damaged, the paralysis is  
permanent. That is why prevention of these injuries is so  
important.

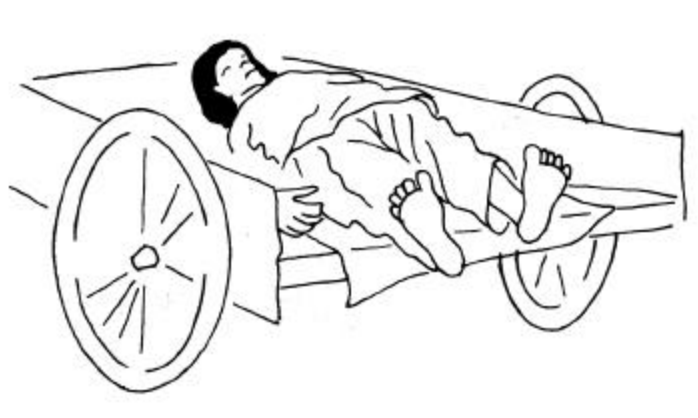
Sometimes when the neck or back is broken, the  
spinal cord is not damaged, or, is only partly damaged. These  
patients may get paralysed if they are shifted or carried  
carelessly, as movement may damage the spinal cord. So it is  
extremely important to move these patients very carefully.

Always be alert to the possibility of spinal cord injury,  
especially if a person

*is unconscious,  
is complaining of pain in the neck or back,  
cannot move his arms or legs,  
has had a fall from a height, or  
has been thrown from a vehicle*

Whatever the cause, a "second accident" that causes paralysis has to be avoided.

These patients have to be transported quickly to a hospital taking care not to cause any further damage.



## How do you shift patients safely?

If the patient is conscious and breathing, he may be able to guide you himself. Simply avoid any movement which causes the patient pain or discomfort

The head, neck and trunk of the injured person must be moved together as a block, as though they were a single log of wood. The neck and back must not be twisted or bent.

You will not be able to carry an injured person correctly alone, so always get help. You may need three or four people to help you.



## Is the patient conscious?

If the patient has a broken jaw, for example, he may not be able to respond in words. So a response could also be moving a limb or finger, or even an eyelid when asked to. When an injured person does not respond to your calls, you should assume that he is unconscious.



A person may become unconscious as a result of a head injury or because of any injury with severe bleeding. A person may also be unconscious because his breathing is blocked.

If the patient is unconscious, it means the injury is severe.



The patient may even be dying. He may be gasping for breath, or may not be breathing at all. Put your hand in front of the patient's nose and feel if any air is coming out.

You could even put your ear close to his nose and listen for signs of breathing.



***If you get no sign of breathing for five seconds, assume that the patient is not breathing.***

The patient may not be breathing because his tongue may have fallen backwards into the throat and blocked the airway. Or, there may be blood, or vomitus, or broken teeth, or anything else choking his throat.



Pulling the jaw forward helps prevent the tongue from blocking the throat. This is because the tongue is rooted in the jaw. So this is the first thing to do if the patient is not breathing.

To remove anything blocking the airway, turn the patient's head gently to one side, cover two of your fingers with a cloth, like a handkerchief, and quickly clear out the patient's mouth.



If you have reasons to suspect that the patient may have a neck injury, turn the head, neck and chest of the patient ***together***.

If the patient is still not breathing, proceed to give mouth-to-mouth respiration. This procedure is explained from page 38 to 41. Mouth-to-mouth resuscitation is a skill which needs training and frequent practice. You cannot master it from a book alone.

## Dealing with burns

When our cells are exposed to heat, they "cook" just as the white of an egg sets when it gets cooked. This kills the cells. Water does not have to be boiling hot for this to happen. Something very warm on your skin for a long time has the same effect as something very hot for a much shorter time.



Whenever our skin is burned, the nerves are irritated, and this causes pain. At first our skin becomes red, because the heat dilates the skin's blood vessels. This is called a "first degree burn".

As the temperature of our skin goes up, blisters form, and it hurts. This is called a "second degree burn".



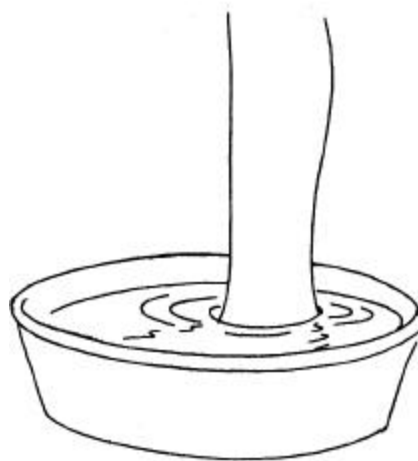
In worse burns, even the nerves get burned, and the skin gets charred and leathery. This does not hurt, because the nerves have been destroyed. This is called a "third degree burn". The surrounding area in a third degree burn may, however, be very painful.

If a burn hurts and the skin is red, or blisters form, it is a sign that the burn is *not* so severe.

Once a part of our body gets heated, it takes time to cool down. So even if the heat source is removed, our cells continue to get killed, until the temperature comes down.

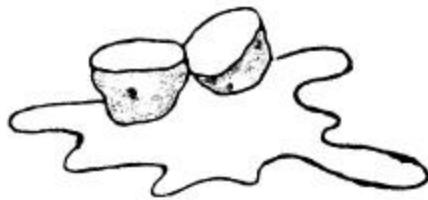
The best way to bring down the temperature of burns is *cold water*. A burn should be kept in cold water for at least ten minutes, so that the burnt area cools down completely.

The patient can guide you in this, as he may *like* to keep the burned area in cold water, as this greatly reduces the pain.





If you leave hot potatoes to cool by themselves, they take a long time.



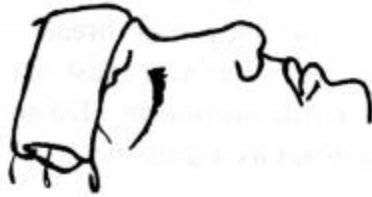
If you dip them in cold water, the outside will cool, but the inside will remain hot. So if you want them to cool down completely, you have to *leave them in cold water for at least ten minutes.*

Similarly, even when burned skin has begun to feel cool, the flesh *below* this surface could still be

retaining heat, which would continue to damage the tissues.

Sometimes, when you keep a burn in cold water, you may see blisters form. These blisters are a sign that a more serious burn has been prevented: they do not mean that the skin is absorbing water from outside.

Remember, the germs in ordinary water are generally harmless.



On parts of the body which cannot be dipped in cold water, apply a damp cloth and keep wetting the cloth. This also helps to cool the burn.

Do not apply ice directly to burns because the ice itself will cause pain after sometime will make it numb.

***Water is the best medicine for first aid treatment of burns.***

Do not apply any paste or oil on a burn. ***Do not apply any ointment sold from a pharmacy, even if the tube says it is meant for burns.*** These only make it difficult to examine the burn later, and add to the possibility of infection.

Do not apply any raw cotton wool to the burned area as cotton fibers stick to the wound and are difficult to remove.



Try not to break open a blister, or peel off the skin, as this may bring in infection.

However, you may have to break open very large blisters, as they may break on their own if they hit something. But you must make sure that this is done with a sterile instrument. Do not peel off the skin, as the skin can act as a dressing.

Do not apply any antiseptic on a burn. The heat that caused the burn would in any case have killed most of the germs in that area. However, deeper burns do need the help of a surgeon.

When there is a burn, the body loses fluids from the burnt area. The amount of fluid lost is in proportion to the area of skin that is burnt. This is a bit like bleeding from wounds, except that it is not blood leaking out, but clear body fluids.

This can also lead to shock, just as bleeding can lead to shock.

So all patients with large burns, especially burns in many places should be taken to the hospital as early as possible. Large burns may be covered with a clean cloth, for the same reason as you would cover a large wound. Do not try to peel off cloth and other materials sticking to the burn, because you may remove skin along with the cloth, and hurt the patient more.

Burns of the face, hands or feet should also be treated by a surgeon as these burns can easily lead to disability.



If the patient has burns on the face it is possible that he might have inhaled smoke and fumes, and this may have damaged his airway and lungs. Shift all such patients

safely and quickly to a hospital.

Children and old people are less able to cope with burns. In a child, any burn larger than the size of the palm of the hand should be treated in a hospital.

## Chemical burns

Chemical burns are caused by acids, caustic sodas and other such dangerous chemicals. These cause burns when they come in contact with our body and they continue to burn as long as they are on our skin.

***Wash off all such chemicals with plenty of running water.***



Water is the best medicine for first aid treatment of chemical burns.

## **Electrocution**

Electrocution, or electric shock, takes place when a person comes into contact with a faulty electrical gadget, a frayed or broken electrical wire, or a fallen high voltage cable. ***Shut off the power from the fuse box*** before you go near the victim, and stay at least **6 metres** away from a high tension cable, or the current could **arc** towards you.

If the current is very strong, the muscles may get paralysed, and this gives the feeling that you are "glued" or "pulled" to the live wire. In milder shocks, the sudden muscle contraction feels like being "thrown" or "jerked away". Current may also cause an irregular heartbeat, so have the patient checked by a physician.

With electrical burns always look for an entry burn and an exit burn. These are sites from where the current enters and leaves the body. Electrical burns themselves may look small, but they are usually deep.

## **Taking an injured person to the hospital**

If you have to take a patient to a hospital you have to make sure that during shifting he is not hurt more. You have to move him from where he is lying to a carry board or stretcher and then to the vehicle in which he is going to be carried to the hospital.

Any firm board can be used for this. Two or three persons can roll a patient on to a stretcher as though you were rolling a log on the ground.

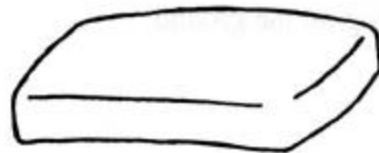
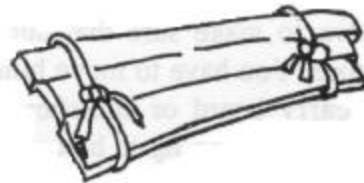


If a ready made stretcher is available then well and good, but it is not essential. What is important is a rigid flat surface which keeps the spine stable and which is easy for you to do resuscitation on. A stretcher can be improvised from



*Any wooden board*

*Two or three board  
Tied together*



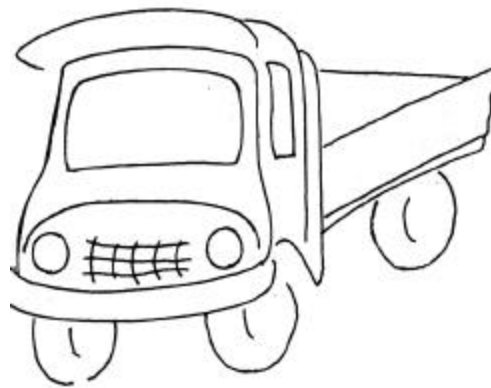
*Bus, tempo, van seats*

While shifting the patients back, neck and airway have to be protected from further injury.

You will need help in this. It is always useful to have help when you are helping the injured.

If the patient is unconscious, gently place a large folded cloth or towel under the neck so that the neck doesn't sag against the ground. This works like a good splint for the neck.

An ambulance is a vehicle which is specifically used to carry a patient to the hospital. The type of vehicle is not as important as whether it can carry a patient comfortably and safely.



The vehicle should have enough space to keep the patient's back straight, and the person accompanying should be able

to care for and resuscitate the patient if necessary.

Though rapid transportation is important, in towns and cities it is not possible to go beyond a certain speed without endangering the lives of patients and those outside the vehicle. It is not necessary to speed while taking patients to hospital. The time saved by speeding is insignificant. In fact, speeding could even cause yet another accident.

Anyway, very few severely injured patients need such rapid transportation in urban areas.





However, at all times during transportation keep a watch on whether the patient's *airway* is clear, whether the patient is *breathing* (a clear airway does not necessarily mean that the patient is breathing), and whether you can feel a *pulse* in the patient. By feeling the pulse you can make out that the heart is beating. A patient may look fine right after the injury but it may take some time before signs and symptoms of injury become obvious.

When the patient is fully conscious and you are sure that he has only a limb injury then he can be safely taken to hospital in a sitting position. Take care to splint or protect limb injuries or bleeding. While in the vehicle try to keep the injured limb from touching the floor of the vehicle. Vehicle bumps are easily transmitted from the floor, and this hurts the patient more.

If the patient has to be carried down a flight of stairs then the chair lift can be used.

In the hills, transporting a patient may be difficult. A chair can be improvised for transport over uneven hill terrain. Some villages already have locally made chairs for transporting the injured.



## Why should it hurt?

Pain is the body's way of warning that you are hurt. Pain is a very important protective mechanism. In some injuries pain may be so severe that the patient may even become unconscious.



There are many medicines that control pain. The best pain killers, however, are also the ones that put you to sleep. So, if you inject a pain killer into a patient who is seriously hurt he may become too drowsy.

This is dangerous, particularly in head injured patients, because a doctor would not be able to make out whether the patient is becoming drowsy because of the head injury or because of the medicine. Some injectable pain killers also hide some of the signs of seriousness and worsening in a head injury. These should only be given by a doctor. Giving medicines by mouth may also be risky as the patient could choke.

The best way of controlling pain in an injured limb is to splint it, or to reduce movements of the injured part.

## Protecting yourself while you help

While you are giving first aid you must take care that you protect yourself and others around you.

If the patient is in a hazardous location seek help to shift him to a safer location. Shifting must always be done safely, protecting the back and airway of the patient.



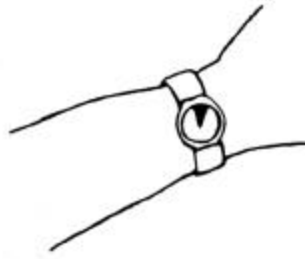
Whenever a patient is bleeding try not to get any blood onto your skin. Blood could contain other infections

already present, and these could be passed on. Use any barrier between you and the patients blood. Use anything that is available: cloth, paper, polyethylene or even a large leaf.

If soap is available, always wash your hands thoroughly after you give first aid. If there isn't any soap, then wash off all the blood and body fluids you have got onto your hands with plenty of water.

## When life seems to slip by...

When the injury is serious enough the patient may stop breathing, or his heart may stop beating. If breathing and heart beats are not restored within 4 to 5 minutes the patient will die.



Time is critical. Rarely have patients survived longer periods without breathing or their heart beating.

The air we breathe in contains about 21percent oxygen and the air we breathe out contains about 16percent oxygen. This 16percent is enough oxygen for resuscitating a patient who is not breathing.

If you are near an injured person who is unconscious and probably not breathing, this is how you should respond.

*Call for help*



***Check for breathing:*** look,listen and feel for breathing. Put your ear near the patient's nose, while you look at the chest to see if it rises and falls. You may hear the sound of breathing and feel the breath against your face.



If the patient is not breathing and the airway seems to be clogged, ***open the patient's mouth***, cover two of your fingers with cloth, and with one sweeping movement clear out the mouth.



***Lift the chin*** and move the jaw gently forward to make sure that the patient's tongue does not fall back and block the throat.



If the patient is still not breathing, then give ***two*** quick breaths, as shown.

Cover the patient's mouth completely and pinch the patient's nostrils shut while you are doing this.



If you do not do this the air you breathe in will leak out through the nostrils and not reach the patient's lungs.

You may not feel comfortable doing this to strangers, particularly when there is vomitus and blood around the patient's mouth. These could be quickly wiped off with a piece of cloth, and if you feel more comfortable, cover the patient's mouth with a thin cloth like a handkerchief, or gauze.

Do not try breathing through a thick cloth, or the air you breathe in will not get through.

If you watch a normal person breathe in and out, you will notice that the chest rises and falls with each breath. Similarly, when we breathe into a patient, his chest must also rise and fall.

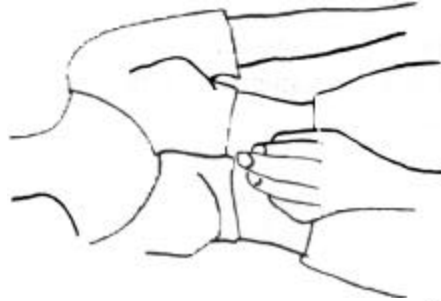
If the chest does not rise and fall, then the patient's throat or wind pipe may be clogged, or your breathing effort may not be strong enough.

Pull the patient's jaw a bit further forwards, and try again.



## The "Heimlich manoeuver"

If expired air resuscitation does not improve the chest movements then try what is commonly known as the 'Heimlich manoeuver'. In this manoeuver, the patient is made to lie on his back, and 6 to 10 thrusts are given to the abdomen, inward and upward, with the heel of your palm.



Place your hand a little above the navel as shown and direct your thrusts towards the chest.

If you think there may be something blocking the windpipe of a child less than one year old, turn the child over onto its stomach, keeping the head **lower** than the rest of the body, and give **four sharp thumps to the back**.



These thumps have to be sharp in the sense of *abrupt* and *sudden*, as they have to dislodge something that is stuck.



Then turn the child over again onto its back, still keeping the head lower than the rest of the body, and give *four sharp thumps to the chest*.

Whatever is stuck in the wind pipe may have come to the mouth by now. Lift the jaw and remove it with your finger. If there is nothing there, and the child still cannot breathe, repeat the whole sequence. Do not breathe into the patient too strongly as this only distends the stomach with air. This could lead to vomiting and choking.

You will notice that attempts to clear the airway take priority over everything else. This is because without a clear airway breathing is not possible. Unless blood is oxygenated by the air breathed into the lungs, pumping of blood by the heart is useless. Within about five minutes the heart will stop functioning.

## Pulse

If you feel that your breathing into the patients mouth has been strong enough to pump in some air into his lungs, proceed to see if his heart is working, by checking for his pulse.

Our heart keeps pumping blood to all parts of our body. It beats about 70 times in a minute. It beats faster when you are running, and slower when you are sleeping. The rate depends on the body's need for oxygen.

By feeling the pulse you can make out that the heart is beating. In an unconscious patient it is easiest to feel for the neck pulsations. Feel for the Adam's apple, or voice box, in the neck and pass



your hand away from the middle into the hollow on the side of Adam's apple. ***Do not feel for both sides of the wind pipe at the same time, as this can cause the heart to suddenly stop beating.***



Normally, the tips of your index and middle finger are most sensitive to touch. Use your index, middle and ring fingers for this.

A doctor feels for pulse at the wrist. But in patients who have bled profusely this pulse may be too weak to feel, while the heart may still be beating. So it is better to feel for the *neck pulsations*, because these are easier to feel even when the heart is beating feebly.

If the patient's heart is not beating, then you will not be able to feel any pulse.

## External cardiac massage

Once you have confirmed that the patient's heart is not beating, begin what is known as *external cardiac massage*. This is a technique in which blood is "squeezed" out of the heart by pressing the chest between the heel of your palm and a hard board below the patient.

If the patient is lying on a soft mattress or bed, the massage will be ineffective. Either shift him on to the ground

or floor, or slip a wooden board underneath him. If this is not done then the compression will only push the mattress down, and not the chest.

The procedure for external cardiac massage needs to be practiced on a mannequin or dummy before you have the confidence to do it on a patient. The steps in this procedure are shown on the following pages.

Feel for the lower margin of the rib cage with your right hand. Find the notch in the middle of the front of the chest by passing your finger up along the lower margin of the rib cage.



Keep the heel of your left hand next to the index finger of your right hand.



Shift your right hand over your left



Thrust vertically down onto the patient's chest keeping your elbows straight. This



is more effective and less tiring than thrusting down with your elbows bent.

While you do this, *see that the chest goes down about one and a half to two inches.*

Pushing it too hard will break the patient's ribs, and pushing it too lightly will be ineffective.

***Release compression without moving the position of your hands.***

***Repeat this at an even pace 15 times.*** You could count loudly to keep track of the number of times you have done compression. Do these compressions at an even pace, taking about 10 seconds for 15 compressions.

*After the fifteenth compression, give two breaths as before.*

*Keep repeating these cycles of 15 compressions and 2 breaths.*

*After every fourth such cycle feel for the pulse.*

It is useless giving external cardiac massage without giving **mouth-to-mouth breathing** at the same time because you would only be re-pumping the same old blood without any new oxygen being added to it.

If the patient's heart has not started beating, continue these steps for external cardiac massage, and mouth-to-mouth breathing until medical help is available, or until the patient is shifted to a hospital.

If you are shifting the patient or calling for help, **do not stop mouth-to-mouth resuscitation and external cardiac massage for more than seven seconds.**



In babies less than one year old you will not be able to pinch the nostrils shut and give mouth-to-mouth resuscitation at the same time. Cover **both** the mouth and nose with your mouth, and give a **mouth-to-mouth-and-nose resuscitation.**

With children below the age of one, use two fingers for chest compression. The correct place to compress is **2 cm. below the nipple line.**

With children older than one, do the same as for adults, except that ***you should use only one hand for chest compression and give one breath for every five compressions.***

Children's hearts also beat faster than adults' hearts, so you have to give ***five compressions to one breath*** instead of fifteen compression to one breath, as you would do with an adult. This is because children need oxygen more quickly than adults.

Both expired air respiration and external cardiac massage (heart massage) need to be practiced several times before one will have the confidence to do it in a real-life situation. Even professionals have to be re-tested and re-certified regularly for doing external cardiac massage.



## Drowning

Drowning simply means that water is entering the lungs and choking the person. In drowning, the person also swallows large amounts of water. This leads to vomiting. The patient could also choke in his own vomitus.



Immediately turn the patient to her side and clear out her mouth. This helps to remove both water and vomitus.

If the patient is not breathing start mouth-to-mouth breathing. Give five breaths and check for pulse. In case there is no pulse start resuscitation as above.

If someone has seen the patient dive into the water, or if the person has been found in shallow water, there may be spinal injury. Take all precautions for a spinal cord injury in addition to resuscitation.

## Do you need a first aid kit?

Experience has shown that most of the medicines, antiseptics, bandages and implements usually found in first aid kits are not necessary for first aid.

In fact, if you do not use bandages and dressings promptly, they usually gather dust containing all kinds of bacterial spores and, if the air is damp, they will even grow fungi. Some bandages and dressings are sold in sterile bags.

These, too, may grow harmful organisms if they are not checked regularly for damage and for expiry dates. A clean cloth from the washing line would be safer and better.

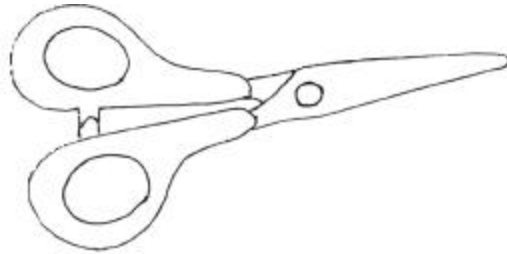
You really do not need anything special in a first aid kit. The following items could be useful while you are doing first aid.



*a set of large safety pins*  
to make slings and splints



*a pair of tweezers*  
to take out splinters  
and thorns



***a pair of scissors***  
to cut cloth bandages and dressings



***a cake of soap***  
to wash small wounds, to remove grease and dirt  
and to wash your hands after you have given  
first aid

## When disaster strikes...

A disaster is a situation where a large number of people get injured together. Earthquakes, cyclones and fires are typical examples of disasters.

In disasters you would not be able to attend to all of the victims. You would also need to *improvise* much more than in a normal situation. Instead of trying to save *one* seriously injured patient you would have to find ways to save *many*. You should do your best to stretch out whatever materials and time are available to give help to the maximum number of patients.

Crowd management is most important. Organising people and resources is also important. You will have to keep bystanders away from the injured, so that helpers can get on with rescue operations.

People will need to be organised into groups: one group for comforting the victims, their friends and their relatives, another group for transporting the patients, and another group for actually doing the first aid.

## **After reading this book...**

Now that you have gone through this book you may have a good idea of what you can do when someone near you is hurt.

Perhaps you are confident enough to tackle whatever injury you may be faced with. You may even be scared at the thought of some dangers involved in the care that you give to the injured.

You may have more questions than answers. Don't worry. Having doubts and questions and being unsure are normal in any learning process. The most important thing is to have the desire to help. If nothing else, just call for help, or carry the patient to a hospital as best you can. That is better than being just a bystander.

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Transportation Research and Injury  
Prevention Programme  
WHO Collaborating Centre  
Indian Institute of Technology  
Delhi

