

Australian First Aid, St John Ambulance Australia's comprehensive first aid manual, designed specially for Australian conditions and presented as a two volume set.

Volume One contains all the information needed to cope with an accident or emergency, including: the St John DRABC Action Plan; management of life-threatening conditions; management of commonly encountered injuries and illnesses.

Volume Two contains specialist sections on: how the human body works; sports injuries; first aid at work; advanced resuscitation.

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- 1 What a first aider uses
- 2 Safety
- 3 The DRABC Action Plan
- 4 More about resuscitation
- 5 Shock
- 6 Bleeding
- 7 Wounds
- 8 Burns
- 9 Limb injuries
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- 14 Care of the acutely ill
- 15 Poisoning
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St John Ambulance
Australia



Australian First Aid

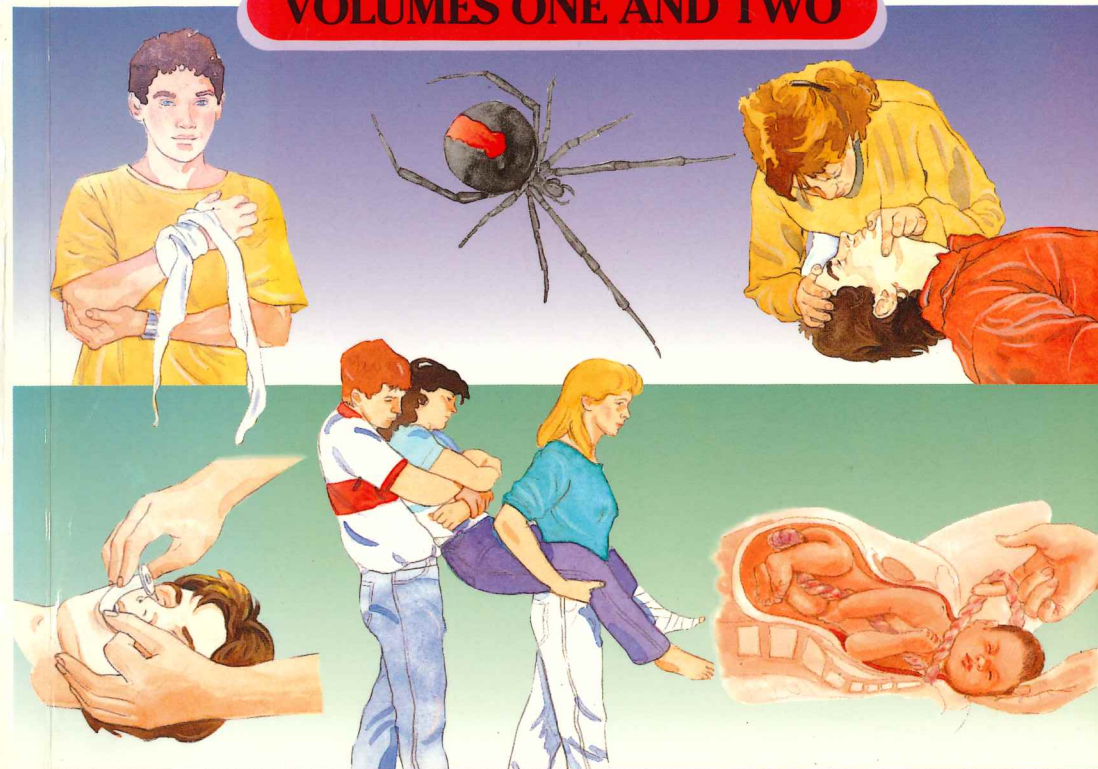
VOLUME TWO
VOLUME ONE

St John Ambulance
Australia



Australian FIRST AID

VOLUMES ONE AND TWO



An authorised manual of
St John Ambulance Australia

Australian

FIRST AID

Second Edition

VOLUME ONE



**An authorized manual of
St John Ambulance Australia**

St John Ambulance Australia
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Australian first aid volumes one and two

Includes index

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Foreword

First aid remains one of the most important of all life's skills. The simple yet essential skills to preserve life in an emergency, to protect a casualty and to hasten the healing of wounds, are skills which no parent, partner, motorist or workmate can do without. Acute illness and sudden injury have no respect for age or status, or place or time. It is thus one of the imperatives of modern living to 'do the right thing' by those around us. *Australian First Aid* is one vehicle by which these important skills can be achieved.

Australian First Aid has for several years been an Australian best seller. It is the major resource for the teaching of first aid to the Australian public. Tailored for Australian conditions, it has a special relevance for all those who wish to acquire these essential skills.

This current text is continually modified and updated as new conditions occur. The text is thus topical and relevant, and is one of the cheapest forms of insurance to help save life, to protect casualties, and to hasten the convalescence of the sick and injured.

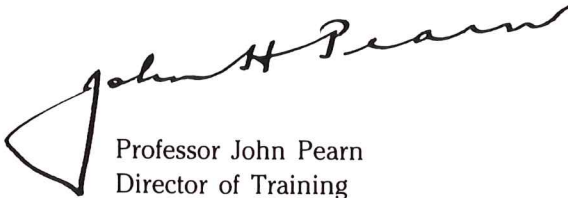
This book has been divided into two parts for easier handling. Volume 1 comprises chapters 1 to 19 and is designed to accompany the St John Ambulance Australia Senior First Aid course. It provides information for emergency first aid and the management of common injuries and illnesses. Volume 2 comprises chapters 20 to 31 and contains advanced and specialist information.

First aid is a practical subject. The approach to helping the victims of injury and illness depends on a firm practical foundation of being able to make a diagnosis, and to commence

management as a true 'hands-on' skill. This book will take you through these points, together with a minimal theoretical component, to help you understand what you are doing. The steps in management of a wide variety of important illnesses and injuries have been simplified in this text, and every attempt has been made to ensure that the subject material is relevant to everyday life.

Australia is well supplied with emergency services. However, the great size of the country makes it impossible for those services to be available in all circumstances, and at all times and in all places. St John Ambulance Australia believes that this text will provide you with the information that will be useful in the widest variety of real life circumstances that you may encounter.

While the text sets out in detail the steps in diagnosis and management, it is no substitute for a practical first aid course. Participation in such a course will give you the confidence, as well as the experience, to become fully proficient and skilled in the management of the ill and injured.

A handwritten signature in black ink that reads "John H. Pearn". The signature is written in a cursive style with a large, stylized initial 'J' that loops back under the first name.

Professor John Pearn
Director of Training

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Introduction

What is first aid?

- the initial care of the ill or injured.

The aims of first aid

First aid aims to:

- promote a safe environment
- preserve life
- prevent injury or illness from becoming worse
- help promote recovery
- protect the unconscious
- reassure the ill or injured.

The first aider aims to prevent:

- further danger to himself, others or the casualty
- the casualty dying
- the casualty's condition becoming worse
- delay in the casualty's recovery
- any harmful intervention.

What is medical aid?

- treatment by a doctor, registered nurse or ambulance officer.

First aid begins when the first aider arrives at the scene of an incident, and continues until the casualty recovers, or medical aid arrives. The first aider may be required to remain and assist.

How to seek medical aid

If possible, send someone else to seek medical aid immediately. Do not leave the casualty. However, if you are alone at the scene of an incident, and it is unlikely that anyone will arrive for some time, you will need to leave the casualty and seek help as soon as possible.

Messages should be brief. You should confirm that they are understood. State your telephone number, the exact place with directions, the time and nature of the incident. Give the number of casualties with an indication of their condition. Ask the likely time of arrival of aid.

Describe location			
Name of district, suburb, etc:	NUNAWADING		
Name of street, road, highway, etc:	Maroondah Hwy		
Nearest cross street (suburban):	Springvale Road		
Distance from town or major landmark (country) kms		
North <input type="checkbox"/>	South <input type="checkbox"/>	East <input type="checkbox"/>	West <input type="checkbox"/>
of(describe town or landmark)		
Give accident details			
Number of people hurt	3 (2 adults, 1 infant)		
Time of accident (if known)	3.15 am approx		
Time this message written	3.21 am		
Notes	Truck and family sedan have collided		
	on corner - Big petrol spill. Infant		
	critical. Melway 48 F9 (1984)		
		
		

0.1 How to seek medical aid

1

What a first aider uses

First aid kits

Bandages

Slings

Bandages

These are used to:

- control bleeding
- keep dressings in position
- give support and pain relief
- restrict movement
- immobilize fractures, usually with the aid of splints.

Dressings

Dressings should be:

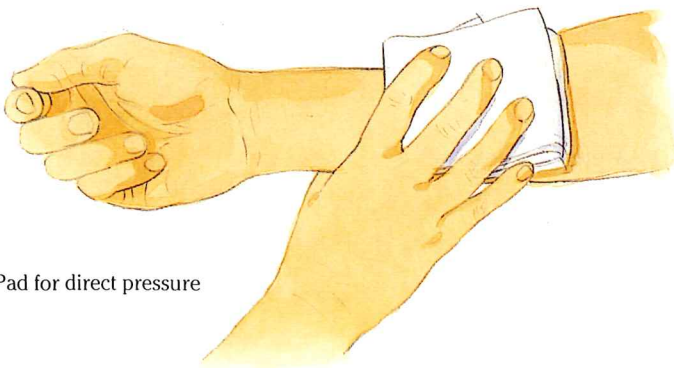
- sterile or clean
- non-stick.

They may be made from a single square of clean cloth. They are used to:

- control bleeding
- protect wounds
- minimize swelling
- prevent infection
- ease pain.

Pads

Pads are applied over a dressing for direct pressure. A folded triangular bandage may be used.

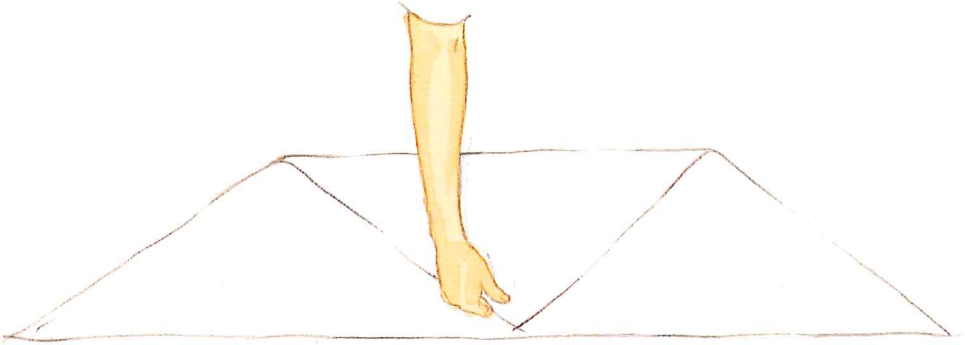


1.2 Pad for direct pressure

Triangular bandages

Triangular bandages can be used as dressings, pads, padding or slings. If used to bandage a wound, they should be secured with a reef knot. They can be made by cutting a one metre square piece of cloth into two diagonal pieces. To fold a triangular bandage as a pad:

- fold in half, i.e. point to base



- fold in half again to make a broad bandage



- fold in half again to make a narrow bandage



- fold ends to middle



- repeat



- fold what is left in half to make a pad. This may be easily packed away in your first aid kit.



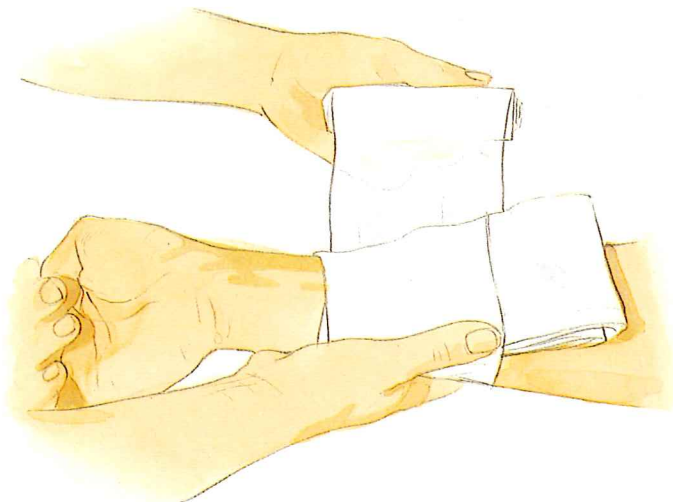
1.3 Folding a triangular bandage

Roller bandages

These are made from long strips of material and come in different widths. They can be used to make a simple spiral for use on parts of the body that are fairly straight, such as the wrist or fingers:

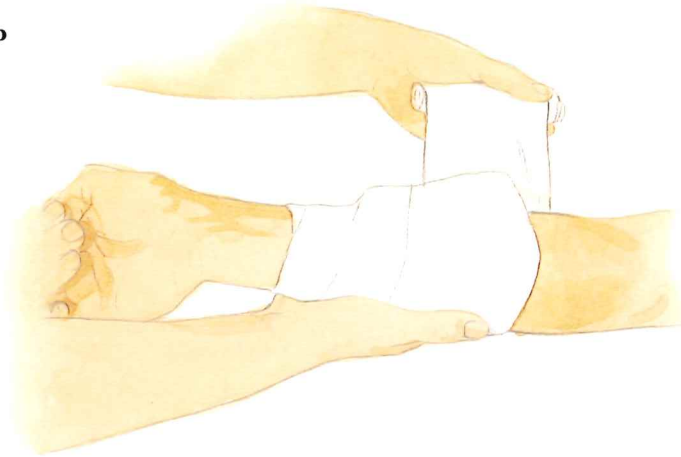
- begin with the head of the bandage facing upwards and the tail pointing in towards the casualty

1.4 a



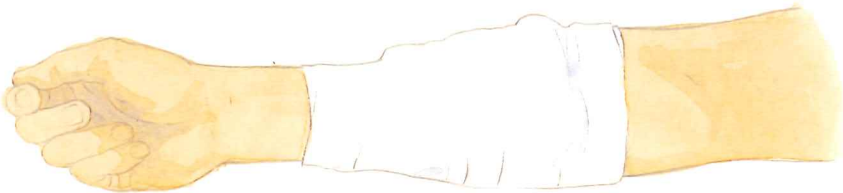
- carry the bandage around the limb in a spiral pattern

b



- each turn of the bandage covers two-thirds of the one before it and the edges should be kept parallel. Fasten the end with a safety pin, adhesive tape, or tuck in.

c



1.4 a-c Applying a roller bandage

The reef knot

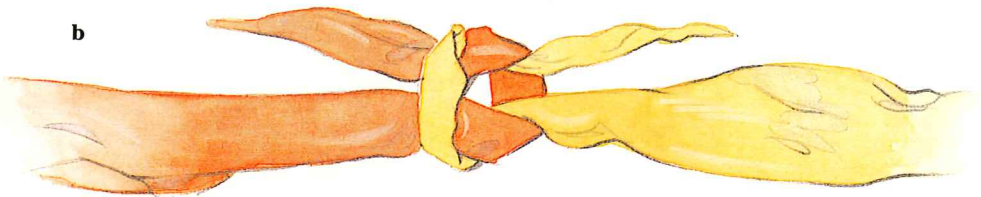
Use a reef knot to secure bandages and slings because:

- it will not come undone easily by itself
- it is flat and will not dig into wounds
- it is easily undone by anyone managing the casualty.

a



b

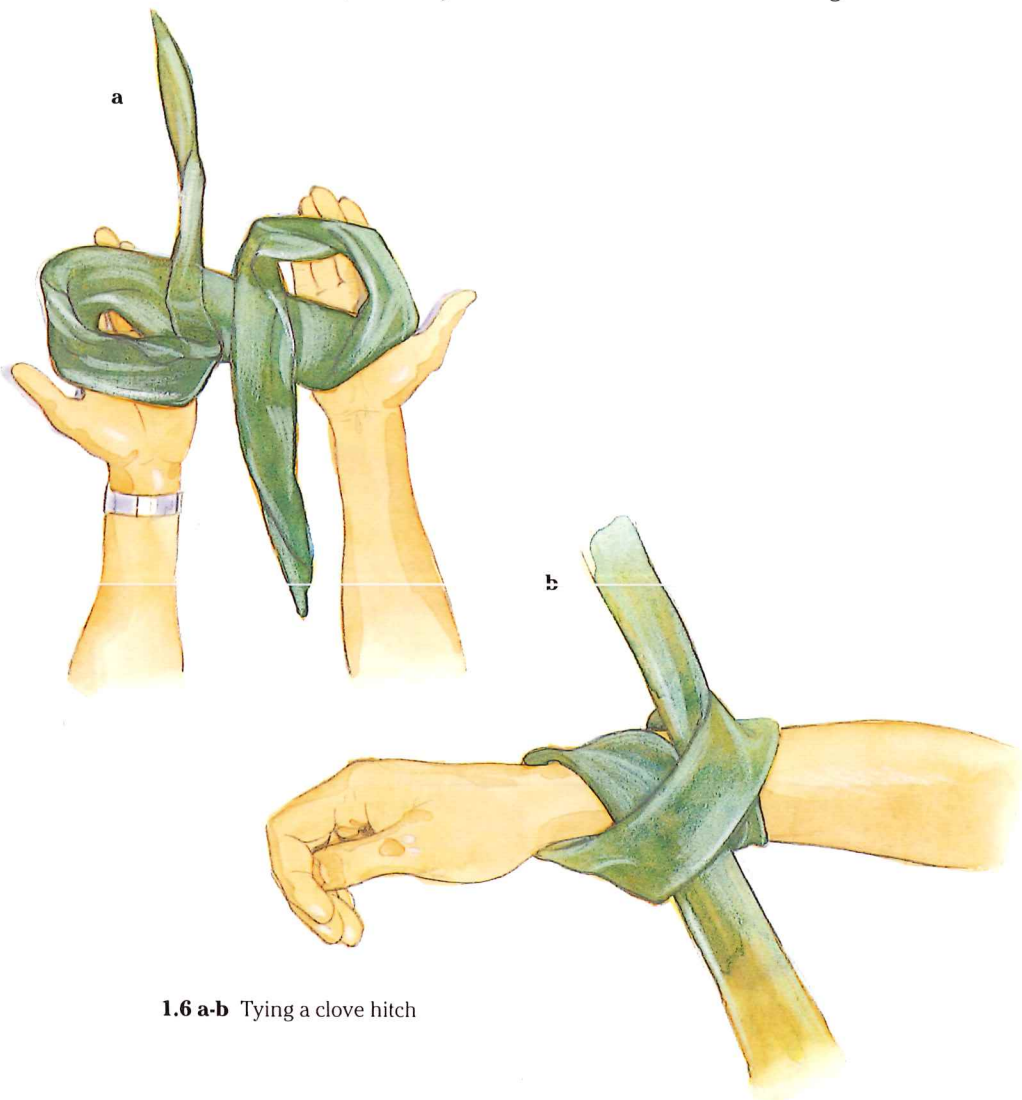


1.5 a-b Tying a reef knot

The clove hitch

This is used to make a collar and cuff sling:

- make two loops — one towards you, the other away from you.
- Place your fingers under the loops and bring them together
- slide the loops over your arm with the loose ends together.

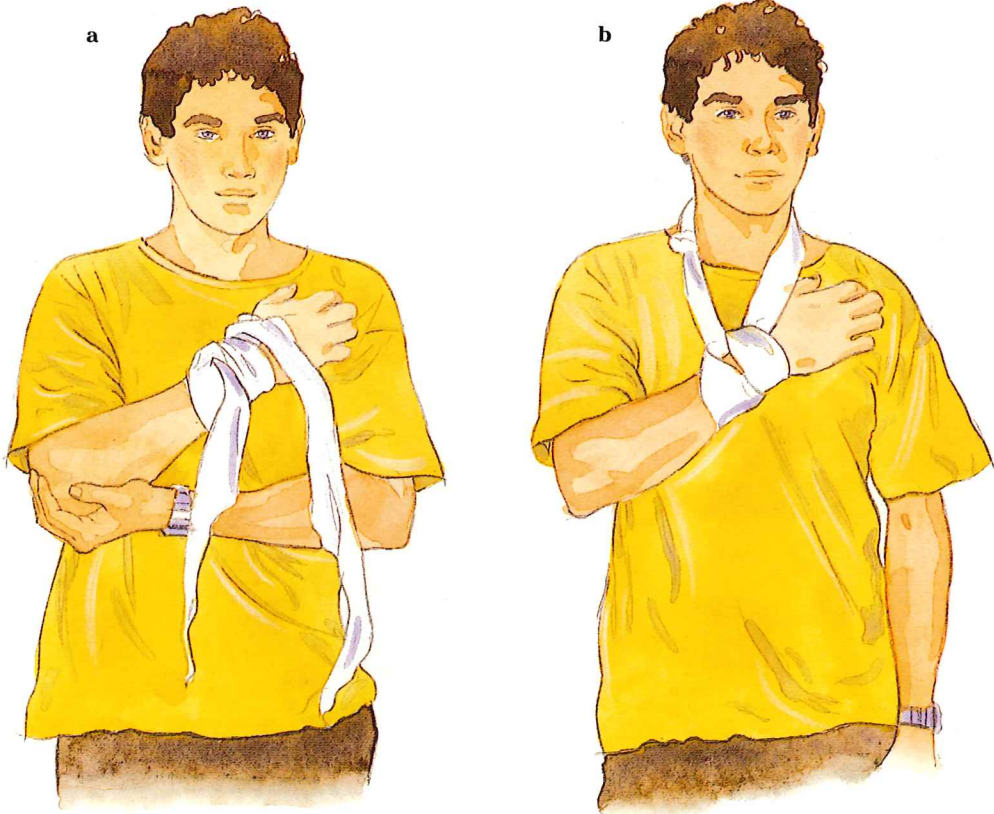


1.6 a-b Tying a clove hitch

The collar and cuff sling

This is useful for the casualty with a fracture of the upper arm or an injured hand:

- make a clove hitch, using a narrow bandage
- put the loops over the wrist of the injured arm
- gently elevate the injured arm against the casualty's chest
- tie the bandage ends together around the neck using a reef knot.

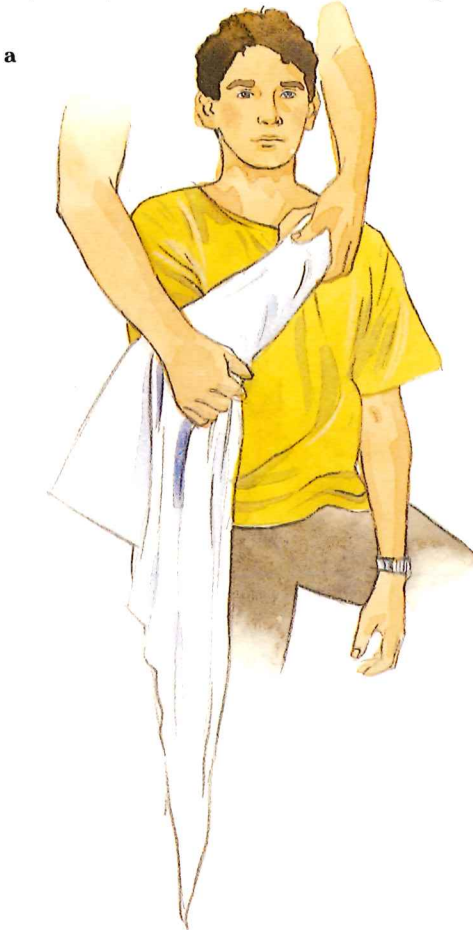


1.7 a-b Applying a collar and cuff sling

The St John sling

This supports the elbow and prevents the arm from pulling on an injured shoulder or collarbone:

- lay the casualty's arm naturally by the side with the elbow bent and the forearm across the chest. The fingers should point to the opposite shoulder
- place an open triangular bandage over the forearm and hand, with the point to the elbow and the upper end over the uninjured shoulder
- support the limb and tuck the base of the bandage under the fingers, hand, wrist and forearm, making a trough



- carry the lower end around the back to the front of the uninjured shoulder. Gently adjust the height of the sling
- tie the ends as close to the fingers as possible
- tuck the point firmly in between the forearm and the bandage
- when you are sure that the sling is firm, secure the fold with a safety pin.

b**1.8 a-b** Applying a St John sling

The arm sling

This is used for injuries to the forearm and wrist:

- place an open triangular bandage over the chest with the point towards the elbow on the injured side



1.9 a-c Applying an arm sling

- take the upper end of the bandage over the shoulder on the uninjured side. Bring the injured arm slightly above the horizontal position
- tie the lower end to the upper end in the hollow above the collar bone on the injured side. Carefully arrange the bandage so that the fingers are showing
- fold the corner by the injured elbow and secure it with a safety pin. Check the circulation by applying gentle pressure to a finger nail. When you stop pressing it, normal colour should return rapidly to the nail bed.



Remember: check if bandages are too tight. You may notice:

- absent pulse below the bandage
- swelling
- paleness or blueness of the fingers or toes
- numbness and tingling ('pins and needles') of the fingers or toes
- pain.

If bandages are too tight, they must be loosened. Recheck for these signs at regular intervals, or if the person complains of tightness.

2

Safety

In the home

In case of fire

Outdoors

Water sports

In the bush

In the desert

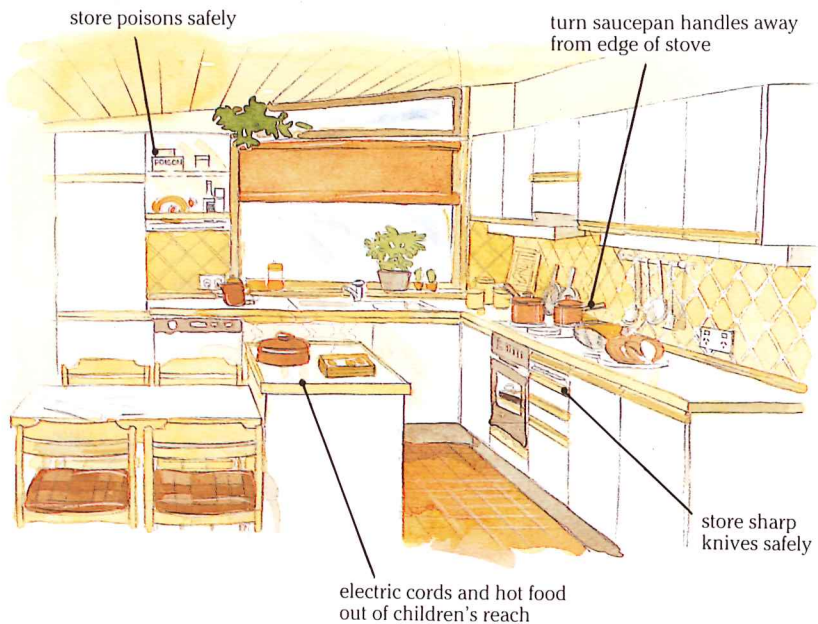
In the workplace

All first aiders should be safety conscious. Safety rules and commonsense help to prevent accidents. Use these checklists to determine your level of safety awareness, and to identify changes that should be made to make your environment a safer place.

In the home

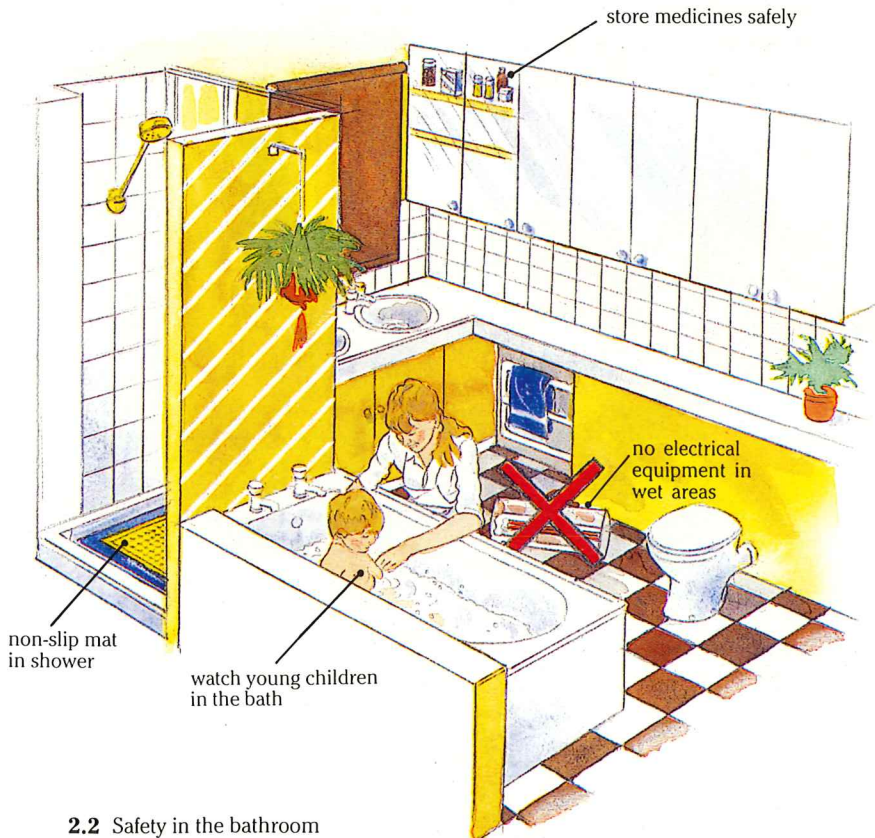
Have you:

- checked your home for objects that may cause injury?
- placed eye level markings on glass doors?
- selected safe toys for your children and ensured that they are kept in safe condition?
- stored firearms safely and out of reach of children?



2.1 Safety in the kitchen

- attached non slip backings to rugs to prevent falls?
- checked electrical goods regularly for unsafe wear?
- stored poisonous substances out of reach of children?
- destroyed unwanted medicines by returning them to your pharmacist or (where this service is available) arranging for them to be collected by the local Council or Water Authority?
- provided your children with clothing made from non-flammable material and of a form-fitting design if likely to be near open fires or radiators?
- provided a guard for fires or radiators?
- stored plastic bags safely?



2.2 Safety in the bathroom

electric cords
out of children's
reach

store soaps and
detergents safely



2.3 Safety in the laundry

dry up spilled water



2.4 Safety in the bedroom

In case of fire

Do you:

- have the emergency telephone number handy?
- have a fire extinguisher in a central place (not near the stove)?
- have a fire blanket or woollen blanket in the kitchen for use on burning oil?

- know the safety rules in case of fire?
 - call the fire brigade from a neighbour's home
 - if safe, shut all doors and windows
 - turn off all electric power
 - assemble all people who evacuate the building at one point
 - extinguish the fire if possible.

Outdoors

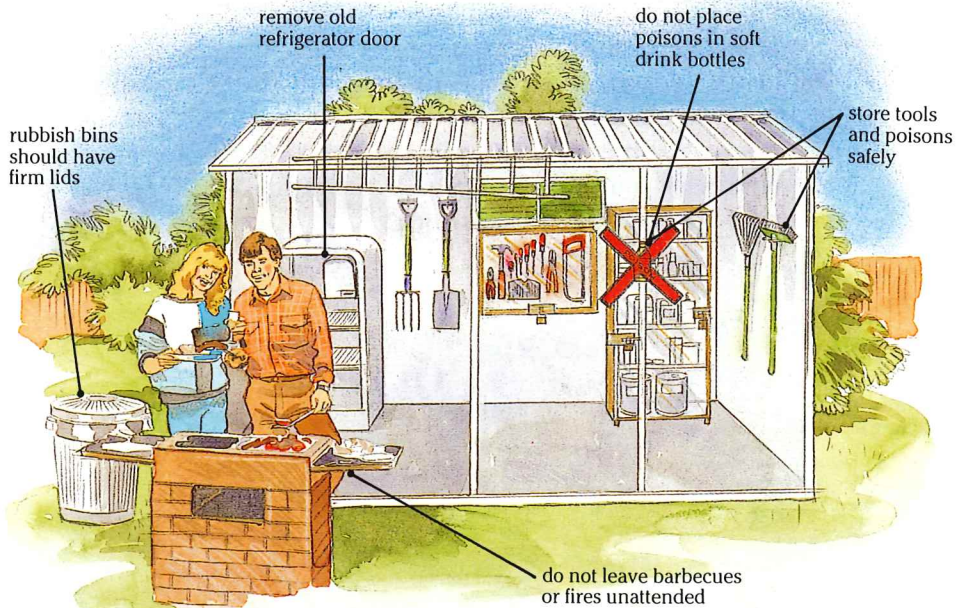
Do you:

- regularly update first aid skills and knowledge if you have a swimming pool?
- wrap broken glass with thick layers of paper before discarding?
- store pool chemicals away from petroleum products?
- label and store poisons, e.g. weedkillers, kerosene, safely?

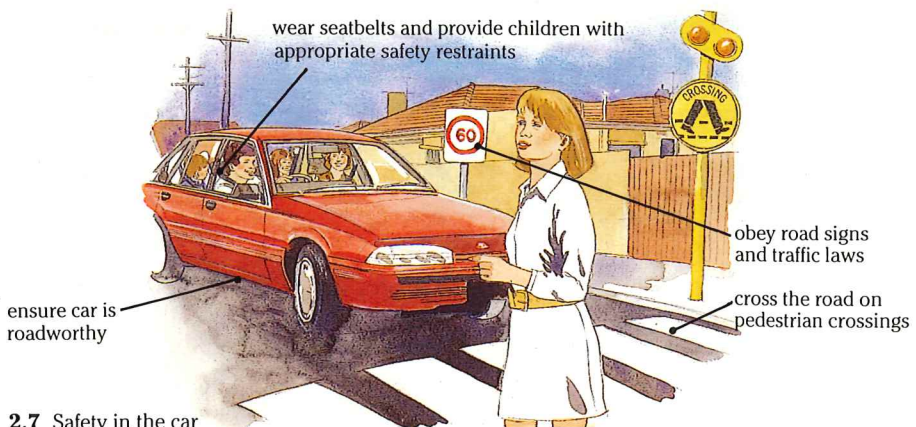


2.5 Safety at the swimming pool

- have your car, caravan and trailer checked regularly for roadworthiness?
- ensure children are in full view when reversing the car?
- ensure children are never left unattended in a car?



2.6 Safety in the garden

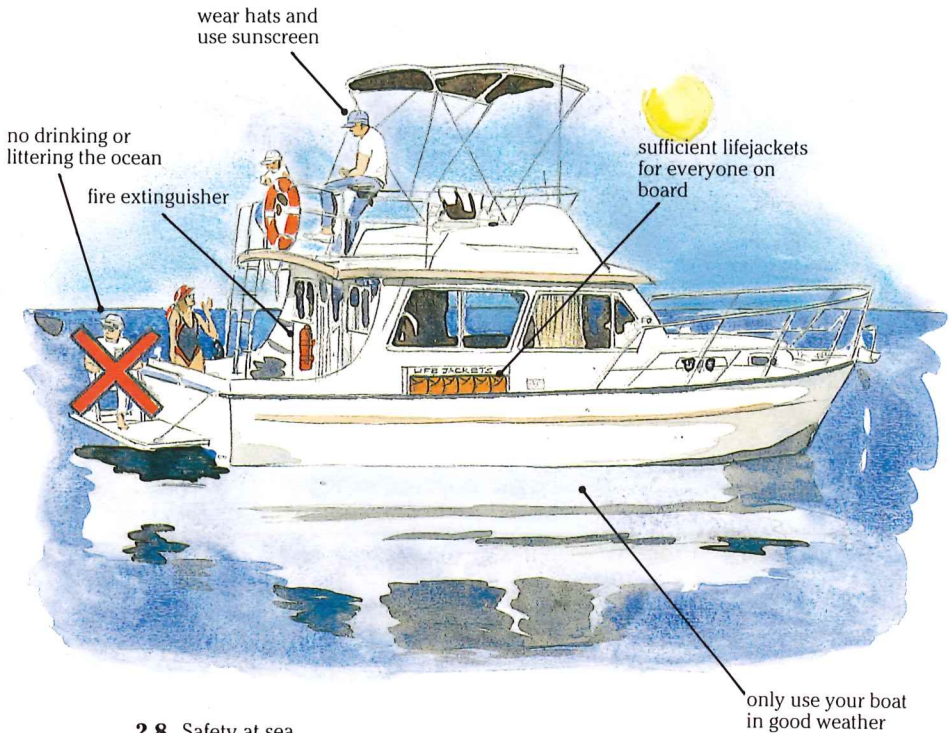


2.7 Safety in the car

Water sports

Do you:

- carry safety equipment and sufficient fuel and water when boating?
- know the distress signals and local regulations for boating?
- check the boat and ensure the engine is in good working order before use?
- ensure that there are no petrol spills or leaks when boating?
- always tell someone where you are going and what time you expect to be back when boating?



2.8 Safety at sea



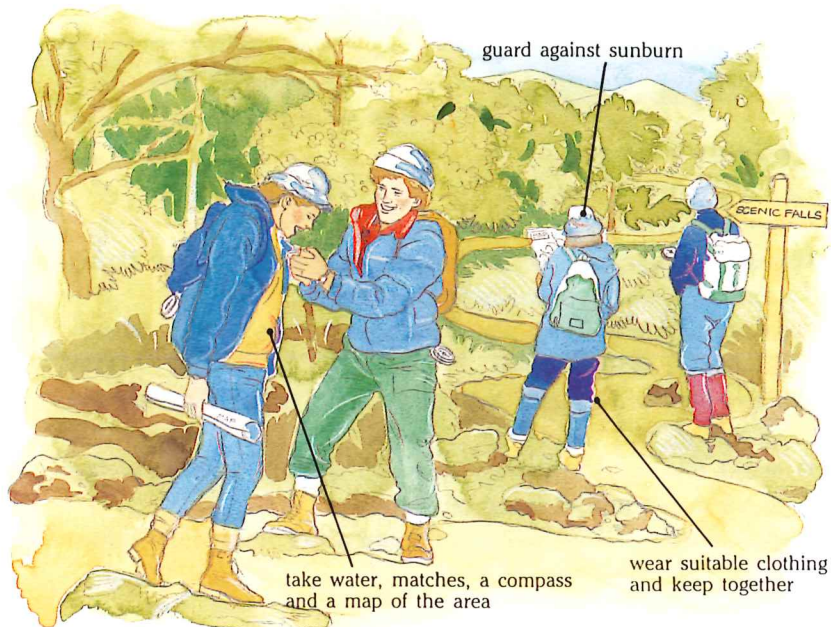
2.9 Safety at the beach

- consider other people, both swimming and in small boats, and always slow down near them?
- avoid swimming in isolated rivers or dams unless accompanied by other people?
- thoroughly investigate swimming holes before entering the water?
- avoid diving in unknown rivers or dams until sure of the water depth and absence of obstacles?
- ensure that you can easily get out of a swimming hole before entering?

In the bush

Do you:

- always hike or camp with companions?
- inform someone about where you are going, when you plan to arrive and return?
- take water, matches, a compass and a map of the area?
- wait for help if lost and keep together with other members of the party?
- label all dangerous items clearly and make sure that stoves and lanterns are safe?
- ensure that containers of hot food cannot be tipped over?
- ensure that collapsible tables and chairs are safe?
- wear appropriate clothes and thick-soled shoes?
- protect yourself against sunburn and insect bites?
- make sure your camp fire is out before leaving?
- know how to prevent overexposure to heat or cold?



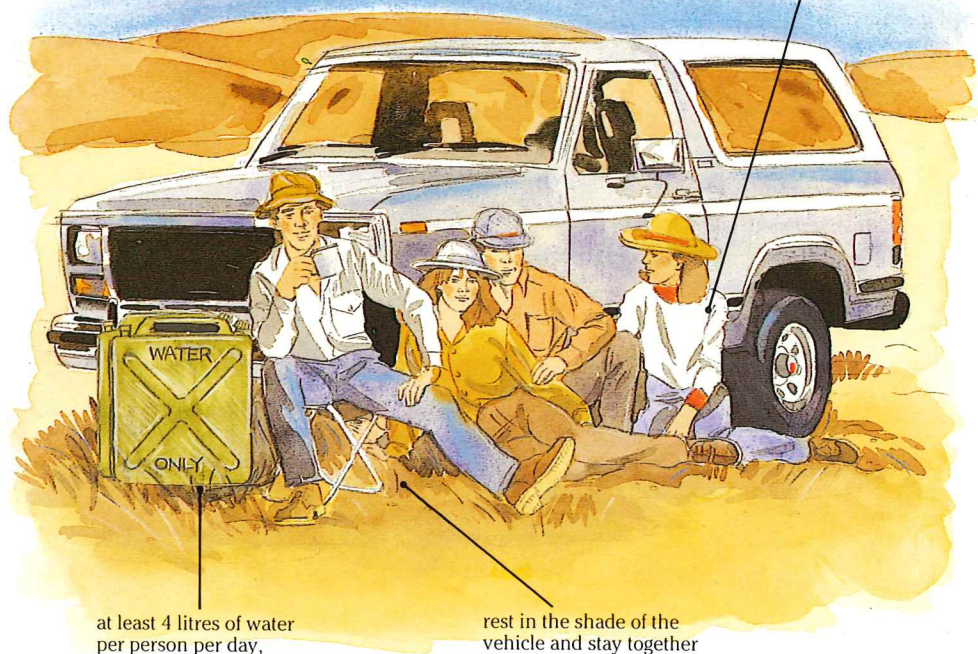
2.10 Safety in the bush

In the desert

Do you:

- carry adequate supplies of water? At least 4 litres per person are required for drinking each day in hot weather
- know how to lay adequate signals for rescuers if an emergency does occur in remote desert country?
- know the rules for survival in the desert?
- take a CB radio for communication purposes?

wear hats, long sleeves and trousers, and thick-soled boots



at least 4 litres of water per person per day, stored in shade

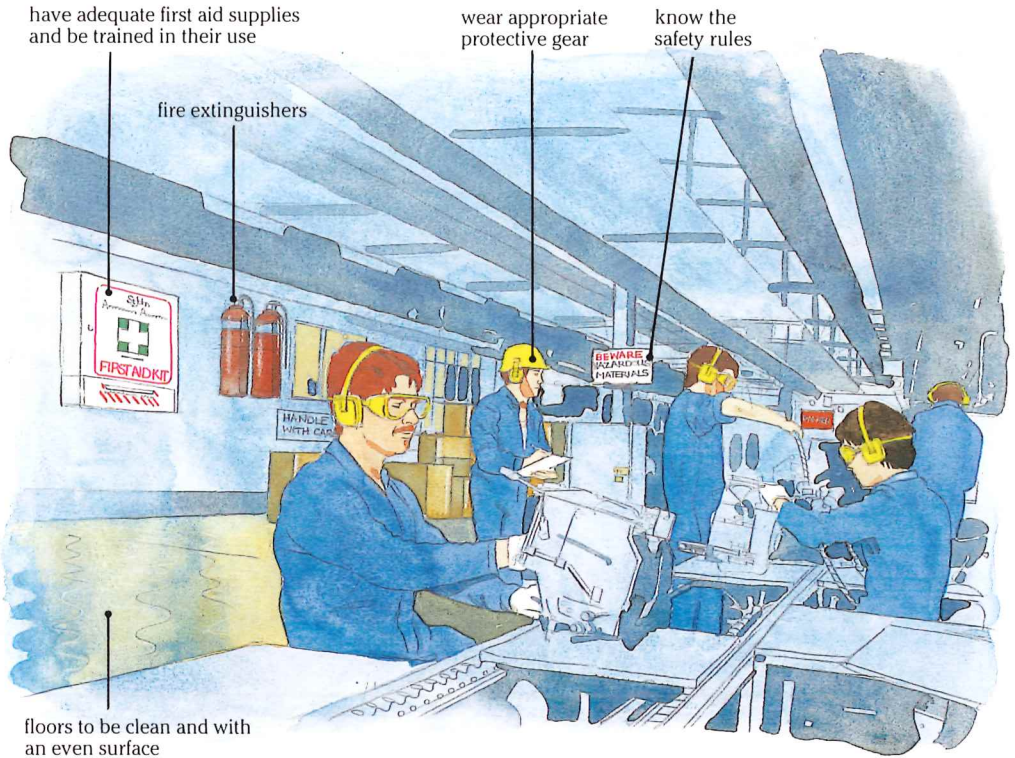
rest in the shade of the vehicle and stay together if lost

2.11 Safety in the desert

In the workplace

Are:

- working conditions safe?
- all personnel safety aware?
- safety and first aid officers trained?



2.12 Safety in the workplace

Everyone has a responsibility to be alert to possible dangers and to prevent accidents.

3

The DRABC Action Plan

Danger

Response

Airway

Breathing

Circulation

When you approach the scene of an accident or emergency, follow the DRABC Action Plan:



DANGER

RESPONSE

AIRWAY

BREATHING

CIRCULATION

D Check for *DANGER*

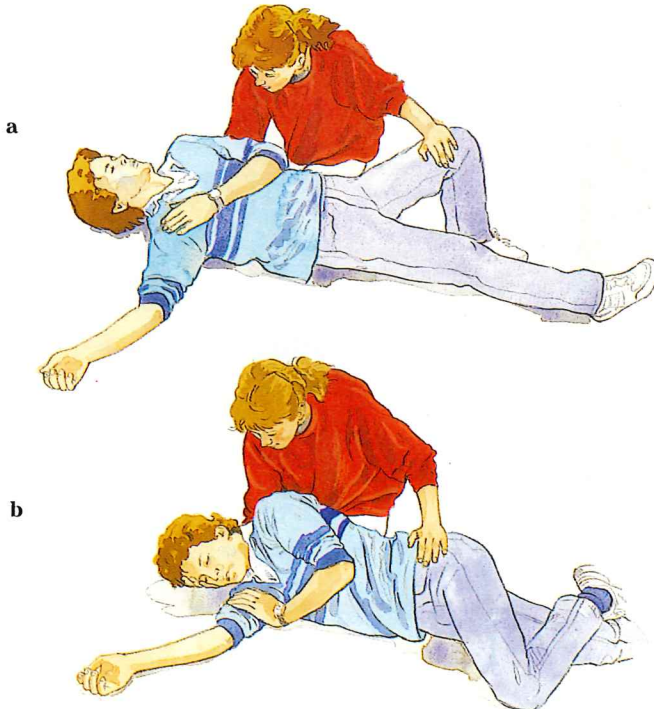
- to you
- to others
- to the casualty
- make sure that no one else gets hurt. You will not be able to help if you are also a casualty
- only proceed if it is safe to do so.

R Check *RESPONSE*

- is the casualty conscious?
- gently shake the casualty and ask: 'Can you hear me?', 'What is your name?'
- if the casualty is **conscious**, check for and manage bleeding and other injuries
- if the casualty is **unconscious**, he/she should be turned on the side.

Turning an unconscious casualty on the side to clear and open the airway

- 1 Kneel beside the casualty.
- 2 Place the casualty's farther arm at a right angle to the body.
- 3 Place the nearer arm across the chest.
- 4 Bend the nearer knee up.
- 5 Roll the casualty away from you. Support the casualty in this position until airway and breathing have been checked.



3.1 a-b Turning an unconscious casualty on the side

A Clear and open the AIRWAY

Clearing the airway

- 1 With the casualty supported on the side, tilt the head backwards and slightly down.
- 2 Open the mouth and clear any foreign objects. Only remove dentures if loose or broken.



3.2 Clearing the airway

Opening the airway

- 1** Place one hand high on the casualty's forehead.
- 2** Support the chin with the other hand.
- 3** Gently tilt the head backwards.
- 4** Lift the jaw forward and open the casualty's mouth slightly.



3.3 Opening the airway

B Check for *BREATHING*

- look for the chest rising and falling
- listen for the sound of breathing
- feel with your cheek
- if the casualty is **breathing**, ensure that he/she is in a stable side position. Check for and manage bleeding and other injuries
- if the casualty is **not breathing**, turn onto the back and commence EAR (expired air resuscitation), giving 5 full breaths in 10 seconds.

Placing an unconscious casualty in a stable side position

- 1 Adjust the upper knee so that the thigh is at a right angle to the hip.
- 2 Place the upper arm across the elbow of the lower arm.



3.4 Placing an unconscious casualty in a stable side position

EAR (mouth-to-mouth resuscitation)

- 1** Kneel beside the casualty.
- 2** Keep the casualty's head tilted back.
- 3** Pinch the casualty's nostrils with your fingers or seal with your cheek.
- 4** Lift the jaw forward and upward with your other hand. Avoid pressure on the neck.
- 5** Take a deep breath and open your mouth wide.
- 6** Place your mouth firmly over the casualty's mouth making an airtight seal.

3.5 a



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EAR (mouth-to-mouth resuscitation)

- 7** Breathe firmly into the casualty's mouth to inflate the lungs.
- 8** Remove your mouth and turn your head to observe the chest fall and to listen or feel for exhaled air.
- 9** If the chest does not rise and fall, check head tilt position first, then check again for foreign objects in the airway. If a foreign object is present, turn the casualty on the side, clear the airway, reposition, and recommence expired air resuscitation.
- 10** Give 5 full breaths in 10 seconds, then check the carotid (neck) pulse for 5 seconds. If pulse is present, continue EAR at the rate of 15 breaths per minute.

b



c



3.5 a-c Mouth-to-mouth resuscitation

C Check for *CIRCULATION*

- feel the pulse at the neck (carotid pulse)
- if pulse is present, continue EAR at the rate of 15 breaths per minute. Check breathing and the pulse after 1 minute, then after every 2 minutes
- if pulse is not present, commence CPR (cardiopulmonary resuscitation)
- check breathing and the pulse after 1 minute, then after every

2 minutes. If the pulse returns, continue EAR. If breathing returns, turn the casualty to a stable side position. Check for and manage shock, bleeding and other injuries

- seek medical aid.

To feel for the pulse

- 1** Place the ends of your fingers in the groove behind the Adam's apple, on either side of the neck, but not on both sides at the same time.
- 2** Do not use your thumb or finger tips.
- 3** The pulse can also be felt at the wrist (radial pulse).



3.6 Feeling for the pulse

CPR for adults – one first aider

- 1 After finding that there is no pulse, kneel beside the casualty with one knee level with the casualty's chest and the other level with the head.
- 2 Your hands must be positioned correctly:
 - locate the lower end of the breastbone by running your fingers along the lowest rib on each side from the outside inwards

3.7 a

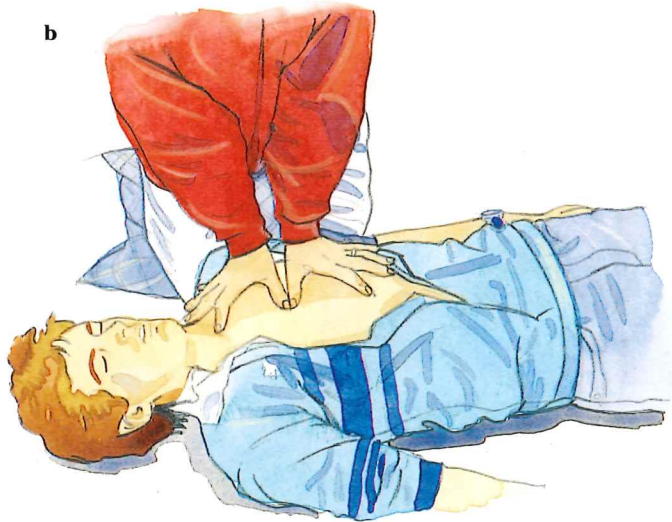


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CPR for adults — one first aider

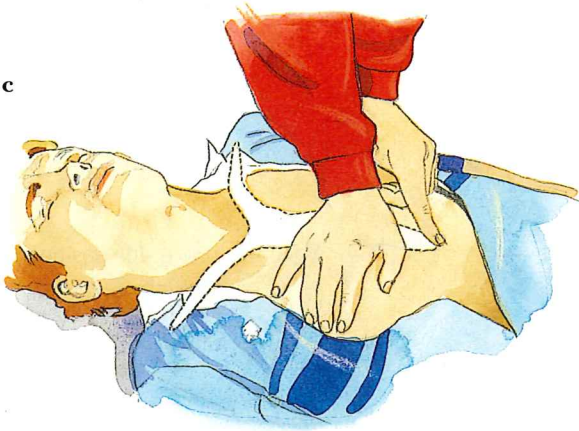
- locate the upper end of the breastbone by placing a finger in the groove between the collarbones
- extend the thumbs of each hand equal distances to meet in the middle
- keep the thumb of one hand in position and place the heel of the other hand below it, on the lower half of the breastbone.



- 3** Your fingers should be relaxed, pointing across the chest, and slightly raised.
- 4** Place your other hand securely on top of the first. Lock the top thumb around the lower wrist, or interlock the fingers.
- 5** Exert pressure through the heel of your lower hand. Your shoulders should be above the breastbone and your compressing arm should be straight. Pivoting from the hips, perform the compressions rhythmically with equal time for compression and relaxation.

- 6 The breastbone should be depressed about 5 centimetres. Release the pressure.
- 7 Give 15 compressions in 10–12 seconds. Then give two breaths in 3–5 seconds. Continue at 4 cycles per minute.

c



d



e



3.7 a-e Positioning the hands for CPR

DRABC summary

DANGER to self, others and the casualty



RESPONSE (shake and shout) → Yes → manage bleeding and other injuries



No → turn casualty on side



AIRWAY — clear and open



BREATHING → Yes → stable side position
manage shock,
control bleeding and
other injuries



No → turn casualty on back
start EAR
5 full breaths in 10 seconds



CIRCULATION — check pulse → Yes → continue EAR 15
breaths/minute
check pulse and
breathing after 1
minute then every 2
minutes



No → commence CPR
60 compressions, 8 breaths/minute
check pulse and breathing after
1 minute then every 2 minutes

CPR for pregnant women: left lateral tilt position

A woman in an advanced state of pregnancy should be positioned on her back with her shoulders flat and padding under her right buttock to tilt her pelvis to the left. If enough padding is not available to achieve a definite tilt, a second person should hold the uterus to the left side while CPR is performed.

When to seek help

If a casualty is not breathing and has no pulse, you should try to give cardiopulmonary resuscitation. However, even if performed expertly, you may not be successful in saving the casualty's life. Success depends on the cause of the injury or illness, how quickly you are able to respond, and how quickly expert medical aid arrives. Seeking help at an early stage is important as early defibrillation offers the best prospect of casualty survival with cardiac arrest.

If on initial assessment of an adult casualty a pulse is found but no breathing, perform EAR. If no pulse is present, perform CPR for 4 cycles and then seek medical assistance before continuing resuscitation.

For children and infants, resuscitation should continue for 5 minutes after assessment and where possible take the child to the telephone to seek medical assistance while continuing resuscitation. Do not leave the child alone at any time!

What next?

After managing life-threatening problems, turn the casualty to a stable side position. Remember that you must call medical aid as soon as possible. You should then undertake an orderly assessment of the casualty, looking for any bleeding, then other injuries such as burns and fractures. Note any tenderness, swelling, wounds or deformity.

Examine the casualty in the following order:

- head and neck
- chest (including shoulders)
- abdomen (including hip bone)
- upper limbs
- lower limbs
- back.

4

More about resuscitation

Expired air resuscitation

Cardiopulmonary resuscitation

**An alternative method for turning
a casualty to a stable side position**

EAR

Mouth-to-nose method

The mouth-to-nose method is used when:

- the jaw and/or teeth are broken
- the jaws are tightly clenched
- resuscitating in deep water
- resuscitating an infant or child when your mouth can cover the casualty's nose and mouth.

Mouth-to-nose method

- 1 Kneel beside the casualty.
- 2 Keep the casualty's head tilted back.
- 3 Close the casualty's mouth and place your thumb on the lower lip to keep the mouth closed. Support the jaw.



4.1 a-c Mouth-to-nose resuscitation

- 4 Take a deep breath and open your mouth wide.
- 5 Seal your mouth around the casualty's nose without compressing the soft part.

b



- 6 Breathe into the casualty's nose.
- 7 Remove your mouth after breathing in. Open the casualty's mouth with your thumb to allow exhalation.

c

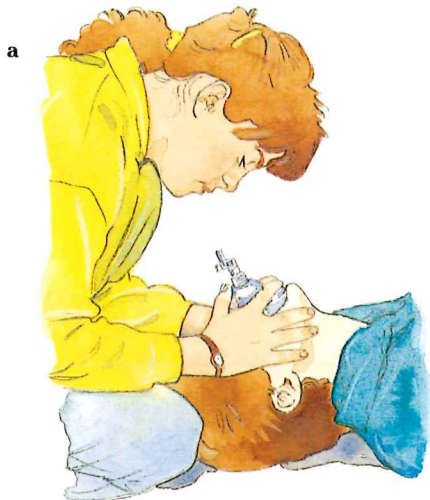


Mouth-to-mask method

The mouth-to-mask method avoids mouth-to-mouth contact between the first aider and the casualty by the use of a resuscitation mask. However, resuscitation should not be delayed by attempts to obtain a mask. An appropriate face mask is provided in the St John Ambulance Australia Communicable Diseases Protection Pack.

Mouth-to-mask method

- 1** Position yourself either beside the casualty's head or at the casualty's head, facing the feet. Use both hands to hold the jaw forward, maintain an open airway and to hold the mask in place.
- 2** Place the narrow end of the mask on the bridge of the nose. Apply the mask firmly to achieve an effective seal.



4.2 a-c Mouth-to-mask resuscitation

- 3** Take a deep breath and blow through the mouthpiece of the mask. Remove your mouth to allow exhalation. Turn your head to listen and feel for the escape of air.
- 4** If the chest does not rise, recheck head tilt, jaw support and mask seal.

b**c**

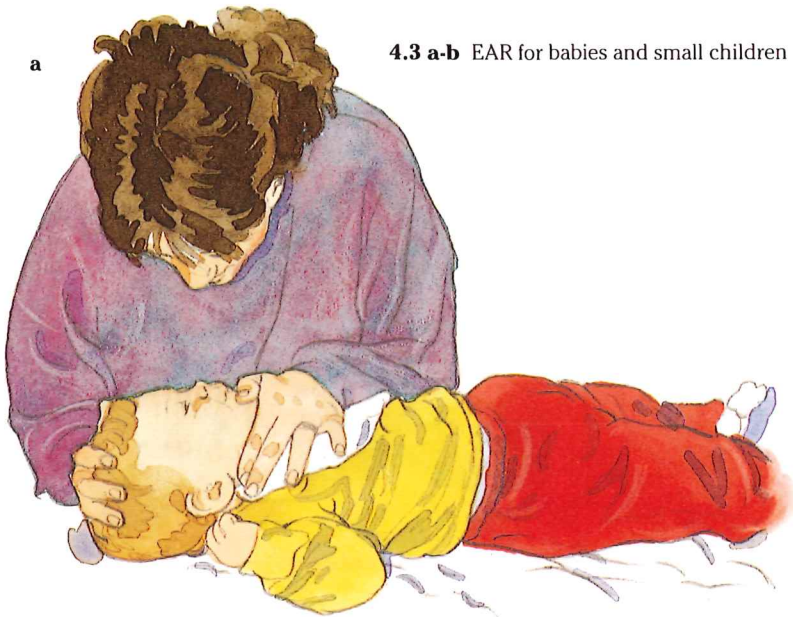
Babies and small children under the age of eight

After clearing the airway, support the jaw without tilting the head backwards. If these manoeuvres do not provide a clear airway, the head may be tilted backwards *very slightly* with a gentle movement. Do not press on the soft tissues under the chin. Cover the mouth and nose with your mouth and puff gently, using just enough pressure to make the casualty's chest rise. Too much pressure may distend the stomach.

Repeat 20 times per minute.

Pulse taking in the infant

Immediately after the delivery of a baby, the heart beat can be felt by placing your fingertips over the baby's left nipple. Subsequently for infants, the brachial pulse is preferred. This is located on the inside of the upper arm, midway between shoulder and elbow.



b



Cardiopulmonary resuscitation

CPR – two first aiders

The most experienced first aider should perform EAR. Kneeling on opposite sides of the body give 5 compressions and 1 breath in 5 seconds. Continue at 12 cycles per minute without pausing between cycles.

CPR – babies and small children under the age of eight

For a baby under the age of 1 year, use two fingers over the lower half of the breastbone, compressing to a depth of 1–2 centimetres. For a small child between the ages of 1 and 8, use the heel of one hand only, to a compression depth of 2–3 centimetres.

With one first aider, give 2 breaths to 15 compressions in 10 seconds (6 cycles per minute).

With two first aiders, give 1 breath to 5 compressions in 3 seconds (20 cycles per minute).



4.4 CPR for babies



4.5 CPR for small children

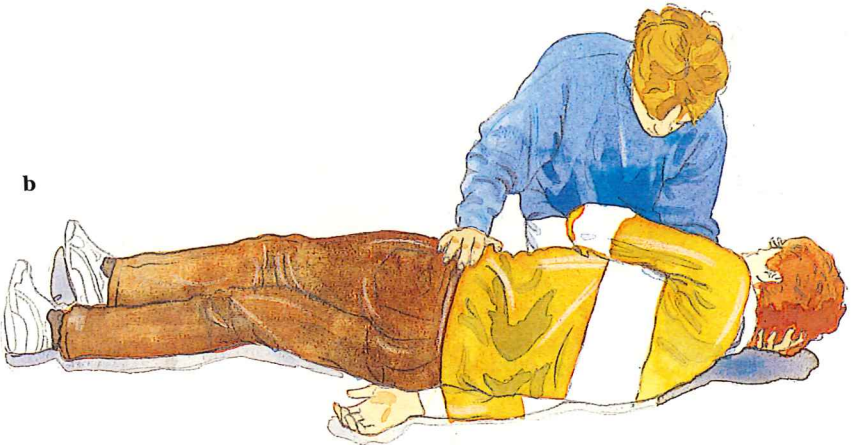
An alternative method for turning a casualty to a stable side position

Kneel beside the casualty and place his nearer arm, palm up, under the buttocks. Cross the farther leg over the nearer leg and place the farther arm across the chest.

4.6 a



b



Support the casualty's head and neck with one hand. With your other hand, grasp the casualty's farther hip and roll the casualty towards you until he rests against your knees. Support the casualty in this position until airway and breathing have been checked.



To ensure a stable side position, remove the farther arm from under the body, place the casualty's hand under the cheek, and bend the upper leg at a right angle to the body.



4.6 a-d Turning a casualty to a stable side position (alternative method)

5

Shock

Shock is the term used to describe a life-threatening condition that can occur as a result of serious injury or illness, particularly when there is pain, severe bleeding, or fluid loss from burns. It is a progressive condition that may lead to the collapse of the circulatory system and death. The circulatory system consists of the heart and blood vessels. Blood is circulated to all parts of the body, supplying food and oxygen, and removing waste products.

Causes

- if blood is lost, as a result of external or internal bleeding, the volume of blood in the blood vessels becomes insufficient
- fluid lost from the tissues as a result of severe burns, diarrhoea or vomiting, is replaced by fluid from the blood, thus reducing the volume of blood
- damage to the heart, e.g. as a result of heart attack
- decreased blood pressure, e.g. as a result of spinal cord injury, severe pain, infection or poisoning.

A combination of these factors may result in more severe shock.

Symptoms and signs

Immediately after injury, there may be little evidence of shock. The symptoms and signs will develop progressively, depending on:

- the severity of the injury
- continuation of fluid loss
- effectiveness of management.

Initial symptoms and signs are:

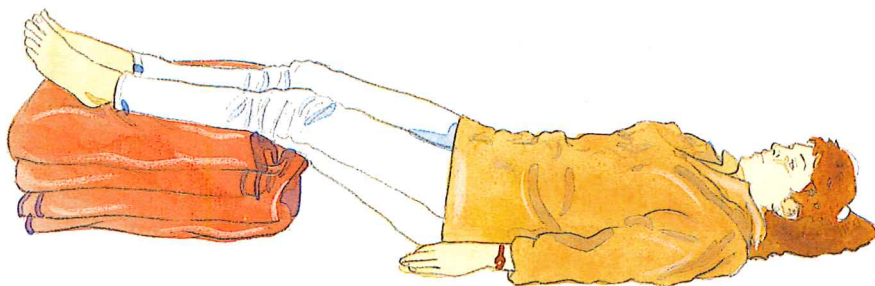
- pale face, fingernails and lips
- cold, clammy skin
- usually a weak, rapid pulse
- rapid breathing
- faintness or dizziness
- nausea.

Symptoms and signs of severe shock are:

- restlessness
- thirst
- extremities become bluish in colour
- the casualty may become drowsy, confused or unconscious
- rapid breathing
- usually an extremely weak, rapid pulse.

Management

- DRABC and control severe bleeding
- reassure the casualty
- seek medical aid urgently
- unless fractured, raise the casualty's legs above the level of the heart



5.1 Managing shock

- dress any wounds or burns
- immobilize any fractures
- loosen any tight clothing
- keep the casualty comfortable by maintaining body warmth but do not heat
- if the casualty complains of thirst, moisten lips, but do not give anything to eat or drink
- monitor and record breathing and pulse at regular intervals. Maintain a clear and open airway

- place casualty in a stable side position if there is breathing difficulty, if vomiting is likely, or if the casualty becomes unconscious.

6

Bleeding

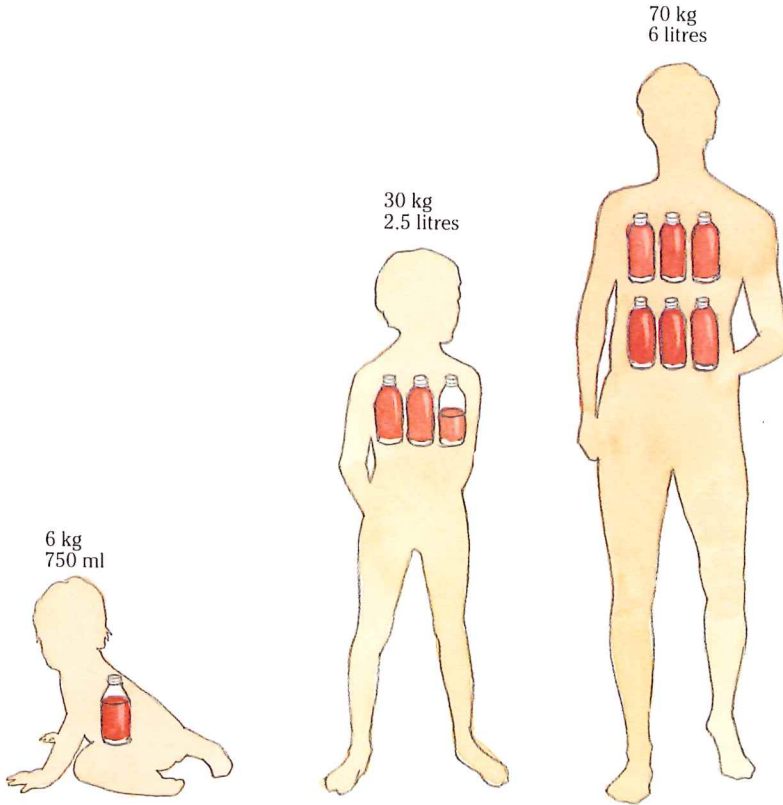
External bleeding

Uncontrolled bleeding

Internal bleeding

Bleeding is a loss of blood from the blood vessels. Severe or continued bleeding may lead to collapse and death. Thus, the first aider must aim to control severe bleeding.

The total quantity of blood in the human body varies according to size. An adult can lose 500 ml of blood without any harm, but the loss of 300 ml might cause death in an infant.



6.1 The quantity of blood in the human body

Remember: severe bleeding is serious. The extent of bleeding may be hidden. **Act quickly!**

External bleeding

Symptoms and signs

- obvious bleeding.

Management

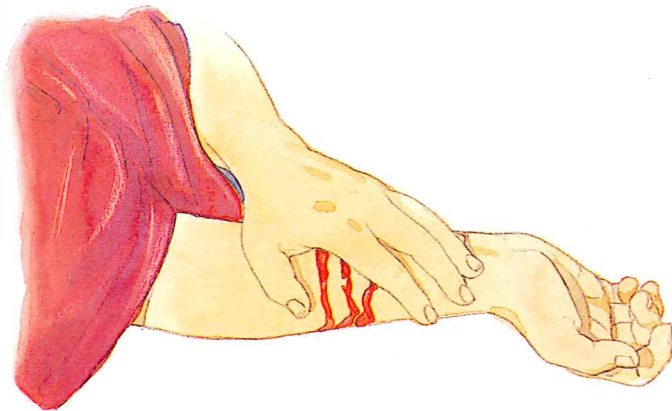
- DRABC
- lay casualty down if bleeding is severe
- apply direct pressure to the wound. Use gloves if available
- raise and rest the injured part when possible
- loosen tight clothing and give nothing by mouth
- seek medical aid urgently if bleeding is severe or persistent.



Direct pressure

- 1 Apply direct pressure to the wound with your fingers or hand. Encourage the casualty to do this (where practical).

6.2 a



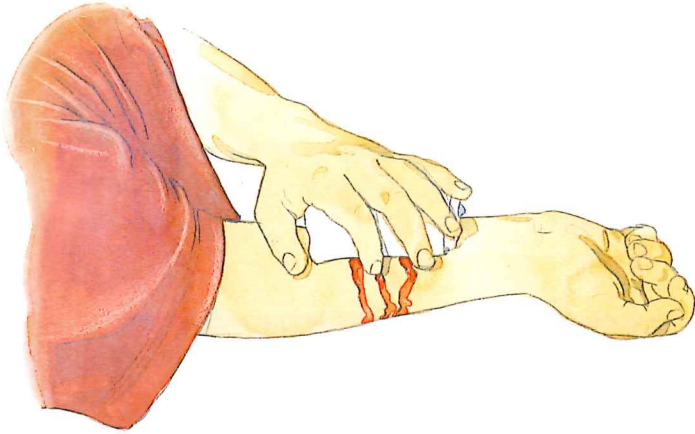
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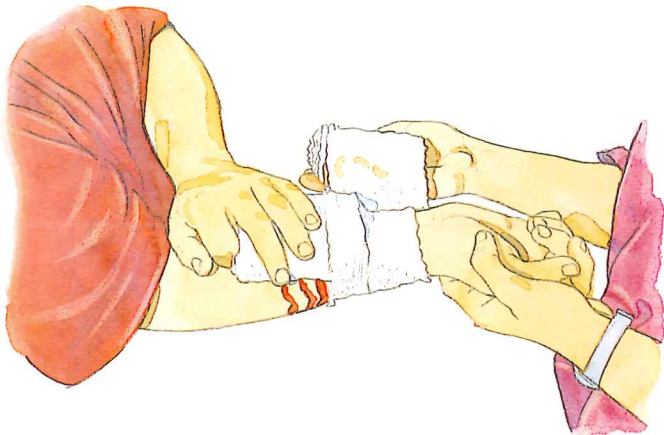
Direct pressure

- 2 As soon as possible, place a clean dressing over the wound. Apply a bulky pad extending beyond the edges of the wound, and firmly bandage. If bleeding continues, leave the dressing in place and relocate the pad.

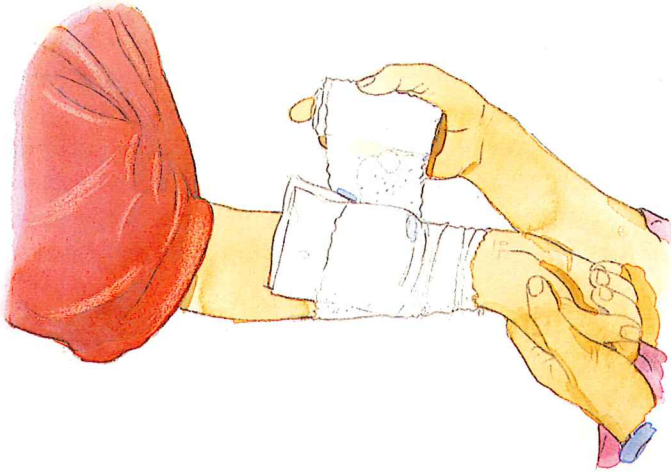
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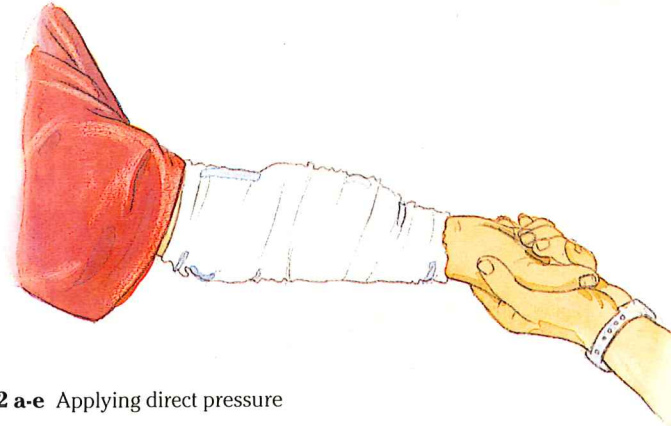
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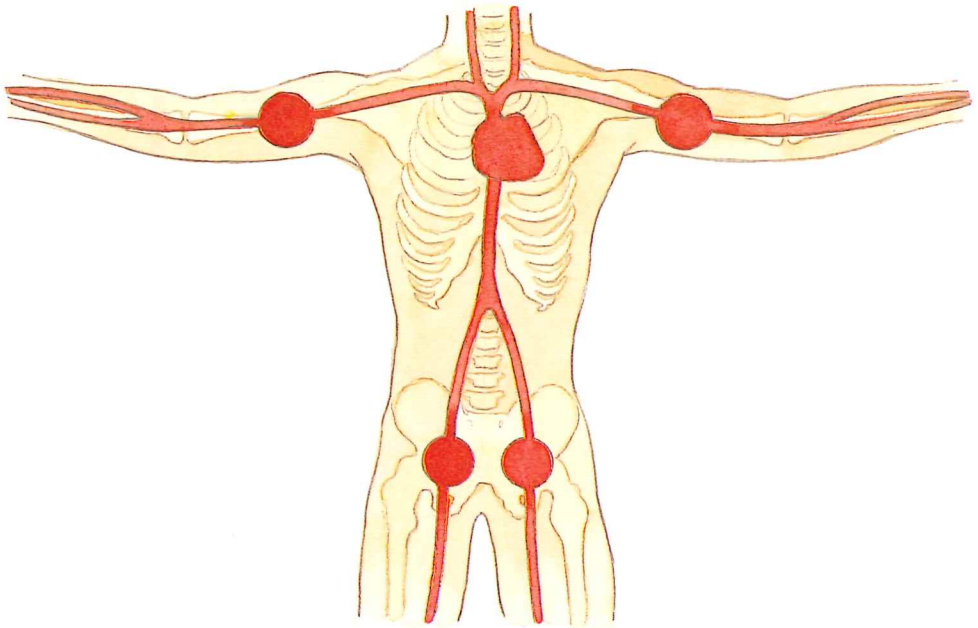
6.2 a-e Applying direct pressure

3 Do not disturb pads or bandages once bleeding is controlled.

Uncontrolled bleeding

If severe bleeding cannot be controlled by direct pressure, it may be necessary to apply pressure to the pressure points. These are found on the main artery above the wound. When bleeding has been controlled, remove pressure to the point and reapply direct pressure to the wound.

Occasionally, in major limb injuries such as partial amputations and shark attack, severe bleeding cannot be controlled by direct pressure. Only then, it may be necessary to resort to the application of a constrictive bandage above the elbow or knee.



6.3 Pressure points

Using a constrictive bandage

- 1** Select a strip of firm cloth, at least 7.5 centimetres (3 inches) wide and about 75 centimetres (30 inches) long. This may be improvised from clothing or a narrow folded triangular bandage.
- 2** Bind the cloth strip firmly around the injured limb above the bleeding point until a pulse can no longer be felt beyond the constrictive bandage and bleeding is controlled. Tie firmly.
- 3** Note the time of application. After 30 minutes, release the bandage and check for bleeding. If there is no bleeding, remove it. If bleeding recommences, apply direct pressure. If this is unsuccessful, reapply the constrictive bandage, and recheck every 30 minutes.
- 4** **Ensure that the bandage is clearly visible and inform medical aid of the location and time of its application.**



6.4 Applying a constrictive bandage

Internal bleeding

Symptoms and signs

Evidence of internal bleeding from some organs may be seen by the first aider. For example:

- coughing up red frothy blood
- vomiting blood the colour of coffee grounds or bright red. The blood may be mixed with food
- passing of faeces with a black, tarry appearance
- passing of faeces which are red in colour
- passing urine which has a red or smoky appearance.

Concealed bleeding within the abdomen may be suspected when there is:

- pain
- tenderness
- rigidity of abdominal muscles.

Internal bleeding will be accompanied by any of the following symptoms and signs:

- faintness or dizziness
- restlessness
- nausea
- thirst
- weak, rapid pulse
- cold, clammy skin
- rapid, gasping breathing
- pallor
- sweating.

Management

- lay the casualty down, or if the casualty is coughing up frothy blood, allow him/her to adopt a position of comfort (normally half sitting)
- raise the legs or bend the knees
- loosen tight clothing
- seek medical aid urgently
- give nothing by mouth
- reassure the casualty.

7

Wounds

Abrasions

Open wounds

Penetrating wounds

Crater wounds

Foreign objects in wounds

Bleeding from the palm of the hand

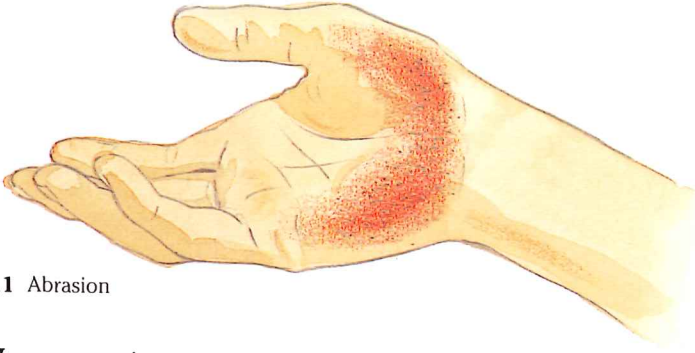
Bleeding from the scalp

Bleeding from varicose veins

Amputated parts

Abrasions

Abrasions, e.g. gravel rash, occur as a result of falls on hard, rough surfaces. Dirt may be embedded in the wound and infection may follow.



7.1 Abrasion

Management

- cleanse the wound thoroughly with sterile gauze soaked in sterile or cool boiled water. An antiseptic may be used according to directions on the label to help wound cleaning
- if this is not possible, wash the wound under running tap water
- gently apply a non-stick dressing.

Open wounds

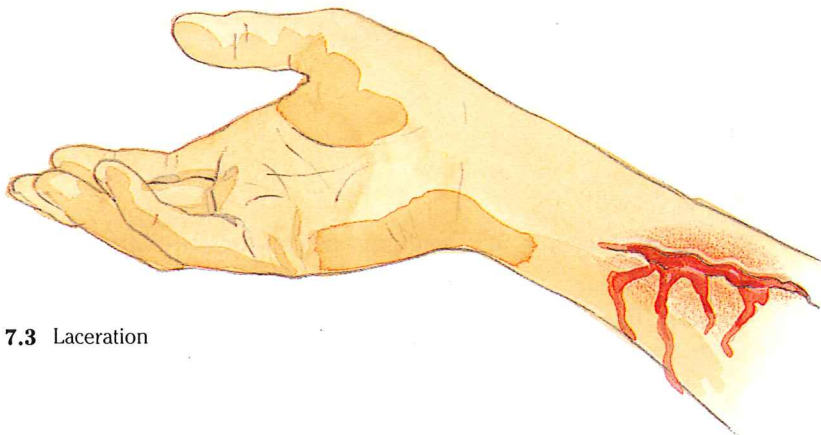
Management



- DRABC
- control bleeding
- clean the wound as well as possible
- apply a sterile or clean dressing
- seek medical aid.



7.2 Incision



7.3 Laceration

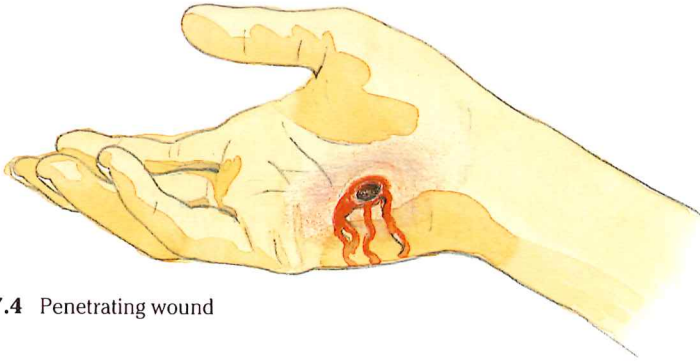
Minimize infection by:

- washing your hands well before and after management
- avoiding coughing, sneezing or talking while managing a wound
- handling the wound only when it is necessary to control severe bleeding
- using sterile or clean dressings.

Dirty and penetrating wounds should be examined by a doctor, as tetanus or other serious and fatal infections may result.

Penetrating wounds

Penetrating wounds are serious and may occur when an object, e.g. a bullet, nail, or needle, penetrates the skin. The penetration may be deep and infection may occur.



7.4 Penetrating wound

Management

- control bleeding by applying direct pressure around the wound
- keep the wound as clean as possible
- cut away or remove clothing covering the wound
- if not bleeding, carefully clean out loose dirt
- do not try to pick out foreign material embedded in the wound
- apply a sterile or clean dressing
- rest the injured part in a comfortable position
- always seek medical aid.

Crater wounds

These occur when large amounts of tissue are suddenly torn from the body. Severe bleeding and shock may result.

Management

- pack wound with sterile or clean material
- apply direct pressure and firmly bandage
- raise and rest the affected part
- seek medical aid urgently.

Foreign objects in wounds

Management

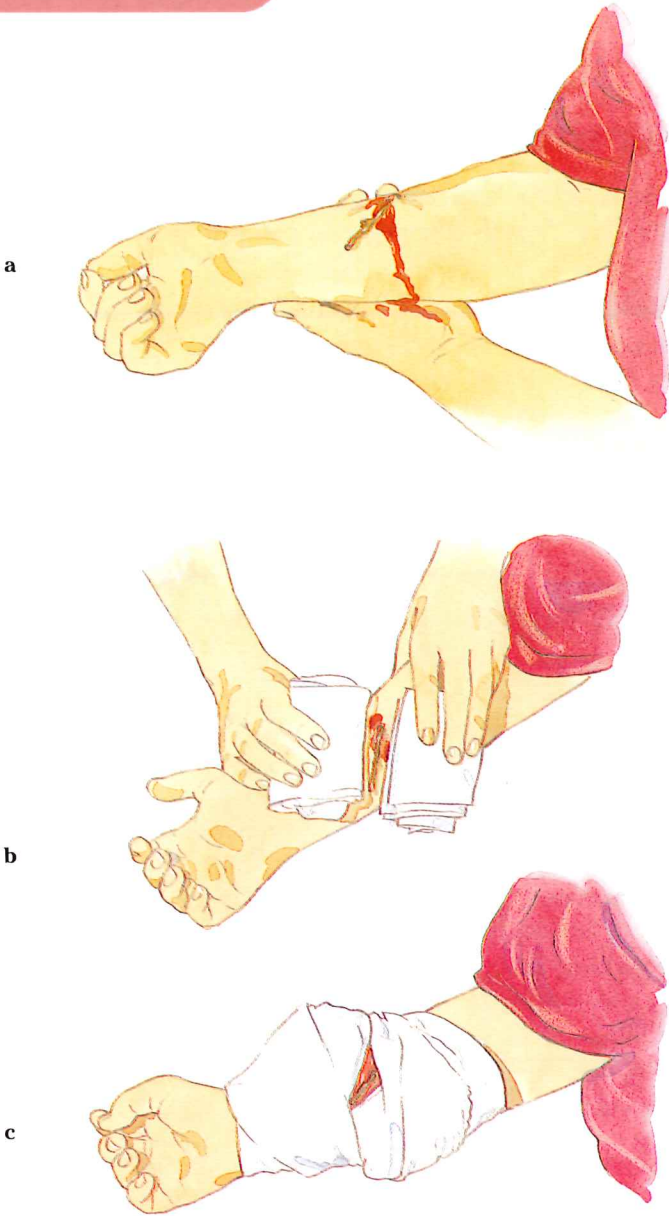
Foreign objects, e.g. gravel, lying on the surface of a wound may be lightly brushed from the wound.

If the foreign object penetrates into tissue:

- do not attempt to remove it as this may result in severe bleeding or may damage deep structures
- control bleeding by applying pressure to the surrounding areas but not on the foreign body
- place padding around the object or place a ring pad over the object and a bandage over the ring pad
- if the length of the object is such that it is protruding outside the ring pad, take care to bandage only each side of the pad
- seek medical aid.

Do not:

- exert any pressure over the object
- try to shorten the object unless its size makes it unmanageable.



7.5 a-c Managing a foreign object in a wound

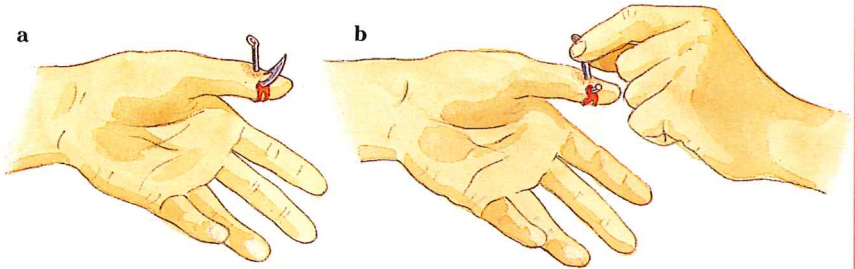
Fish hook wounds

Do not remove fish hooks, but seek medical aid.

If aid is not readily available and the hook is embedded just under the skin, attempt to remove it. Only one attempt should be made. If unsuccessful, manage as for a foreign body in the wound.

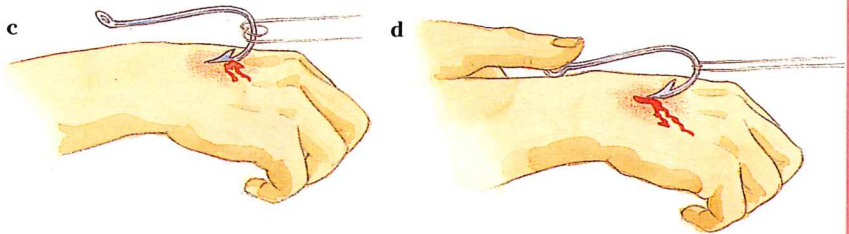
Removing a fish hook

- 1 Push the barb through the skin.
- 2 Cut off the shank of the hook and pull the hook out by the barb, or cut off the barb and pull the hook out by the shank.



- 3 An alternative method is to loop a piece of fishing line around the hook and with your thumb, press the eye of the hook down. Grasp the line firmly and jerk it sharply.

Warning: the hook will fly off in the direction of the tug.



7.6 a-d Removing a fish hook

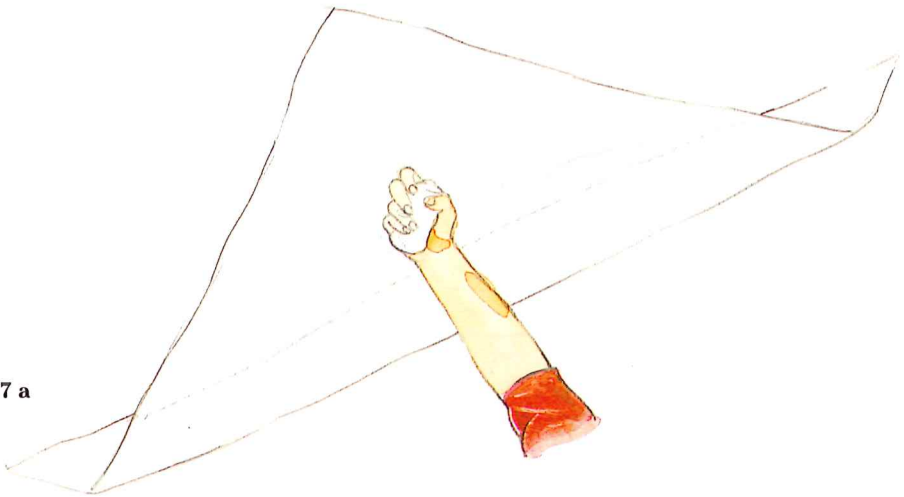
Bleeding from the palm of the hand

Bleeding may be severe as several blood vessels may be involved.

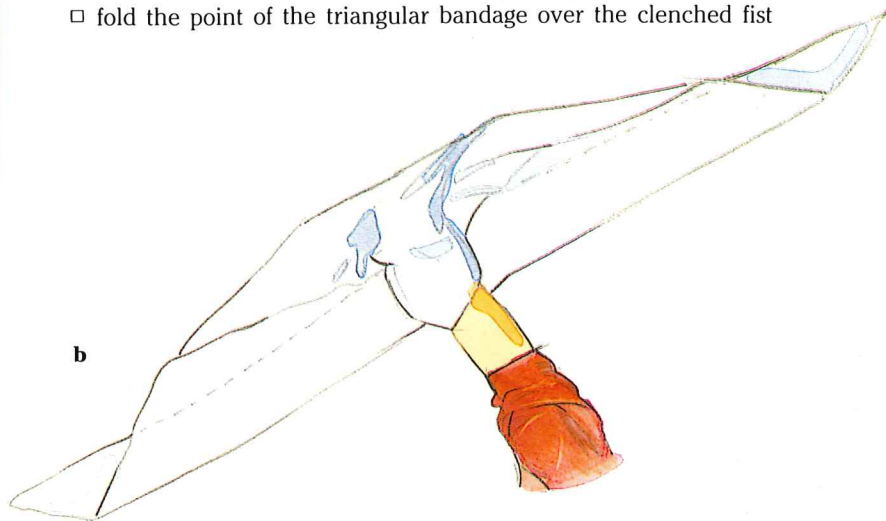
Managing bleeding from the palm of the hand

- 1 Immediately apply firm pressure to the palm of the hand using a pad held in place by the casualty. A firmly folded handkerchief or triangular bandage, an unopened roller bandage, a clean cloth wrapped around an object such as a matchbox, a smooth stone, or two or three fingers of the other hand may be used.
- 2 Elevate the hand above the head.
- 3 Bandage firmly over the hand and fingers with a broad roller or triangular bandage to maintain the pressure. One method of applying this bandage is to:
 - place a bulky pad on the wound and ask the casualty to grasp it firmly
 - place the casualty's hand on an open triangular bandage

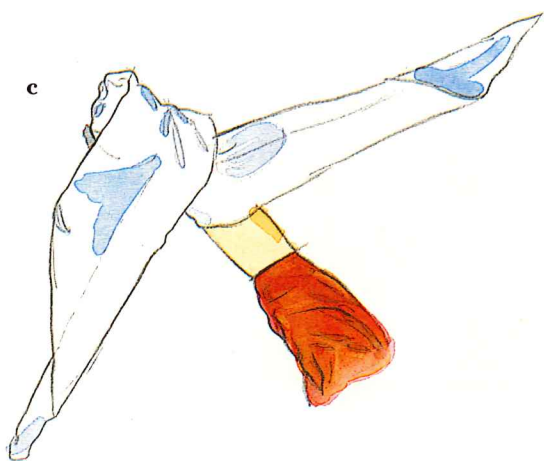
7.7 a



- fold the point of the triangular bandage over the clenched fist



- fold the ends as shown
- elevate the hand in a St John sling.

**CONTINUED**

CONTINUED

Managing bleeding from the palm of the hand

4 Support in a St John sling.

e



7.7 a-e Managing bleeding from the palm of the hand

Bleeding from the scalp

If the casualty's general condition and other injuries permit, sitting up may help reduce bleeding. Direct pressure may need to be maintained as it is difficult to bandage the scalp firmly enough.

Bleeding from varicose veins

Management

- place the casualty flat with the legs raised
- remove any constricting bands from the limb
- apply a clean pad and firmly bandage
- seek medical aid.

Amputated parts

Management

- do not wash or soak the amputated part in water or any other liquid
- wrap the part in gauze or material and place in a water-tight container, such as a sealed plastic bag
- pack the container in crushed ice added to water
- the part should **not** be in direct contact with ice
- send to hospital with the casualty.

8

Burns

General information

Fires

Sunburn

Chemical burns

Electrical burns

Bitumen burns

Causes

Burns may be caused by:

- excessive heat, e.g. fire, steam, hot objects or liquids
- friction, e.g. rope burn
- chemicals, e.g. acids
- electricity, e.g. domestic, high voltage
- radiation, e.g. sun, microwaves, sun lamps.

Effects

Burns may result in:

- death of the superficial layers of the skin or, in severe cases, the whole skin and deeper tissues
- damage to the superficial blood vessels with outpouring of fluid, seen as blisters if the skin is intact
- a raw area, which may lead to infection
- severe pain
- the injured area becoming red, swollen and blistered
- shock.

When to seek medical aid

Extensive burns are dangerous and may be fatal. Seek medical aid if:

- the burn is deep (full thickness) — the skin may look white, or it may be black and charred. The casualty may not feel pain
- a superficial burn (a red, painful area which may blister) is larger than a 20 cent piece
- the burn involves the airway, hands, face or genitals
- you are unsure about how serious the burn is.

Rescue of the burnt casualty

Rescue can be dangerous — leave to expert help, if available.

If entering a burning building:

- feel the temperature of the door. If very hot do not enter. If cold or slightly warm, crouch low and open slowly
- cover mouth and nose with damp cloth

If domestic voltage electricity is involved:

- switch off the current or jerk the cable free
- if this is not possible, remove the casualty from the current using non-conducting, dry materials, e.g. dry clothing or a dry wooden stick
- do not cut the cable.

If high voltage electricity is involved:

- wait until the current is disconnected by the appropriate electricity authority
- ensure you and any bystanders are safe
- do not touch the casualty or any conducting material which is also in contact until the current is disconnected.

Management

- DRABC
- remove the casualty from danger. Do not become another casualty yourself
- put out burning clothing. Smother with a blanket or jacket, or use water
- hold the burnt area under cold, gently running water until the part has returned to normal body temperature (up to 10 minutes)
- remove jewellery and clothing, but leave any that is stuck
- cover the burn with a sterile, non-stick dressing
- seek medical aid urgently

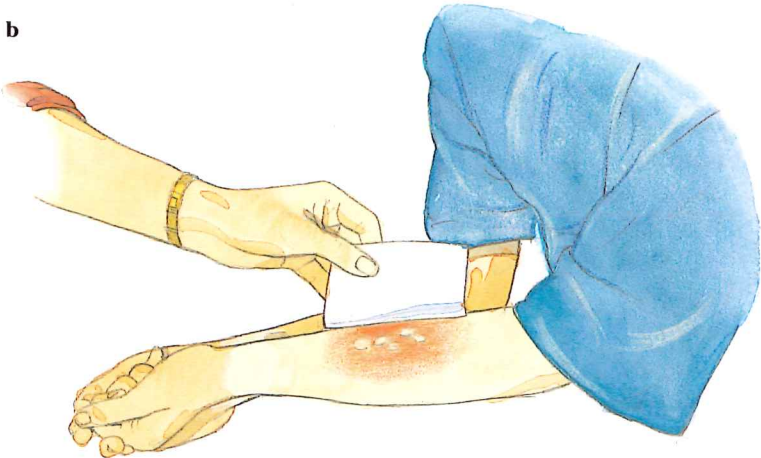


- if the casualty is conscious and thirsty, give frequent small amounts of water. Do not give alcohol
- alleviate extreme pain by gently pouring cold water over the dressing.

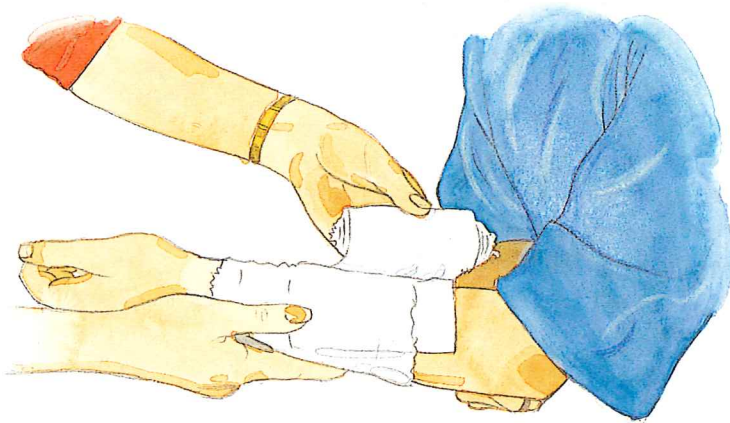
a



b



c



8.1 a-c Managing a burn

Warning

- **Do not** apply any lotions, ointments or oily dressings
 - **Do not** prick or break blisters
 - **Do not** give alcohol to drink
 - **Do not** overcool the casualty, particularly if very young, or if the burnt area is extensive. Overcooling may be indicated by shivering
 - **Do not** use towels, cotton wool, blankets or adhesive dressings directly on the wound.
-

Fires

In a fire, check for and manage:

- asphyxia (lack of oxygen)
- carbon monoxide poisoning
- poisoning from the inhalation of gases given off by plastics and synthetic building materials, e.g. PVC and polyurethane
- burns to the airway
- irritation to the respiratory tract and eyes from smoke and chemical fumes.

Sunburn

Take care to prevent sunburn.

Management

- cold showers
- apply cool moist compresses to the burnt area
- rest in a cool place
- cool drinks
- young babies and casualties with blisters need medical aid.

Chemical burns

Management



- DRABIC
- wash off immediately with a large volume of flowing water for 20 minutes
- remove contaminated clothing and footwear **but avoid contaminating yourself**

- do not attempt to pick off contaminants that stick to the skin
- cover the area with a sterile or clean non-stick dressing
- seek medical aid urgently.

(for cold injuries, e.g. from liquid nitrogen, refer to page 213)

Electrical burns

While the surface skin may show little or no evidence of burning, deep tissues may be seriously burnt.

Management

- DRABC
- remove casualty from danger
- wash and cool burnt area under gently running water well away from live wire
- apply a sterile, non-stick dressing
- seek medical aid urgently for all electrical burns.



Bitumen burns

Management

- **do not attempt to remove bitumen from the skin or from the eyes**
- drench the burnt area immediately with cold, running, water. Use iced water if available
- apply cold wet towels frequently to maintain the cooling effect
- continue the cooling for 30 minutes, but no longer
- if the burn is to the eye, flush the eye with water for 20 minutes and cover both eyes
- seek medical aid urgently.

9

Limb injuries

Bruises

Sprains

Strains

Dislocations

Fractures

Limb injury can involve damage to bones, joints, ligaments, muscles, the major blood vessels and nerves of the limb. Depending on the severity, limb injuries may be life-threatening, or cause considerable pain and long term disability. Blood loss and shock may result, particularly in cases of multiple injury.

Bruises

These may be caused by falls, blows or crushing. Bleeding into the deep tissues occurs, causing bruising.

Symptoms and signs

- pain
- swelling
- bruising
- tenderness.

Management

- RICE.

RICE management

- R** – Rest the casualty and the injured part.
- I** – Ice packs wrapped in cloth may be applied to the injury – 20 minutes on and reapplied every 2 hours for the first 24 hours, then every 4 hours for a further 24 hours.
- C** – Compression bandages, e.g. elastic bandages, should be applied to extend well beyond the injury.
- E** – Elevate the injured part.

Sprains

A sprain occurs when a joint is forced beyond its normal range of movement, stretching or tearing the ligaments that hold it together.

Symptoms and signs

- pain, which may be quite intense and which will also cause restriction of movement and loss of function
- swelling
- bruising, which may develop quickly.

Management

If in doubt, manage as a fracture.

- DRABC
- RICE
- seek medical aid.



Strains

A strain is the result of overstretching of a muscle or tendon.

Symptoms and signs

- pain in the region, usually sharp and with sudden onset
- additional pain on movement, or if the muscle is stretched
- loss of power
- tenderness over the muscle
- sometimes a gap in the muscle.

Management

- DRABC
- apply a cold pack over the injured area
- advise the casualty not to further overstretch the muscle
- support the injured muscle with a compression bandage
- encourage gentle exercise to reduce painful spasm and/or shortening of the muscle
- avoid all rubbing or massage.

Dislocations

A dislocation occurs when force stretches the ligaments so far that the bones in the joint are pushed out of normal contact with each other.

Symptoms and signs

- pain
- inability to move the joint
- deformity
- tenderness over the joint
- rapidly developing swelling and discoloration about the joint.

Management

If in doubt, manage as a fracture.

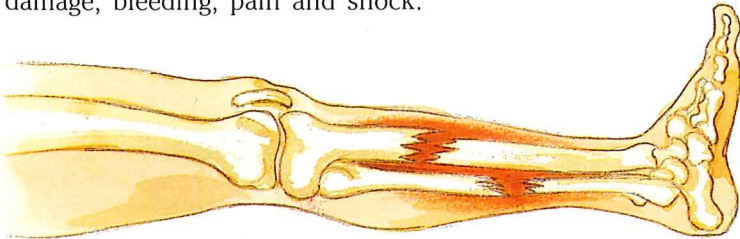


- DRABC
- do not attempt to reduce the dislocation
- if a limb:
 - check the pulse and if absent, gently move the limb to try to restore circulation. Seek medical aid urgently
 - rest the joint in the most comfortable position
 - elevate if possible

- expose the joint and apply cold packs
- use soft padding and bandages to support the joint in the position in which it was found
- for shoulder dislocations, support the shoulder and arm in the position of least discomfort and apply ice packs.

Fractures

A fracture is a broken or cracked bone. The break is usually complete, but in the young the bone can be bent without breaking completely. This is called a greenstick fracture. Correct first aid management of fractures, in both conscious and unconscious casualties, is essential, in order to reduce the amount of tissue damage, bleeding, pain and shock.

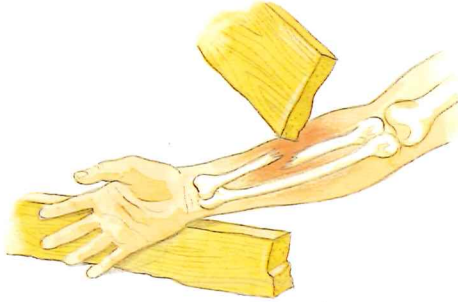


9.1 Fractured bone

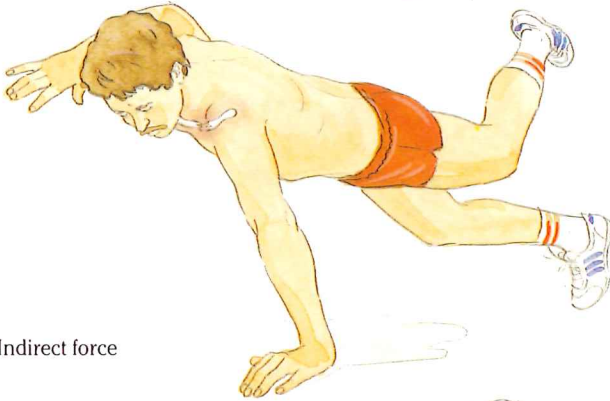
Causes

- direct force — a blow that breaks the bone at the point of impact
- indirect force — when the bone breaks at some distance from the point of impact, e.g. where a fall on an outstretched hand results in a fracture of the collarbone
- abnormal muscular contraction — a sudden contraction of a muscle may result in a fracture, e.g. an elderly person snapping the kneecap after tripping and trying to prevent a fall.

9.2 Direct force



9.3 Indirect force



9.4 Abnormal muscular contraction

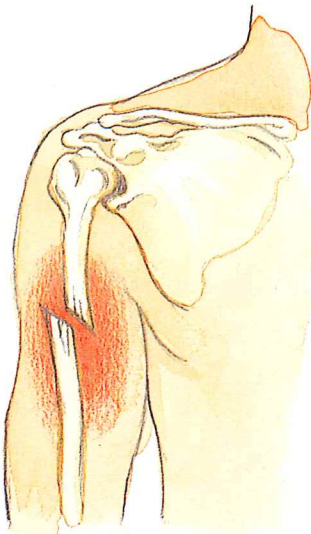


Effects

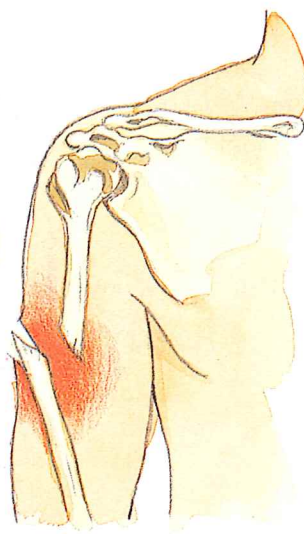
- bleeding — fractures of large bones may result in considerable loss of blood, e.g. a fractured thigh results in the loss of 1 or 2 litres
- damage to surrounding tissues and blood vessels
- pain
- possibly shock.

Types

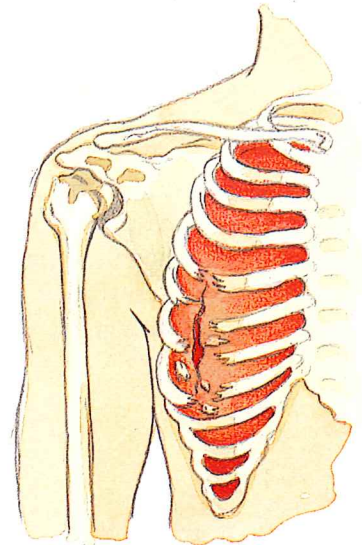
- closed — skin is unbroken and blood is lost into tissues
- open — a wound leads to the fracture, or bone protrudes through the skin. Blood loss may be severe, and infection can result
- complicated — vital organs may be damaged, e.g. rib fracture with an injury to the lung.



9.5 Closed fracture



9.6 Open fracture



9.7 Complicated fracture

Symptoms and signs

- the break may have been felt or heard
- pain at or near the site of the injury
- difficult or impossible normal movement of the limb
- loss of power
- deformity, abnormal twist or shortening of limb
- tenderness when gentle pressure is applied
- swelling over the fracture, and possibly around it
- bruising
- a coarse grating sound if one end of the bone moves against the other. Never actively seek this sign as further injury may result.

Management – general rules

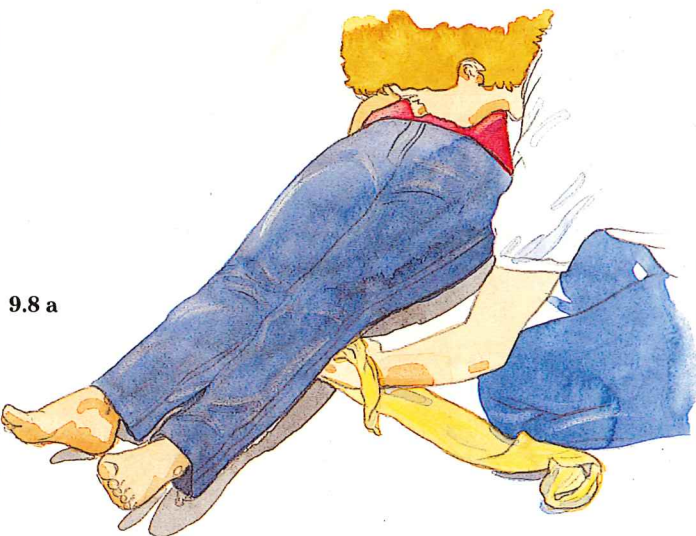


- DRABC
- control bleeding and cover all wounds
- check for fractures — open, closed or complicated
- ask the casualty not to move the injured part
- immobilize fractures with slings, bandages or splints to prevent movement at the joints above and below the fracture
- watch for signs of loss of circulation to the foot or hand
- move the casualty only if there is danger to you or the casualty
- handle gently
- observe casualty carefully and manage shock if necessary
- seek medical aid.

Methods for immobilizing a fracture

Bandages

- 1** Use broad bandages where possible.
- 2** Pass bandages under the natural hollows of the body



- 3** Always support the limb, applying gentle traction until bandages are secured tightly.
- 4** Every 15 minutes, check that bandages are not applied too tightly.
- 5** Check that bandages are not so loose that they will slip or fail to support the fracture.

Splints

- 6** A splint can be any firm material that is long enough to extend beyond the joints at either end of the broken bone.

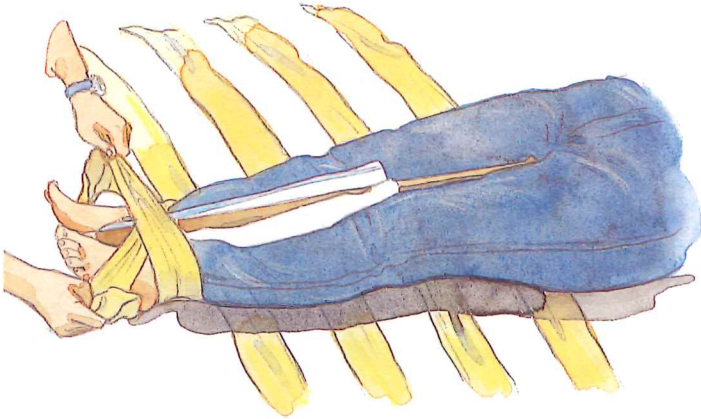
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Methods for immobilizing a fracture

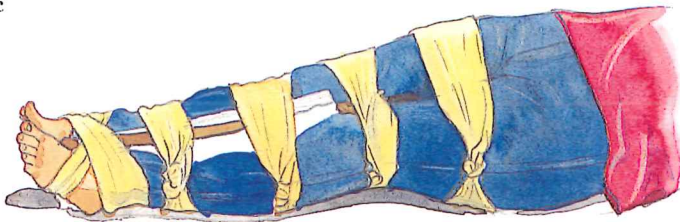
- 7** Padding should be placed between the splint and the natural curves of the limb.

b



- 8** Place bandages at each end of the limb, and just above and below the fracture. Secure the furthest bandage first, then the bandage at the other end of the limb, followed by the bandages above and below the fracture. Non-slip knots, such as a reef knot, should be tied on the uninjured side.

c



9.8 a-c Immobilizing a fracture

Fractured collar bone

Symptoms and signs

- pain, made worse by movement of the shoulder
- history of a fall onto the outstretched arm or elbow
- the casualty may support the arm at the elbow and incline the head towards the injured side
- the shoulder appears to be lower than the uninjured side
- tenderness and swelling around the collarbone.

Management

- DRABC
- follow the general rules for fracture management
- support the arm on the injured side in a St John sling
- seek medical aid.



Fractured upper arm

Symptoms and signs

- pain
- loss of function
- swelling
- the casualty may support the injured arm below the fracture.

Management

- DRABC
- follow general rules for fracture management.

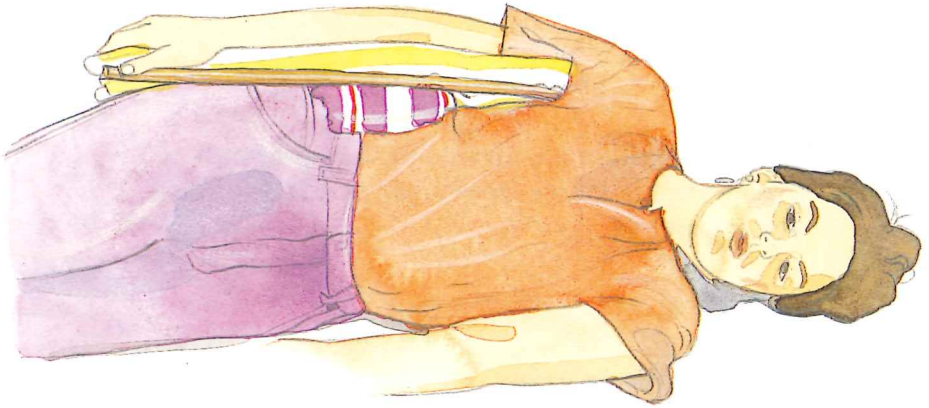
If the injury is close to, or involves the elbow:

- lay the casualty down, supporting the injured area
- check the pulse at the wrist and the colour of the hand and fingers



- gently place the injured limb on supporting material by the side of the body. Do not bend the elbow
- immobilize the arm firmly to the body with broad bandages
- tie bandages in front on the uninjured side
- check the pulse
- seek medical aid.

a



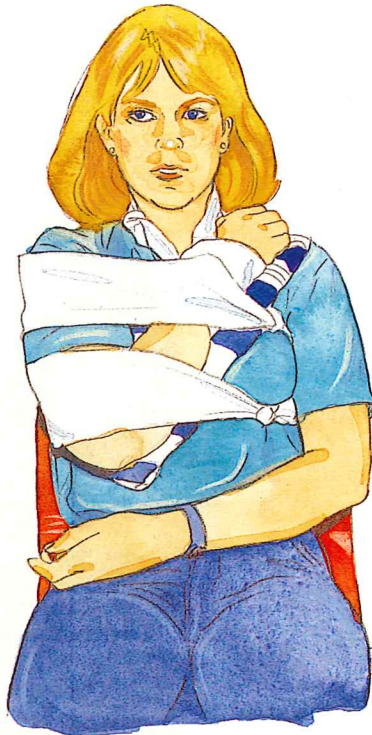
b



9.9 a-b Managing a fractured upper arm (close to elbow)

If the injury is not close to the elbow:

- apply a collar and cuff sling
- do not support under the elbow. Allow the elbow to hang freely
- place soft padding between the elbow area and the chest
- immobilize the arm with two broad bandages (or narrow ones for a small person):
 - one above the fracture, over the arm and around the chest
 - the other below the fracture
- tie off the bandages in front on the uninjured side
- check the pulse
- seek medical aid.



9.10 Managing a fractured upper arm (not close to elbow)

Fractured forearm

Symptoms and signs

- pain
- loss of power
- deformity
- the casualty may support the injured forearm with the other arm.

Management

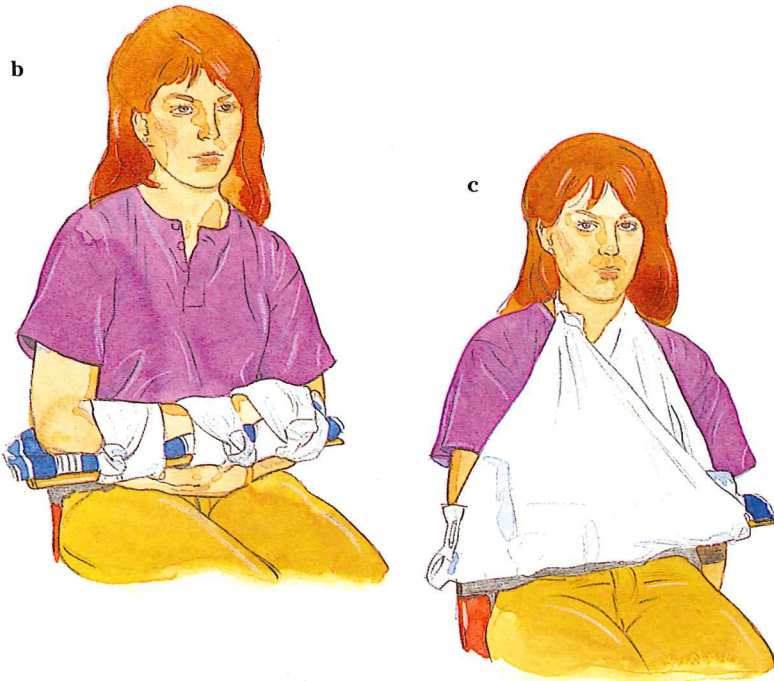


- DRABC
- follow the general rules for fracture management.

If the fracture is **not** near the elbow:

- immobilize the limb firmly to a splint which extends from the elbow to the fingers. Bandage:
 - above the fracture, below the elbow
 - below the fracture
 - at the wrist/hand
- apply an arm sling
- seek medical aid
- check pulse and colour of fingers.





9.11 a-c Managing a fractured forearm

If the fracture is near the elbow:

- immobilize the arm in the position found
- check the pulse
- seek medical aid urgently.

Fractures of the hands and fingers

Symptoms and signs

- pain
- swelling
- deformity
- bleeding, if there is a wound.

Management

Hand fractures



- DRABC
- place soft padding between the chest and the limb
- apply a St John sling
- support the arm with a broad bandage over the forearm, tied off on the uninjured side
- check pulse
- seek medical aid.

Finger or thumb fractures



- DRABC
- rest the injured hand on a well padded splint and secure with a bandage
- elevate the hand for as long as possible
- during transport, support the hand in a St John sling
- seek medical aid.



9.12 Managing a fractured finger or thumb

Fractured wrist

Symptoms and signs

- usually a history of a fall on an outstretched hand
- pain and swelling
- tenderness
- weakness of the hands and fingers
- deformity often present.

Management

- children may prefer to support their own wrist. Allow them to do so
- rest the forearm and hand on a well padded splint. Additional padding under the hand and wrist may be required
- secure the limb to the splint by bandaging below the elbow, across the back of the hand and around the middle of the forearm
- elevate the limb
- apply a large arm sling
- seek medical aid.

Fractured thigh

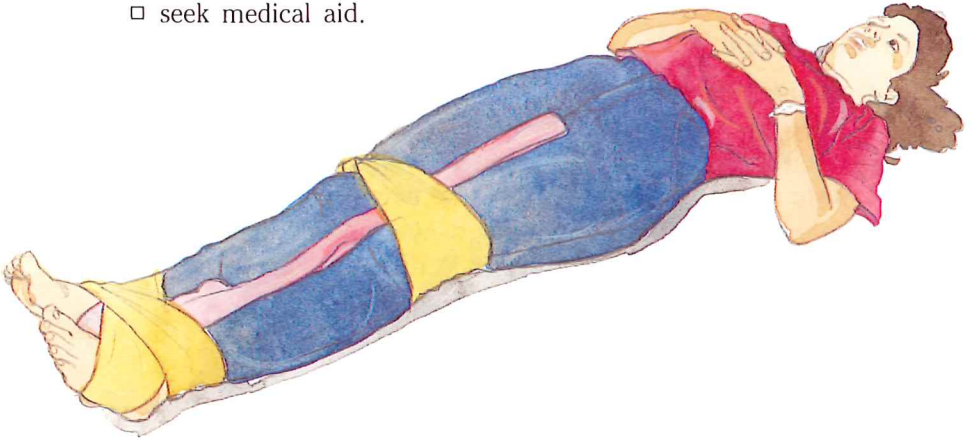
Symptoms and signs

- severe pain at the site of the injury
- loss of power
- tenderness at the site of the injury
- deformity
- swelling
- possibly a rotation of the foot of the injured leg
- possible shortening of the injured leg
- shock.

Management



- DRABC
- cover open wounds
- place padding between legs
- gently bring uninjured limb to the injured limb
- apply a figure-of-eight bandage around the ankles and feet
- apply a broad bandage around the knees and tie on the uninjured side
- seek medical aid.

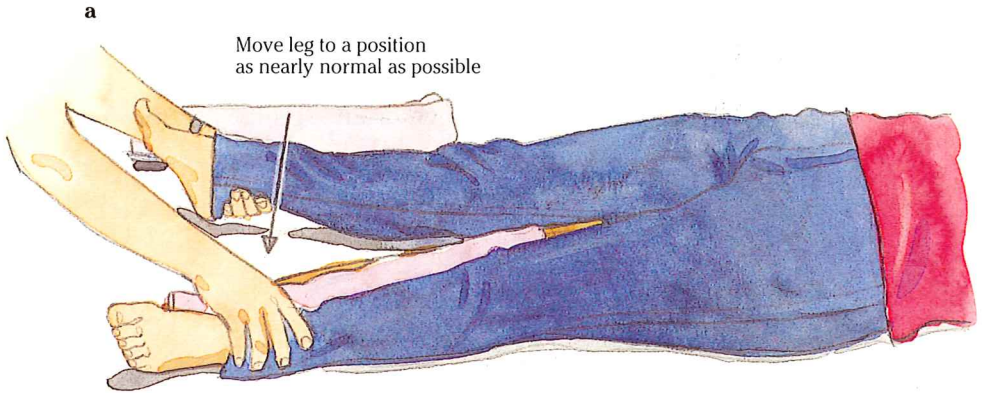


9.13 Managing a fractured thigh

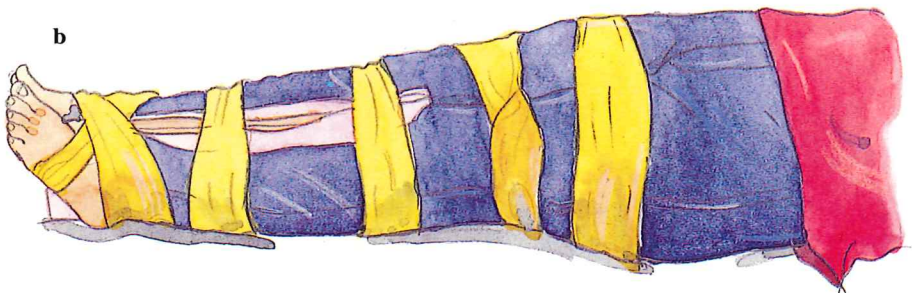
If expert assistance is likely to be delayed:



- DRABC
- cover open wounds
- gently bring uninjured limb to the normal position
- place a well padded splint between the legs
- place one hand under the heel and the other around the toes of the injured limb
- gently draw down to apply traction to the foot, while rotating the leg to a position as nearly normal as possible against the splint



- apply a narrow figure-of-eight bandage around the ankles and feet
- pass bandages under:
 - the thighs above the fracture
 - the thighs below the fracture
 - both knees
 - between the knees and the ankles
- tie on the uninjured side
- check the circulation of both limbs (note the colour and temperature of the skin and feet).



9.14 a-b Managing a fractured thigh if expert assistance is delayed

Fractured neck of the thigh bone

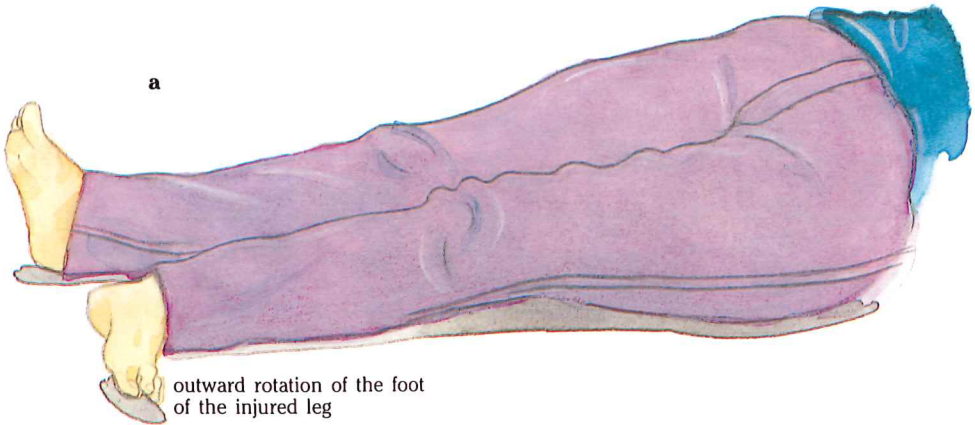
Symptoms and signs

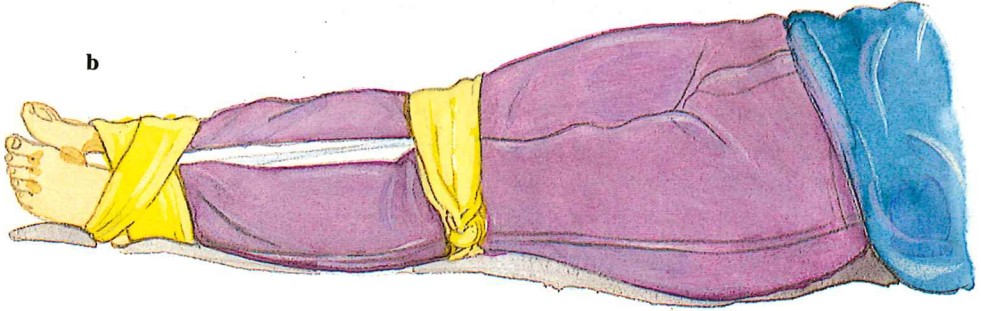
- pain in the area of the hip, thigh or knee, and when moving the limb
- loss of power
- tenderness over the hip
- outward rotation of the foot of the injured leg
- shortening of the injured leg
- bruising (seen later).

Management

DRABC

- DRABC
- if the casualty has been lying on the ground for a long period of time, manage any scalds to the skin from urine and faeces
- reassure the casualty
- make casualty comfortable
- place padding between legs and under tender spots
- apply a figure-of-eight bandage at the ankles and a broad bandage at the knees
- seek medical aid.





9.15 a-b Managing a fractured neck of the thigh bone

Fractured kneecap

Symptoms and signs

- pain over the kneecap, aggravated by movement
- loss of power at the knee
- inability to straighten the leg
- tenderness and swelling over the kneecap
- sometimes a gap can be felt at the front of the knee
- sometimes the displaced kneecap can be felt.

Management

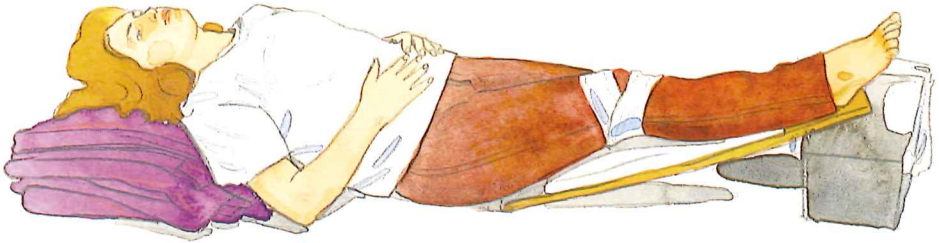
- DRABC
- lay the casualty on the back with head and shoulders raised
- raise the leg about 30 centimetres and support it in the most comfortable position
- do not attempt to straighten the knee
- if the limb can be splinted without increasing discomfort, then
 - apply a pressure bandage around the knee (figure-of-eight crepe or conforming bandage)
 - apply a splint along the back of the limb from buttock to beyond the heel



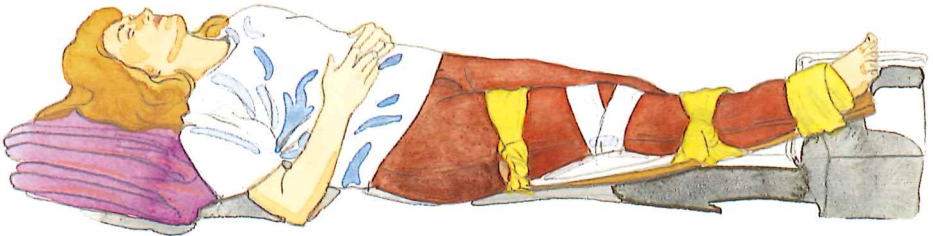
- ensure that the splint is adequately padded, particularly under the natural hollows of the knee and ankle
- secure the limb to the splint by a figure-of-eight bandage around the ankle and foot, broad bandage around the thigh, and broad bandage around the lower leg

- support and elevate the leg
- seek medical aid.

a



b



9.16 a-b Managing a fractured kneecap

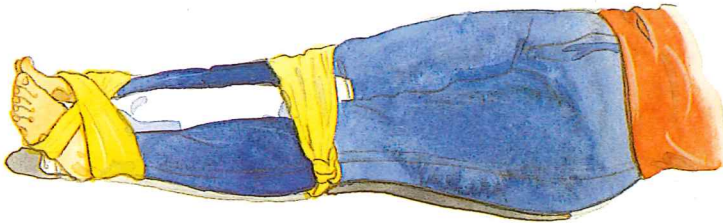
Fractured lower leg

Symptoms and signs

- pain
- inability to walk
- shortening of injured leg
- deformity
- swelling
- rotation of foot of injured leg
- protruding bone
- bleeding.

Management

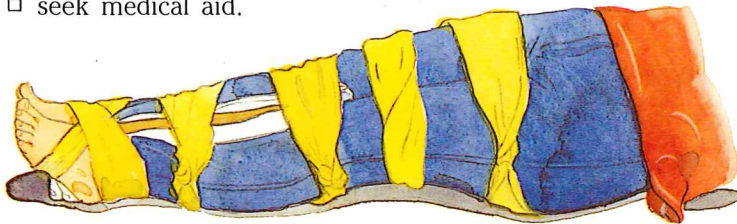
- DRABC
- control bleeding and cover wounds
- place padding between the legs
- bring the uninjured limb to the injured limb
- steady and support the injured limb
- apply a figure-of-eight bandage around the ankles and feet
- apply a broad bandage around the knees, and tie on the uninjured side.



9.17 Managing a fractured lower leg

If expert assistance is delayed:

- DRABC
- control bleeding and cover wounds
- place a well padded splint between the legs, from the thighs to the ankles
- pad between the thighs, knees and ankles
- apply a figure-of-eight bandage around the ankles and feet
- apply a broad bandage around the thighs, at the knees, above and below the fracture
- seek medical aid.



9.18 Managing a fractured lower leg if expert assistance is delayed

Fractured feet and toes

Symptoms and signs

- pain
- inability to walk
- tenderness
- swelling.

Management



- DRABC
- only remove shoes and socks if there is an open wound
- if casualty is not wearing shoes, apply a compression bandage
- raise foot and rest on pillow
- seek medical aid.

Fractured ankle

This fracture may be mistaken for a sprain, particularly if no deformity is present.

Symptoms and signs

- history of a twisting injury
- pain and swelling on either or both sides of the ankle
- inability to bear weight on the ankle
- tenderness, particularly over the bony prominences on either side of the ankle
- deformity, which may be severe.

Management

If no deformity is present:

- RICE
- avoid any weight bearing on the affected limb
- seek medical aid.

If deformity is present:

- steady and support the injured limb on pillows or a folded blanket
- do not apply any compression bandages around the ankle
- seek medical aid urgently.

10

Head, neck and spinal injuries

Head injuries

Spinal injuries

Head injuries

Head injuries involve damage to the brain or the structures of the skull surrounding the brain. No head injury should be disregarded or treated lightly. Every casualty who has had even a mild head injury must be observed thoroughly to detect any complications. The casualty who has been unconscious for even a moment must always be advised to seek medical aid.

Special precautions

A casualty who, having recovered consciousness, lapses again into an unconscious state, is in serious and immediate danger. All casualties who are unconscious as a result of a head injury must be presumed to have suffered a spinal injury.

Causes

These include:

- car and motor cycle accidents
- a blow to the head
- a fall in which the head is struck
- landing heavily on the feet
- diving into shallow water
- contact sports.

Prevention

Wear protective head gear when:

- working on a building site
- horse riding
- motor cycle riding
- playing cricket
- cycling
- playing rugby football.

Symptoms and signs

In assessing someone for damage to the brain or a fracture to the skull, look for the following symptoms and signs:

- history of injury
- loss of memory (particularly of the event)
- headache
- blurred vision
- altered or abnormal responses to commands and touch
- wounds to the scalp or to the face
- blood or clear fluid escaping from the nose or ears
- pupils becoming unequal in size.

Management

- DRABC
- manage as if unconscious
 - turn to a stable side position
 - clear and open airway
 - monitor breathing and circulation
- remember the possibility of a spinal injury: support the head and neck during movement
- if the face is badly injured, keep the airway open with your fingers. Do not force the jaw open if clenched
- control bleeding but **do not apply direct pressure** to the skull if you suspect a fracture
- if blood or fluid comes from the ear, secure a sterile dressing **lightly** in place. If possible lay the casualty on the injured side
- if there is an eye injury lightly cover both eyes with a sterile pad
- seek medical aid urgently.



Concussion

Concussion is an altered state of consciousness, often only brief, following a blow to the head.

Symptoms and signs

- history of injury
- loss of consciousness (unable to recall events).

Management

- as for head injury.

Compression

This occurs when blood escaping from a broken blood vessel accumulates and compresses part of the brain.

Symptoms and signs

- deteriorating level of consciousness
- noisy and/or rapid breathing
- convulsions
- unequal and unreactive pupils
- weakness on one side.

Management

- as for head injury
- seek medical aid urgently.

Fractured base of the skull

Symptoms and signs

- bleeding or clear fluid from one or both ears
- blood in the white of the eye.

Management

- as for head injury
- support the head and neck when turning the casualty on the

- side, preferably injured side down
- do not try to close the casualty's mouth
 - seek medical aid.

Spinal injuries

Spinal injuries should always be regarded as serious and requiring careful management. If the casualty is not correctly handled, paralysis can result.

If you are the first person at the scene of an accident, careful assessment and management of the casualty will play an important part in minimizing permanent disability and hence, in increasing the casualty's recovery potential.

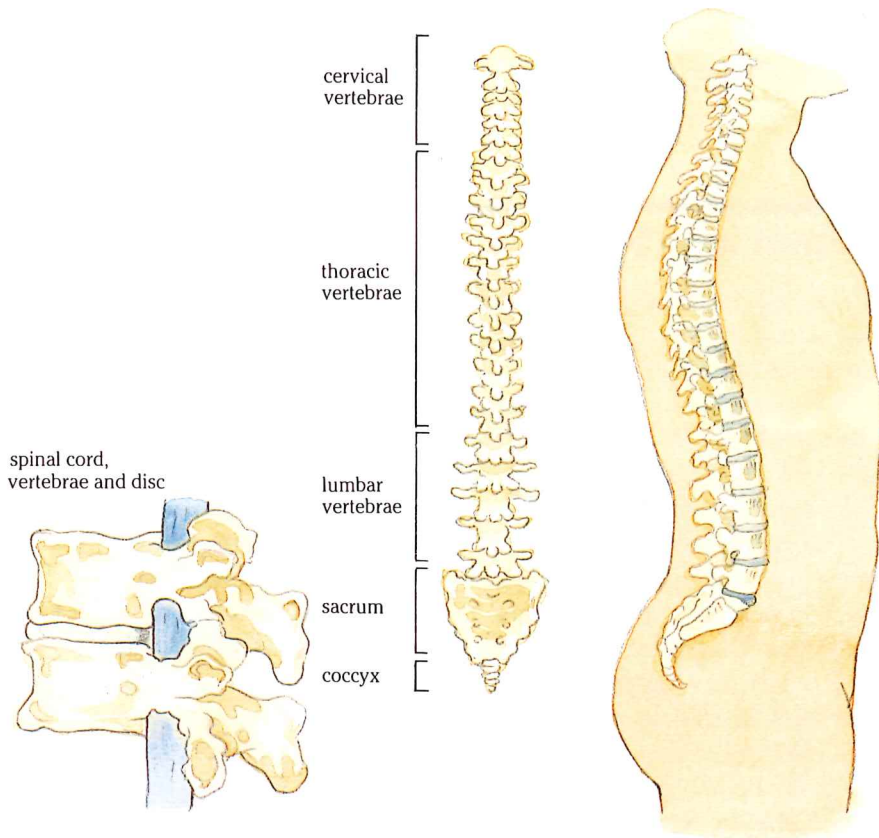
The spinal column consists of 33 bones (vertebrae) which support the body. Discs separating the vertebrae allow movement and act as shock absorbers. The vertebral column encloses a canal which houses the spinal cord, an extension of the brain. It is a complex bundle of nerve cells and fibres transmitting messages for movement and sensation to and from the brain.

If the cord is damaged, communication between the brain and the body below the injury fails, causing loss of power and sensation. Lesser injury may result in partial paralysis or altered sensation. This is usually permanent because spinal nerve cells do not recover. Death may result if vital groups of cells controlling breathing and circulation are damaged.

Displaced or ruptured discs, or bone fragments that pinch the spinal cord, may cause temporary damage.

Twisting, compressing or bending an injured spinal column may:

- worsen damage caused by the injury
- damage the cord, even if it was not damaged initially.



10.1 The spine

Causes

- motor vehicle and motor cycle accidents
- diving and watersport activities
- sporting accidents
- industrial accidents
- gunshot and knife wounds
- falls
- heavy blows to the back
- landing heavily on buttocks.

Prevention

- wear a seatbelt when driving
- wear a helmet on motor-cycles, bicycles, skateboards and construction sites
- check the water depth before diving or waterskiing
- play by the rules in sport.

Symptoms and signs

- pain at or below the site of the injury
- absent or altered sensation, e.g. tingling in the hands or feet
- loss of movement or impaired movement below the site of the injury
- tenderness over the injury site

If the casualty is unconscious as a result of a head injury, suspect a spinal injury.

Management

If the casualty is unconscious and/or suspected of having a spinal injury:

- DRABC
- maintain a clear and open airway
- if possible, before turning the casualty on the side, apply a cervical or improvised collar to minimize movement of the neck in any direction.



If the casualty is conscious:

- reassure
- loosen tight clothing
- do **not** move the casualty unless essential because of danger
- unless circumstances make it necessary, leave lifting, loading and transportation to a qualified person, such as an ambulance officer
- support the head and neck by placing your hands on either side of the casualty's head until other support can be

arranged. This is especially important if the casualty is found in a sitting position, as when trapped in a motor car

- apply a cervical collar if available, or improvise by using a folded towel, newspaper or other bulky dressing around the neck
- seek medical aid urgently.



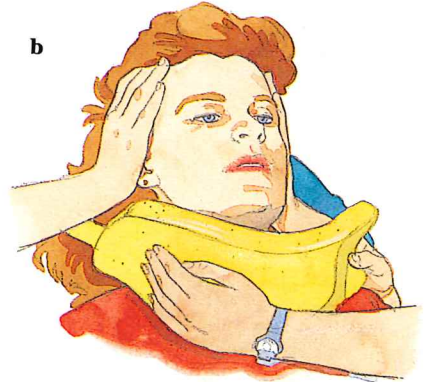
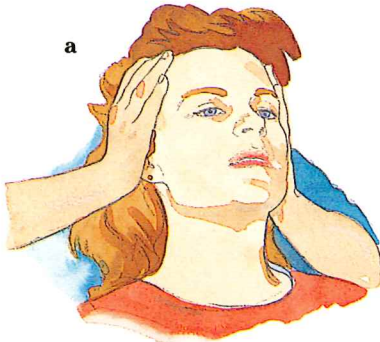
10.2 a-c Managing a conscious casualty with a spinal injury

When a diving accident has occurred:

- use a flotation aid or surf board, if handy, to support the casualty before removing from the water
- leave the casualty on the board until medical aid arrives.

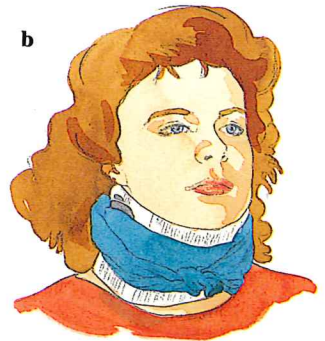
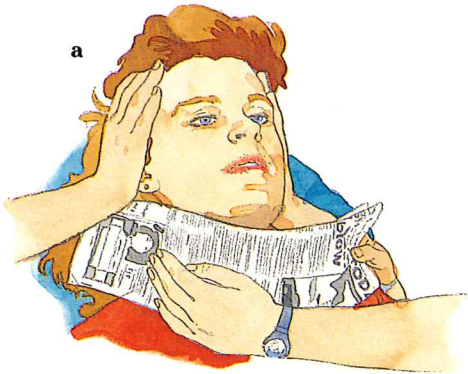
Cervical collars

1 Apply a cervical collar to minimize movement of the neck in any direction



10.3 a-b Applying a cervical collar

2 Applying an improvised cervical collar — a folded towel, newspaper or other bulky dressing can be used.



10.4 a-b Improvising a cervical collar

11

Facial injuries

The eye

The ear

The nose

The jaw

The teeth

Facial injuries can potentially result in severe disability, including the loss of the senses of sight, hearing or smell. The first aider must aim to protect the eyes, ears and nose of all casualties, particularly the unconscious.

The eye

The eye is very susceptible to infection. Always wash your hands carefully before managing a casualty with an eye injury. Most eye injury management requires both eyes to be covered. Remember that this may cause the casualty to become disoriented.

Foreign objects in the eye

These may include:

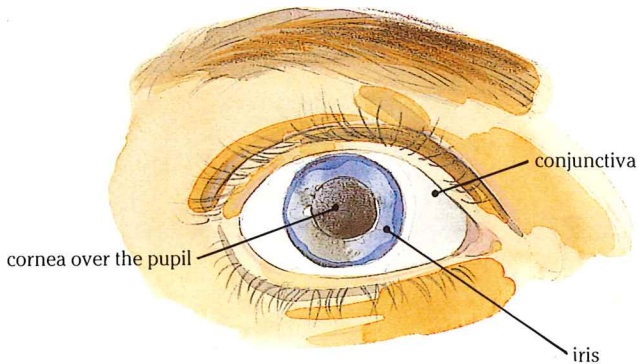
- loose eyelashes
- insects
- grit or dust
- glass
- cosmetics
- metal particles.

Symptoms and signs

- pain in the eye, particularly when looking at light
- gritty feeling in the eye
- watering of the eye
- redness of the eye
- inability to open the eye
- spasm or twitching of the eyelid.

Warning:

- the casualty should avoid rubbing the eye
- never try to remove a foreign object from the coloured part of the eye
- never try to remove any object that is embedded in the eye
- do not persist in examining the eye if the injury is severe.



11.1 The eye

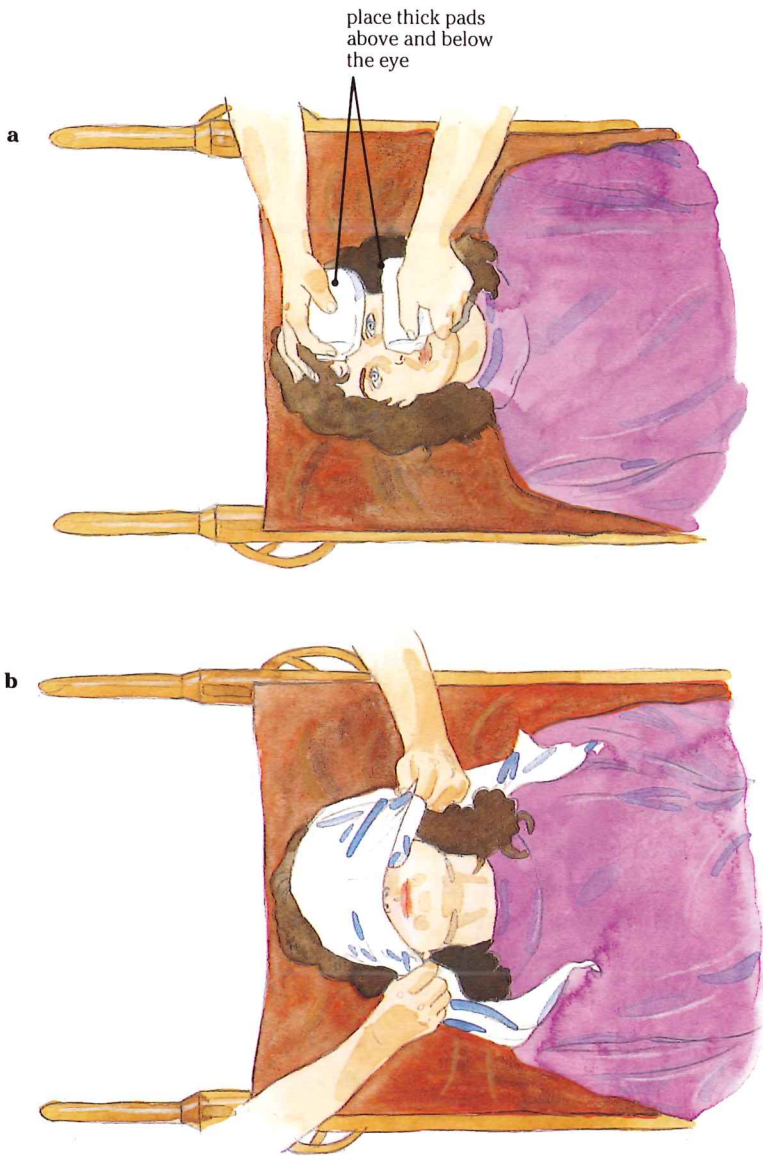
Management

If a foreign object is embedded in the eye:

- if available, lay the casualty on a stretcher
- cover both eyes, ensuring that the pad does not press on the injured eye, by placing thick pads on the bony part of the eye socket above and below the eye. See illustrations overleaf.

If the foreign object is small and loose:

- it may be washed out by tears
- if not, try to remove the object as described overleaf.
- if unsuccessful, refer to medical aid.



11.2 a-b Managing a foreign object embedded in the eye

Removing a small, loose foreign object from the eye

- 1** Ask the casualty to look up. Gently draw the lower lid down and out. If the foreign object is visible, remove it, using the corner of a clean cloth, moistened in water.
- 2** If the foreign object is not visible, ask the casualty to look down. Gently grasp the lashes of the upper lid. Pull the lid down and over the lower lid. This may dislodge the foreign object.
- 3** If the latter method is unsuccessful, wash the eye with a gentle stream of clean water or sterile saline.



11.3 Removing a small loose foreign object from the eye

Burns to the eye

Causes

- chemicals, e.g. acids, caustic soda, lime
- heat, e.g. flames or radiant heat
- welding flash or ultraviolet light.

Symptoms and signs

- pain
- intolerance of light
- severe watering of the eyes
- reddening of the eyeball
- swollen eyelids
- in the case of welding flash, a gritty feeling and pain, which may not be felt until several hours after exposure.

Warning: in the case of chemical burns, immediate action is necessary.

Management

If a chemical or heat burn:



- DRABC
- open the eyelids gently with your fingers
- wash the eye with cold flowing water for at least 20 minutes, ensuring that you wash under the eyelids
- place eye pads or light clean dressings over both eyes
- seek medical aid promptly.

If a welding flash or ultraviolet light burn:

- place eye pads or light clean dressings over both eyes
- seek medical aid.

Smoke in the eyes*Symptoms and signs*

- pain
- watering
- reddening
- the casualty may close the eyes tightly.

Management

- DRABC
- ask the casualty not to rub the eyes
- wash the eyes with cold tap water or sterile saline if available.
The remainder of the solution will need to be discarded after use.



Wounds to the eyes

Causes

- direct blows
- fast moving objects, e.g. a squash ball.

Warning: do not persist in examining the eye if the injury is severe.

Management

- reassure the casualty
- lay the casualty on the back
- place a light dressing over both eyes, ensuring there is no pressure on the injured eye
- ask the casualty not to move the eyes
- arrange immediate ambulance transport to medical aid.

Contact lenses

If the casualty is wearing contact lenses and they can be easily removed, ask him to remove them before the eye injury is managed. Do not remove them yourself.

The ear

Bleeding from the ear

This may indicate a fractured base of the skull or other serious injury.

Causes

- a blow to the head
- a fall.

Management



- DRABC
- **do not** plug the ear canal
- **do not** administer drops of any kind
- allow fluid to drain freely
- place the casualty on the side with the affected ear downwards, even if the casualty is conscious
- place a sterile pad between the ear and the ground
- seek medical aid urgently.



11.4 Managing bleeding from the ear

Ruptured ear drum

The ear drum is a fine membrane stretched across the channel between the outer and middle ears. It is an essential link in the chain that transmits sound to the brain. If the ear drum is ruptured the casualty has diminished hearing in that ear.

Causes

- explosions
- SCUBA diving
- pressure changes when flying
- a blow to the ear
- a foreign object in the ear
- infection.

Symptoms and signs

- pain, usually severe
- absent or diminished hearing through the affected ear
- blood or fluid escaping from the ear.

Management

- reassure the casualty
- manage as for bleeding from the ears
- seek medical aid.

Foreign objects in the ear

Small objects can become lodged in the ear, e.g.

- pins
- matchsticks
- beads
- small insects
- grass seeds.

Warning:

- do not probe the ear, but gently inspect the ear to identify the object and how deeply it is placed
- do not attempt to remove, unless a small insect.

Management

- seek medical aid.

If a small insect:

- place one droplet of vegetable oil, warmed to body temperature, in the ear. If vegetable oil is not available, use a little warm water
- if the insect does not float out, seek medical aid.



11.5 Removing a small insect from the ear

The nose

Foreign objects in the nose

These may include:

- peas
- beads
- marbles
- cotton
- seeds
- crayons.

Management

- if a small object, block the opposite nostril and ask the casualty to blow it out of the nose
- tell the casualty to breathe through the mouth
- seek medical aid.

Bleeding from the nose

Causes

- a blow to the nose
- excessive blowing of the nose.

Management

- ask the casualty **not** to blow the nose, and to breathe through the mouth
- sit the casualty up with the head slightly forward
- have the casualty apply finger and thumb pressure on the soft part of the nostrils for at least 10 minutes
- loosen all tight clothing around the neck, chest and waist
- keep the casualty cool with a supply of fresh air
- place cold wet towels on the neck and forehead
- if bleeding continues, reapply finger and thumb pressure for 10 minutes. If bleeding persists, seek medical aid.



11.6 Managing bleeding from the nose

Broken nose

Symptoms and signs

- history of injury
- pain
- swelling
- bruising
- bleeding from the nostril.

Management

- seek medical aid urgently
- if bleeding, manage as for bleeding from the nose. There is no requirement for pressure unless bleeding is severe.

The jaw

Fractured jaw

Symptoms and signs

- pain
- inability to chew
- tenderness
- swelling
- deformity
- misalignment of jaw and teeth
- drooling of saliva.

Management

- DRABC
- if unconscious, turn on the side. If conscious, and other injuries permit, allow the casualty to sit in the position of greatest comfort (usually sitting up and leaning forward)
- support the jaw with your hand, or pull the lower jaw forward to keep the airway clear and open. The casualty may be able to support his/her own jaw if conscious
- seek medical aid.



Dislocated jaw

Symptoms and signs

- inability to close the mouth
- pain in front of the ear
- tenderness
- drooling of saliva.



Management

- DRABIC
- remove any dentures
- support the lower jaw
- seek medical aid.

The teeth

Bleeding from a tooth socket

This may follow:

- a tooth extraction
- a blow to the mouth, in which a tooth is dislodged.

Management

- instruct the casualty to keep the tongue clear of the socket
- do not attempt to remove the clot in the socket by rinsing
- place a firm pad of gauze over the socket and instruct the casualty to bite firmly onto it
- if the bleeding continues, seek medical or dental aid.

Tooth injuries

Management

If a tooth is knocked out:

- save the tooth
- clean the tooth, by having the casualty suck it or by washing in saliva or milk. Do not handle the root of the tooth
- if possible, replace the tooth in the mouth in its original position

- hold in place for 2 minutes, then mould a piece of aluminium foil or milk bottle cap over it and two neighbouring teeth on each side. This acts as a temporary splint
- have the casualty bite firmly onto this splint for added stability
- if it is not possible to replace the tooth, store it in saliva or milk until dental attention is available
- if the tooth has been in contact with soil or dirt advise the casualty to have an anti-tetanus injection if not currently immunized
- advise the casualty to see a dentist as soon as possible.

If a tooth is loosened:

- straighten the tooth
- splint with foil as described above
- advise the casualty to see a dentist as soon as possible.

12

Chest injuries

Fractured ribs

Flail chest

Penetrating chest wound

Chest injuries range from a simple bruising of the chest with slight pain or discomfort on breathing, to life-threatening injury to the vital organs, and can seriously affect breathing and circulation.

Types of injury

- fractured ribs
- flail chest
- bruising of the lung
- penetrating chest wound
- lung injury, e.g. bleeding, collapse of the lung, leaking of air and/or blood in the chest space.

Causes

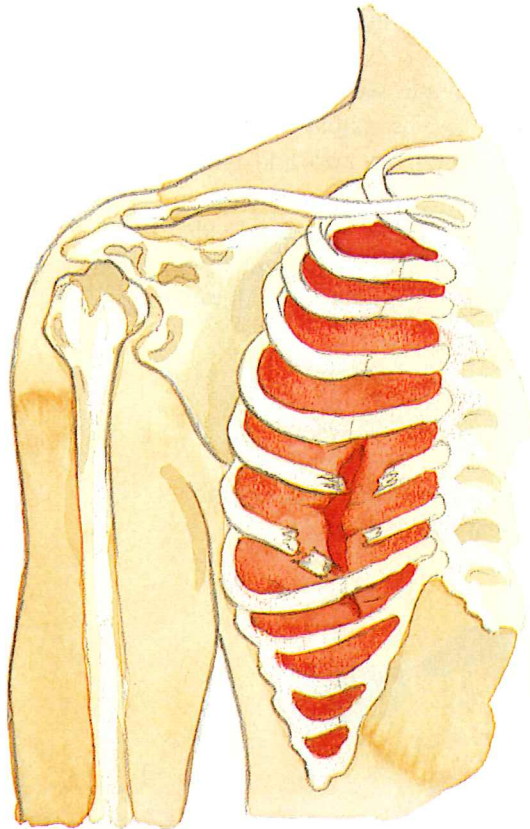
- blows, e.g. steering wheel impact
- falls
- crushing by heavy objects
- stabbing
- gunshots
- blasts.

Fractured ribs

The fracture may be closed, or ribs may be forced into, and damage the lungs. As a result, blood and air may collect in the chest space.

Symptoms and signs

- pain, worsening as the casualty breathes and coughs
- breathing difficulty. The casualty may support the injured side of the chest with his arm or hand



12.1 Fractured rib

- breathing may be short, rapid and gasping
- tenderness at the site of the injury
- frothy, bloodstained sputum.

Management

If the casualty is conscious:

- place the casualty in a comfortable position, normally half sitting and leaning to the injured side, if other injuries permit

- encourage the casualty to breathe with short breaths using the diaphragm
- gently place ample padding over the injured area
- apply one or two broad bandages according to the size of the casualty, securing the arm and padding to the chest on the injured side
- tie off in front on the uninjured side
- if bandages increase discomfort, loosen or remove them
- immobilize the arm using a St John sling or collar and cuff sling
- seek medical aid urgently.

If the casualty is unconscious:

DRABC

- DRABC
- lay the casualty on the injured side
- seek medical aid urgently.

a



b



c



12.2 a-c Managing a fractured rib

Flail chest

This occurs when several ribs are broken in more than one place, in such a way that part of the rib cage becomes loose.

The loose part does not move with the rest of the rib cage when the casualty breathes. Instead it moves in the opposite direction. This is called **paradoxical breathing**.

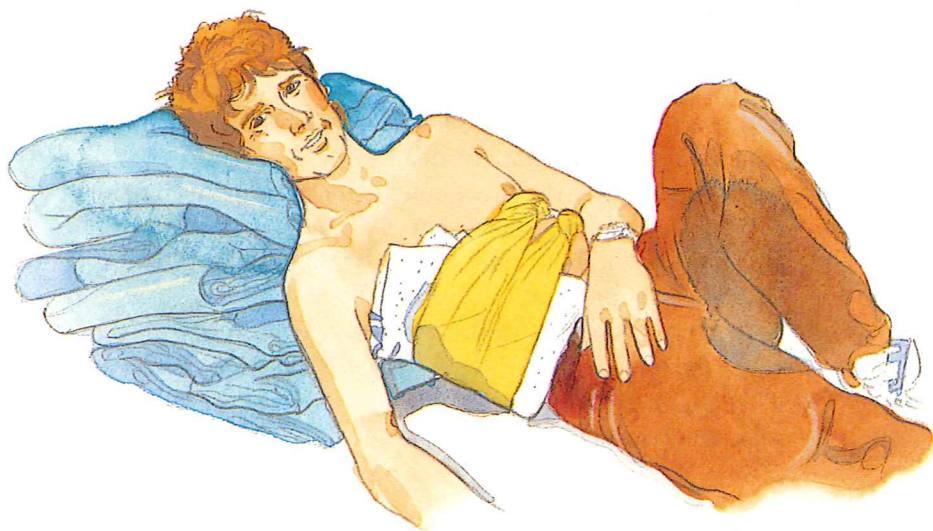
Symptoms and signs

- shortness of breath (gasping for air)
- chest pain
- breathing difficulty
- blue lips
- difficulty in speaking
- loose part moving in a direction opposite to that of normal breathing
- unconsciousness.

Management



- DRABC
- clear and open airway
- if the casualty is conscious, place in a comfortable position, normally half-sitting, leaning to the injured side. If unconscious, turn to the injured side
- loosen tight clothing
- place a large bulky dressing over the loose area with a firm bandage
- bend the arm on the injured side at the elbow and with fingers pointing to the opposite shoulder, securely bandage to the chest
- seek medical aid urgently.



12.3 Managing a flail chest

Penetrating chest wound

This may result in air being sucked into and out of the chest cavity. The lung may collapse and blood may accumulate between it and the chest wall.

Symptoms and signs

- pain at the site of the injury
- breathing difficulty (shortness of breath)
- a wound, or blood on clothing
- sucking noise in the wound
- unconsciousness.

Management



- DRABC
- if the casualty is conscious, place in a comfortable position, normally half-sitting, leaning to the injured side. If unconscious, turn to the injured side
- place your hand over the wound until an airtight dressing, e.g. plastic sheet, plastic bag or aluminium foil, is available
- tape the top and both sides of the dressing in place. **Do not** tape the bottom edge
- if an airtight dressing and adhesive tape are not available, cover the wound with a clean or sterile dressing. Remove it if breathing becomes more difficult
- seek medical aid.

13

Abdominal and pelvic injuries

Injuries of the abdomen

Injuries of the pelvis

Injury to the abdomen requires prompt medical attention. If the spleen, liver or pancreas is injured, profuse internal bleeding may result. Injury to the bowel may result in the spilling of contents into the abdominal cavity, causing inflammation. Shock is often a complication of abdominal and pelvic injuries.

Causes

- motor vehicle accidents
- sports injuries
- blunt objects
- crushing by a heavy weight
- sharp instruments
- heavy falls
- swallowed foreign bodies.

Injuries of the abdomen

Symptoms and signs

- pain
- nausea and/or vomiting
- pallor
- grunting breathing
- evidence of the injury, e.g. bruising, wound tenderness
- resistance of abdominal muscles to light pressure
- blood in the urine if the bladder is injured
- blood escaping from the anus or genitals if these have been involved
- protrusion of intestines through a penetrating abdominal wound
- development of shock.

Management

- DRABC
- loosen clothing
- place the casualty on the back with the head and shoulders slightly raised and with a blanket placed under the knees



13.1 Managing an abdominal injury

- give nothing to eat or drink. If the casualty is thirsty, moisten the lips
- cover protruding intestines with a large non-stick sterile dressing, aluminium foil or plastic food wrap, preferably soaked in sterile saline, or clean water if this is not available
- seek medical aid urgently.

Swallowed foreign object

Management

- give nothing to eat or drink
- seek medical aid.

Emergencies of the abdomen

Many diseases of the abdominal organs need emergency management, e.g. appendicitis.

Symptoms and signs

- pain in the abdomen or lower back
- nausea and/or vomiting
- tenderness in the abdomen
- rapid breathing and pulse
- rigidity of abdominal muscles
- possibly, high temperature
- possibly, swelling of the abdomen
- shock.

Management



- DRABC
- loosen clothing
- position the casualty as for an abdominal injury
- give nothing to eat or drink, but if the casualty is thirsty, moisten the lips
- seek medical aid urgently.

Injuries of the pelvis

Causes

- motor vehicle accidents, and in particular, those involving pedestrians
- crush injury
- fracture of the pelvis, resulting in injuries to the organs located in the pelvic area.

Symptoms and signs

- pain in the region of the hips or groin, increasing with movement
- inability to stand
- tenderness
- bruising in the groin or scrotum
- shock.

Management

- DRABC
- if conscious, place the casualty flat on the back with the knees slightly bent and supported by a folded blanket

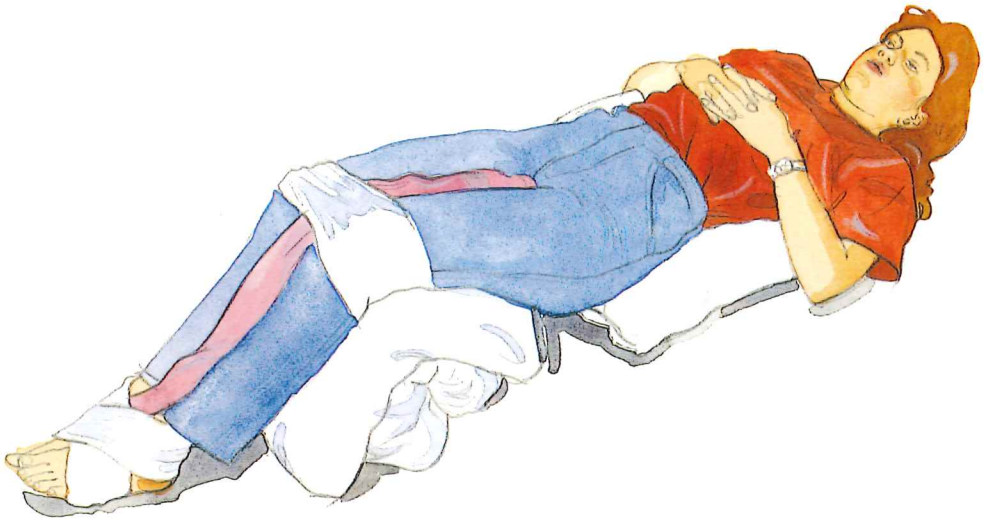


13.2 Managing a pelvic injury

- immobilize on a stretcher or firm support
- remove the pocket contents
- instruct the casualty not to pass urine (there may be a strong desire to do so)
- seek medical aid urgently
- reassure the casualty.

If medical aid will be delayed, or you need to move the casualty

- 1 Place soft padding between the knees, legs and ankles.
- 2 Apply a narrow figure of eight bandage around feet and ankles.
- 3 Apply a broad bandage around the knees.
- 4 Support the pelvis on either side with rolled up blankets.



13.3 Managing a pelvic injury if medical aid is delayed

Emergencies of the pelvic organs

Causes

- retention of urine
- emergencies of the female reproductive organs
- injury of the male reproductive organs.

Retention of urine

Symptoms and signs

- pain in front of the pelvis
- extreme desire to pass urine
- swelling in the lower abdomen.

Management

- lay the casualty on the back with legs raised and a blanket or pillow under the knees
- seek medical aid urgently.

Emergencies of the female reproductive organs

Symptoms and signs

- resistance of abdominal muscles to light pressure
- pain in the lower abdomen and groin
- bleeding from the vagina
- tenderness in the lower abdomen
- shock.

Management

- lay the casualty on the back with legs raised
- seek medical aid urgently.

Injury of the male reproductive organs

Symptoms and signs

- pain
- nausea and/or vomiting
- 'doubling up' with guarding of the injured area
- swelling

- bruising
- tenderness.

Management



- DRABC
- rest and reassure casualty
- lay the casualty on the back with knees slightly bent and supported by a folded blanket, or in a position of comfort
- cooling of the injured area with wet cloths or ice packs may minimize bruising
- seek medical aid.

14

Care of the acutely ill

Disorders of breathing

Disorders of consciousness

**Disorders of the heart and
circulation**

Disorders of breathing

Asthma

Asthma is a breathing problem resulting from sudden or progressive narrowing of the airways. Attacks can be caused by:

- exercise
- allergies, e.g. pollens
- cold air
- some drinks
- preservatives
- respiratory infections
- anxiety or emotional stress
- house dust
- food additives
- stress
- smoke.

Symptoms and signs

- casualty may be sitting up
- moderate to severe breathing difficulty
- sometimes wheezing
- sometimes coughing
- possibly paleness, sweating, blueness of lips, ear lobes and fingertips
- may be very quiet or subdued
- possibly unconsciousness.

Management



- DRABC
- if the casualty is conscious, assist him/her into the most comfortable position, usually sitting upright

- reassure the casualty
- assist with prompt administration of an inhaled bronchodilator – that is a puffer, containing salbutamol or terbutaline or related drug. Give 4 puffs to children and adults with mild asthma and 6–8 puffs to adults with severe asthma. Bronchodilators are best administered through a spacer, if available. If no improvement, repeat every 3–5 minutes to a maximum of 10 times or until ambulance or medical help arrives
- ensure adequate fresh air
- if little or no benefit by 5 minutes, seek medical aid and call an ambulance promptly
- if the casualty is unconscious, follow the DRABC Action Plan and seek medical aid urgently.



Choking

Choking is common to all age groups and is preventable.

Causes


- laughing or crying while eating or drinking
- running and stumbling while eating or drinking
- inadequate chewing of food
- swallowing splinters of bone
- inhaling while eating or drinking.

Symptoms and signs


- coughing
- violent attempts to breathe
- clutching the throat
- increasing blueness of the face, neck, lips, ears and fingernails
- sometimes unconsciousness and absent breathing.

Management

- encourage the casualty to relax and breathe deeply
- ask the casualty to cough to remove the object,


- if unsuccessful, place the casualty with the head low (by upending a child or having an adult bend right over a chair)
- give 3 or 4 sharp blows between the shoulder blades
- as a last resort, try lateral chest thrusts, with the casualty on the side on the floor
-  □ follow the DRABC Action Plan
- seek medical aid urgently.

If the casualty becomes unconscious:

- lie the casualty on the side and give 3 or 4 sharp blows between the shoulder blades
- if unsuccessful, try lateral chest thrusts, with the casualty on the side on the floor
-  □ follow the DRABC Action Plan
- seek urgent medical aid.

Hanging

Management

- grasp the casualty's legs and take the weight of the body
- free the neck by loosening or cutting the noose
-  □ DRABC
- seek medical aid.

Near drowning

Prevention

- learn to swim
- know safety rules for boating and swimming pools
- know basic life saving, rescue and resuscitation techniques.

Symptoms and signs

- no breathing
- blue face and lips
- possibly a fine foamy froth from the mouth and nose
- possibly no pulse.



14.1 Rescuing a near-drowning casualty

Management

Warning: never attempt a rescue beyond your swimming ability. Do not become a casualty yourself.

Remember: every second is vital!

- DRABC
- check the airway and clear water, vomitus and any foreign objects if necessary
- begin mouth-to-nose resuscitation in the water (if possible) and while wading ashore. If you are in deep water, you will need a flotation aid. Do not begin EAR if your safety is jeopardized
- once ashore, check the airway again
- resume EAR
- check the pulse. If absent, begin CPR
- seek medical aid urgently



- if the casualty starts to breathe, and is unconscious, place on the side, keep warm and regularly observe and record pulse and breathing until medical aid arrives.



14.2 Mouth-to-nose resuscitation in water

Overbreathing

Causes

- excitement, hysteria or other emotion.

Symptoms and signs

- normal or pink skin colour
- feeling of choking, suffocation and a need to breathe deeply
- anxiety
- pins and needles in hands, feet and face
- hands may be bent at wrist with fingers straight and thumb against the fingers.



14.3 Management of overbreathing

Management

- firm reassurance
- encourage casualty to take slow, regular breaths
- instruct the casualty to breathe in fresh air and breath out into a paper bag until symptoms disappear.

Strangulation

Management

- remove any material constricting the throat
- DRABC
- seek medical aid.

Swollen throat tissues

Causes

- injury
- allergy
- infection
- stings and bites
- burns
- inhalation of hot gases.

Symptoms and signs

- swelling in the neck
- breathing difficulty.

Management



- DRABC
- depending on the cause, remove from smoke or allergic atmosphere



14.4 Managing a casualty with swollen throat tissues

- if the casualty is carrying any medication for this condition, e.g. for a known allergy, it should be given at once
- manage any bite or sting
- sit the casualty upright
- loosen tight clothing
- ensure plenty of fresh air
- apply ice packs to the throat
- if breathing ceases, give EAR
- seek medical aid urgently.

Disorders of consciousness

Convulsions (infantile)

Convulsions may occur in infants and young children between the ages of 10 months and 4 years. They are often associated with high body temperature resulting from a cold or other illness.

Symptoms and signs

- stiff, rigid body
- twitching limbs
- possible arching of the head and back
- rolling of the eyes
- congestion of the face and neck
- blue face and lips
- unconsciousness.

Management

- ensure a clear and open airway — if necessary turn child head down



14.5 Managing a convulsion

- remove all clothing
- if the child feels hot, sponge down with water that is slightly below body temperature (test with your elbow)
- fan the wet child with a newspaper or magazine to speed up cooling. Do not overcool
- when the child has ceased convulsing and the body temperature has been reduced, cover lightly
- reassure the parents
- seek medical aid.

Diabetes

Diabetes is a condition caused by a disorder of the pancreas, where the body's blood sugar level becomes too high. Diabetics need a medically controlled diet and may require regular insulin

medication. Many diabetics wear or carry a medical alert bracelet, or medical warning card. They may also have glucose or sugar in a pocket or bag.

The first aider may encounter two types of emergencies affecting diabetics — either a very low blood sugar (hypoglycaemia) or a very high blood sugar (hyperglycaemia). Usually the emergency will occur because of very low blood sugar.

Low blood sugar

Causes

- injection of too much insulin
- not enough food containing sugar in a person who takes insulin
- unaccustomed exercise
- a missed meal.

Symptoms and signs

- dizziness
- weakness, trembling or shaking
- hunger
- numbness around lips and fingers
- paleness
- profuse sweating
- rapid pulse
- mental confusion (often aggressive behaviour), which, if the condition is untreated, may progress to unconsciousness.

Management

If the casualty is unconscious:

- DRABC
- give nothing by mouth**
- seek medical aid urgently.



If the casualty is conscious:

- give sugar, glucose or a drink liberally sweetened with sugar, e.g. soft drink or cordial (not diabetic-type cordials). Continue giving sugar every 15 minutes until medical aid arrives or the casualty recovers
- loosen tight clothing
- seek medical aid.

High blood sugar

Causes

- infection in a known diabetic
- insufficient insulin.

Symptoms and signs

- excessive thirst
- frequent need to urinate
- hot dry skin
- rapid pulse
- smell of acetone on the breath (like nail polish remover)
- drowsiness
- unconsciousness.

Management

If the casualty is unconscious:

- DRABC
- seek medical aid urgently.

If the casualty is conscious:

- allow the casualty to self-administer insulin. Do not administer it for the casualty
- seek medical aid. If aid will be delayed, encourage the casualty to drink sugar-free fluids.



Epileptic seizures

Symptoms and signs

- a 'cry' as air is forced out through the vocal cords
- casualty falls to the ground, sometimes resulting in injury, and lies rigid for some seconds with back arched and jaws clenched
- congested, blue face and neck
- jerking, spasmodic muscle movement and colour improvement as breathing starts again
- froth, sometimes bloodstained, from the mouth
- casualty may bite tongue
- possibly, loss of bladder and bowel control
- casualty regains consciousness but may be confused for several minutes, and may be unaware of what happened
- after the seizure, the casualty may be exhausted and sleep deeply.

Management

- DRABC
- protect the casualty from injury, but do not restrict movement. Do not attempt to place anything in the casualty's mouth
- place the casualty on the side as soon as possible
- manage any injuries resulting from the seizure
- if the casualty falls asleep, do not disturb, but continue to check ABC
- seek medical aid. If you know that the casualty is an epileptic, seek medical aid only if the seizure continues for more than 10 minutes.



Stroke

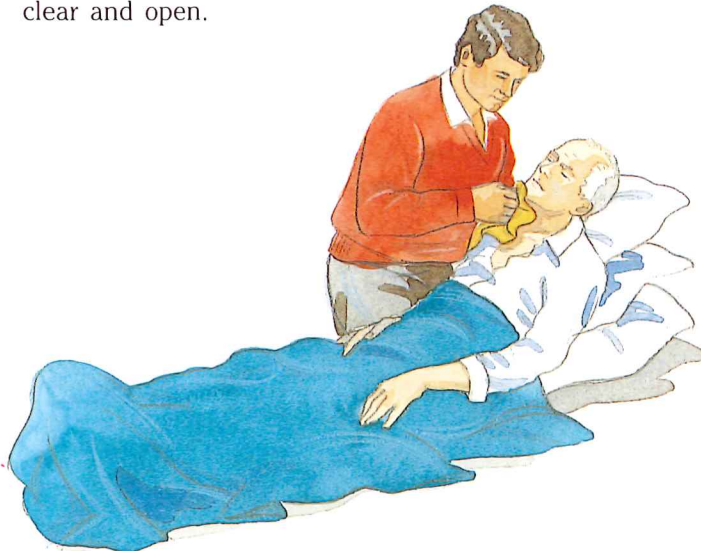
Symptoms and signs

- loss of movement and feeling, usually on one side of the body
- severe headache
- difficulty in swallowing
- altered level of consciousness
- slurred or garbled speech
- flushed face
- sometimes seizures
- pounding pulse
- pupils may be different size
- possibly head and eyes turned to one side
- weakness.

Management



- DRABC
- seek medical aid urgently
- reassure the casualty. He/she may be able to understand you, even if unable to communicate
- if casualty is conscious, support the head and shoulders on pillows, loosen tight clothing, maintain body temperature and wipe away secretions from the mouth. Ensure the airway is clear and open.



14.6 Managing a conscious casualty who has suffered a stroke

Disorders of the heart and circulation

Angina

Angina is due to narrowing of the coronary arteries. Those who suffer from angina are usually under medical treatment, and are likely to understand their problem and carry medication for use during attacks.

Symptoms and signs

- pain or discomfort in the centre of the chest which may radiate up the neck and down either arm, although commonly the left. The onset of the pain is with exercise or emotional stress and is relieved by rest or medication.

Management

- support the casualty in a sitting position
- encourage total rest and provide reassurance
- loosen tight clothing around the neck, chest and waist
- if the casualty carries tablets for angina, tell him/her to place the prescribed dose under the tongue or inside the cheek as indicated on the bottle
- if the pain or discomfort persists for longer than 10 minutes after rest it may indicate a heart attack
- angina sufferers do not normally need to go to hospital or see a doctor after an attack, provided they respond within 10 minutes to rest and/or medication. However, any adult who develops chest pain or shortness of breath should see a doctor.

Fainting

Causes

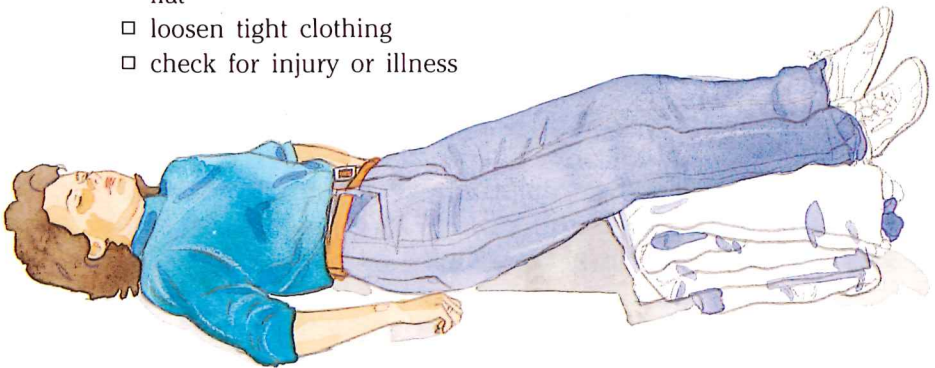
- standing still for a long time, e.g. in a hot stuffy room, or on parade
- sudden change of position, e.g. standing up after sitting
- injury (often minor)
- an unpleasant sight.

Symptoms and signs

- giddiness
- blurred vision
- weakness
- 'hot and cold' feeling
- yawning
- temporary loss of consciousness
- slow, weak pulse
- pale, cold, clammy skin.

Management

- lay the casualty down with legs raised, and head and body flat
- loosen tight clothing
- check for injury or illness



14.7 Managing a casualty who has fainted

- after recovery, let the casualty rest for some minutes before moving
- if the casualty does not recover quickly, follow the DRABC Action Plan and seek medical aid.

Heart attack

Symptoms and signs

- pain or discomfort in the centre of the chest. Pain is sometimes severe and vice-like, and radiates to the arm, or the neck and jaw. It may be confused with the pain associated with indigestion
- anxiety, confusion or distress
- nausea and/or vomiting
- shortness of breath
- pale, cold, clammy skin
- sometimes an irregular pulse
- shock may develop
- sometimes immediate collapse, leading to absence of pulse.

Management

- DRABC
- if conscious, sit the casualty up
- if pulse is weak and rapid or the person is light-headed, place casualty on the side, unless he/she is more comfortable sitting up
- if unconscious, turn the casualty on the side
- seek medical aid urgently.



Heart failure

Symptoms and signs

- acute shortness of breath
- noisy, gurgly breathing
- sometimes, chest pain
- sometimes, frothy bloodstained sputum
- rapid, weak pulse
- swollen, congested neck veins
- swollen legs and ankles
- blue lips and extremities.

Management



- DRABC
- if conscious, sit the casualty up
- loosen tight clothing
- reassure casualty
- seek medical aid urgently.

Sudden death

Symptoms and signs

- rapid loss of consciousness
- no breathing
- no pulse.

Management



- DRABC
- seek urgent medical aid.

15

Poisoning

General information

Poisons Information Centres

A poison is any substance that, when taken into the body, may be harmful to the normal functions of the body.

Poisons may enter the body by:

- the mouth (swallowed)
- the lungs (inhaled)
- the skin (absorbed or injected).

Poisons may be solid, liquid or gaseous. They may be found in food, medications, household substances and industrial products.

Prevention

- when attempting to help a casualty, do not become a casualty yourself
- do not leave poisons or medicines within reach of children. Keep in a locked cupboard
- destroy unwanted medicines and poisons
- use properly labelled, childproof containers for medicines and poisons
- never put poisons or medications into drink bottles
- beware of poisonous fumes or gases in enclosed spaces.

Effects

The effects of poisons vary according to the substance and the amount and may be immediate or delayed.

Poisons that act most rapidly are usually those that are injected or inhaled. Those which are absorbed through the skin usually act most slowly.

Remember:

- record the names of substances taken
- contact the Poisons Information Centre for specific advice on management

- all containers and suicide notes should be sent with the casualty to hospital
- any vomitus should be sent with the casualty to hospital.

Poisons Information Centres

Poisons Information Centres exist in each State and Territory. The national number for information regarding poisons is:

131126

Symptoms and signs

The symptoms and signs of poisoning depend on the nature of the intoxicating substance. Any of the following may occur:

- abdominal pain
- nausea and/or vomiting
- drowsiness
- burning pains, from the mouth to the stomach
- breathing difficulty
- tight chest
- headache
- ringing in the ears
- blurred vision
- a smell of fumes
- odours on the breath
- bite or injection marks, with or without local swelling
- contamination of the skin
- change of skin colour, with blueness of the lips
- burns around and inside the mouth, and to the tongue
- sudden collapse

Management — general rules

If the casualty is unconscious:

- DRABC
- call the Fire Brigade if the atmosphere is contaminated with smoke, gases, ammonia, etc.
- seek medical aid urgently.



If the casualty is conscious but uncooperative:

- listen to the casualty but do not give advice
- seek medical aid urgently.

If the casualty is conscious and cooperative:

- determine whether the substance is corrosive, petroleum-based, medicinal or a general substance
- manage according to the type of substance.

For a **swallowed corrosive or petroleum based** substance, e.g. dishwasher powder, toilet cleaner, kerosene, petrol:

DRABC

- DRABC
- do not induce vomiting
- wash with water or wipe away corrosive substance off mouth and face
- give nothing by mouth
- seek medical aid urgently.

For a **swallowed medicinal, general or unknown** substance, e.g. detergent, medicine, mushrooms:

DRABC

- DRABC
- do not induce vomiting
- give nothing by mouth
- seek medical aid urgently.

For **cyanide** (there may be a smell of 'bitter almonds'):

DRABC

- DRABC
- turn the casualty on the side
- if breathing stops, wash the casualty's mouth and lips, and commence EAR. Do not inhale the casualty's expired air
- seek medical aid urgently.

For an **inhaled** substance:

DRABC

- DRABC
- if necessary move the casualty to fresh air, taking care not to become the next casualty

- loosen tight clothing
- if the casualty has difficulty breathing or shows signs of intoxication, seek medical aid urgently.

For an **absorbed** substance:

- DRABC
- ask the casualty to remove all clothing and shower the skin clean
- ensure that contaminated clothes are laundered separately
- if any symptoms and signs of poisoning are observed, seek medical aid.

The logo for DRABC (Decontamination, Respiration, Absorption, Breathing, Circulation) is displayed in a stylized, pink, outlined font. The letters are arranged in a slightly curved, horizontal line.

16

Bites and stings

Bee

Blue-ringed octopus

Box jellyfish

Bullrout

Centipede

Cone shell

European wasp

Funnel web spider

Jellyfish

Lizards

Red back spider

Scorpion

Snakes

Sting ray

Stonefish

Ticks

Bites and stings of some animals are potentially dangerous as a result of the venom which is injected or because the casualty is allergic to some insects.

Allergic reactions to insect bites

If the casualty has an allergic history or any signs of allergy, e.g. a rash, raised lumps on the skin, swelling of the throat, wheezing, manage as follows:

- 1** DRABC.
- 2** Apply pressure immobilization.
- 3** Seek medical aid urgently.
- 4** Periodically observe and record the pulse and breathing.
- 5** If the casualty is carrying any medication for the allergy, it should be taken at once. If the medication is not identified for this purpose (by the casualty, a relative, or the label), it should not be taken.
- 6** Carry out EAR or CPR if necessary.

Pressure immobilization is used in the case of an allergic reaction, or for management of bites and stings of the following:

- blue-ringed octopus
- box jellyfish
- cone shell
- funnel web spider
- snakes.

Pressure immobilization

Apply pressure immobilization over the bitten area and around the limb, using a crepe or conforming bandage about 15 cm wide. If unavailable, use pantyhose or other material.

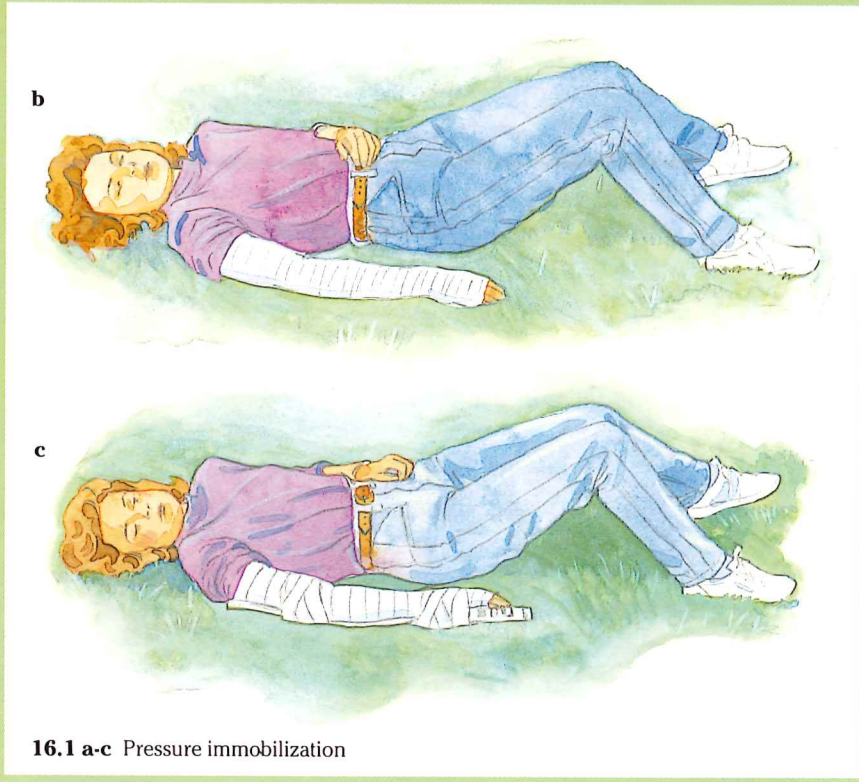
- 1** Apply the bandage firmly enough to compress tissue, but not so firmly as to restrict the flow of blood to the limb below the bandage.
- 2** Bandage from the bite to the fingers or toes, then up to the armpit or groin.
- 3** Bandage as much of the limb as possible.
- 4** Apply a splint to the bandaged limb with a second bandage.
- 5** Do not remove the splint or bandage, once applied.

16.1 a



CONTINUED

CONTINUED

Pressure immobilization

As a general rule, non-lethal bites and stings of land dwelling insects are managed by application of ice compresses, e.g.

- bee
- centipede
- European wasp
- red back spider
- scorpion.

Emergency first aid advice for marine stings is available from the Marine Stinger Reporting Service by phoning 008-079 909.

Detailed management of bites and stings of various animals and insects is described in the following alphabetical listing.

Bee

Bee stings are usually left behind in the skin with the venom sac attached.

Management

- remove sting by scraping it sideways with a fingernail or the side of a knife blade
- wipe the area clean
- apply cold compresses
- if there are signs of allergy, or if the casualty has an allergic history, see the section on allergic reactions at the beginning of this chapter.



16.2 Removing a bee sting

Blue-ringed octopus

The bite of the blue-ringed octopus is normally painless so the casualty may be unaware of the danger.

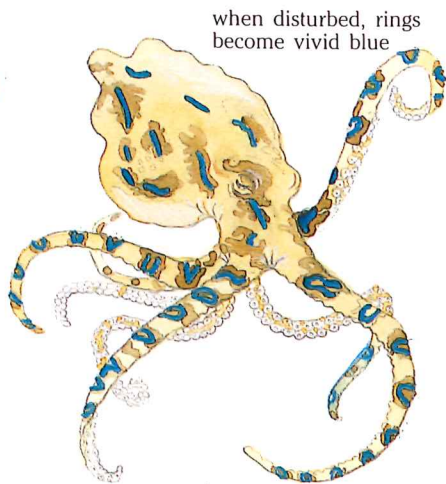
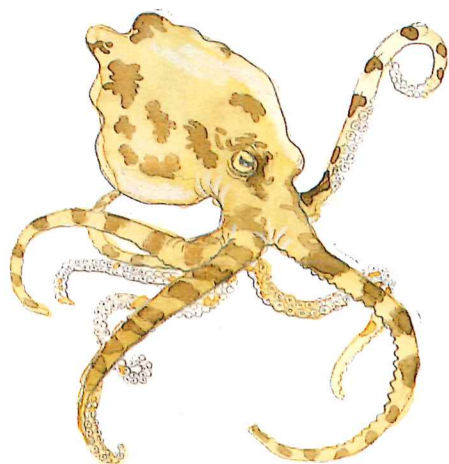
Symptoms and signs

- swallowing difficulty
- blurred vision
- within minutes, numbness of the lips and tongue
- no breathing.

Management



- DRABC
- reassure the casualty and have him lie down
- as breathing difficulty progresses, commence EAR
- pressure immobilization
- seek medical aid urgently.



16.3 a-b Blue-ringed octopus

Box jellyfish

Box jellyfish are found in inshore tropical waters, from the Gladstone area in Queensland, north around the coast to Broome in Western Australia, at all times of the year, but especially between October and May.



16.4 Box jellyfish

Prevention

- obey the instructions of surf lifesavers, particularly if they ask you to leave the water

- swim in stinger-resistant enclosures whenever possible
- wear protective clothing in tropical waters, e.g. a lycra stinger suit, or two pairs of pantyhose, one pair worn over the legs and abdomen, the other, with a small cut across the crotch, over the arms and chest, even when swimming in fenced enclosures
- enter the water slowly — do not run or dive in
- if any sting is felt, back out of the water slowly. Do not struggle
- carry 4 litres of household vinegar and broad conforming or crepe bandages whenever you go to a tropical Australian beach
- if rescuing a casualty from the water, take care not to be stung.

Symptoms and signs

- immediate intense pain
- very obvious whip-like tentacle marks (deep red/mauve skin welts)
- characteristic 'frosted ladder' pattern may be visible
- breathing and circulation difficulties, with cessation of breathing sometimes within a few minutes
- casualty may be irrational. If he/she suddenly becomes quiet, check level of consciousness.

Management

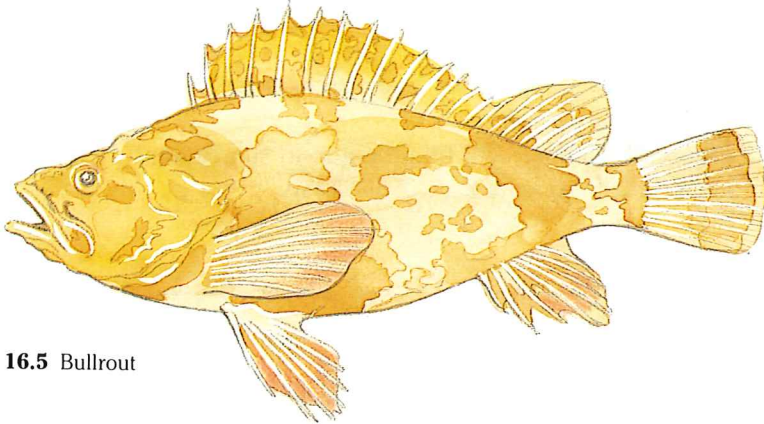


- DRABC
- if necessary**, EAR or CPR
- do not rub the stung area
- if vinegar is available, flood the stung area for at least 30 seconds. Apply pressure immobilization over the area after flooding with vinegar. **Do not** cease resuscitation during this time

- if vinegar is not available, gently pick off any tentacles with tweezers or your fingers. Apply pressure immobilization only above the sting
- continually monitor breathing and circulation
- seek medical aid urgently
- immobilize bandaged limbs with splints and more bandages
- apply ice to relieve pain.

Bullrout

Bullrout are found in tropical inlets, rocky beaches, coral reefs and brackish estuaries.



16.5 Bullrout

Prevention

- investigate before picking up 'funny looking rocks'
- take care when walking on rocks at the seaside. Always wear shoes
- do not put your hands or feet in rock crevices
- wear suitable footwear when wading in deep water or on mud flats.

Symptoms and signs

- immediate intense pain at the site of the puncture
- spread of pain along the limb
- sometimes, the presence of the stinging spine in the wound
- swelling
- stung area may be grey or blue
- the casualty may be irrational
- sometimes sweating and shock.

Management

- DRABC
- seek medical aid urgently
- while waiting, place the affected part in hot fluids, e.g. water or hot drinks, for at least 20 minutes, being careful not to scald the casualty
- remove any foreign body that comes away easily
- reassure the casualty
- observe breathing, and be prepared to supplement the casualty's breathing with EAR if necessary.

Centipede

Centipede bites are painful but not normally dangerous.

Symptoms and signs

- immediate intense burning pain
- throbbing and later, numbness.

Management

- apply a cold pack or compress over the affected area
- seek medical aid.

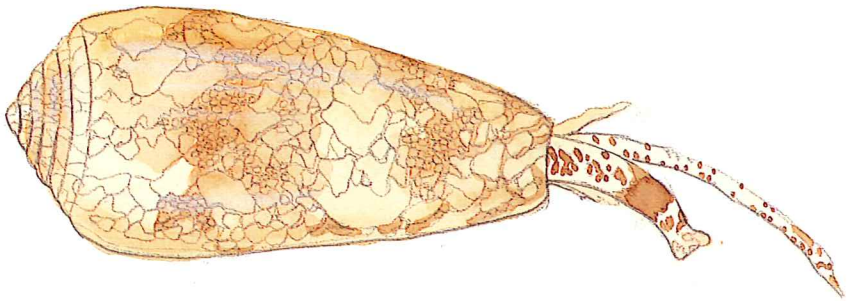
Chironex box jellyfish

See box jellyfish.

Cone shell

Cone shell envenomation is normally painless so the casualty may be unaware of the danger.

For information on symptoms and signs, and management procedures, see section on blue-ringed octopus.



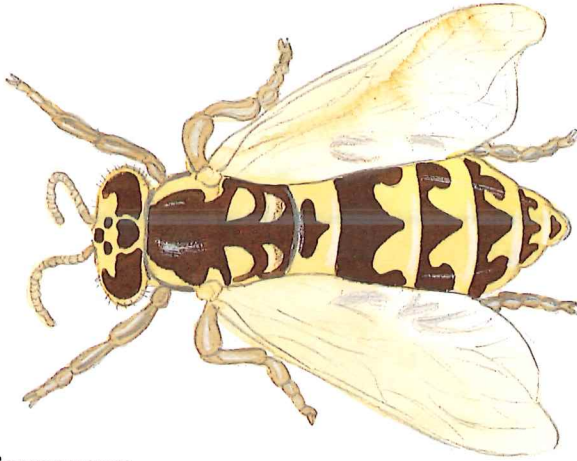
16.6 Cone shell

European wasp

The European wasp can sting several times, because unlike the bee, it does not leave its sting behind in the skin. It is attracted to meat that is being cooked, sweet drinks and decaying food.

Symptoms and signs

- extreme pain
- possibly swelling and blockage of the airway, resulting in breathing difficulty, if stung in the mouth.



16.7 European wasp

Management

DRABC

- DRABC (give EAR if necessary)
- wash the area clean
- apply cold compresses
- if there are signs of allergy, or if the casualty has a history of allergy, see the section on allergic reactions at the beginning of this chapter.

Funnel web spider

The funnel web spider is found around Sydney, on the New South Wales coast and in south-east Queensland. It is a large black or reddish-brown spider, 2 or 3 cm in length.

It is found:

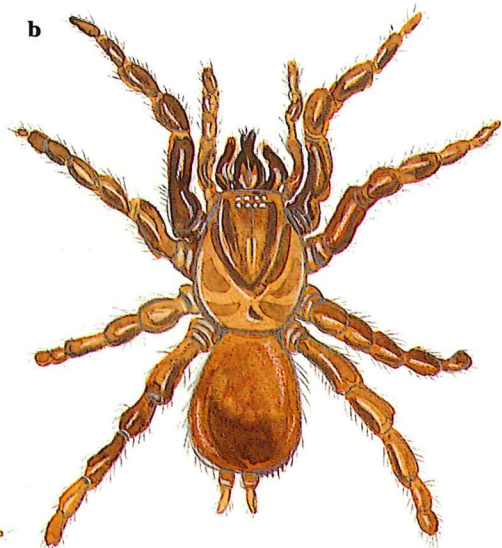
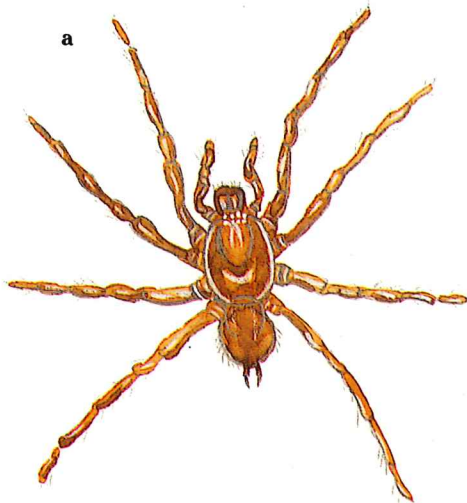
- in rock crevices
- in burrows
- in post holes
- underneath houses
- in trees and shrubs.

Prevention

- show children pictures of the spider and tell them to leave such spiders alone
- if living in areas known to be infested, clean out obvious habitats.

Symptoms and signs

- initially, intense pain at the site of the bite
- nausea and abdominal pain
- breathing may be difficult and noisy
- numbness
- muscular weakness
- profuse sweating
- saliva from the mouth
- coughing up of secretions
- weeping from the eyes
- cold skin and shivering.



16.8 a-b Funnel web spider

Management

- DRABC
- rest and reassure casualty
- apply a pressure immobilization bandage over the bitten area and around the limb
- seek medical aid urgently.

Jellyfish

For symptoms and signs, and management procedures for box jellyfish stings, see box jellyfish. The following information relates to jellyfish, e.g. bluebottles, which are common in Australian oceans.

Symptoms and signs

- visual evidence of stinging, e.g. weals, whip marks, localized area of goose pimples
- pain in the stung area
- pain in the chest and abdomen
- backache
- nausea and/or vomiting
- lack of coordination in the limbs
- breathing difficulty, 10 to 40 minutes after stinging.

Management

- DRABC
- reassure the casualty
- if any tentacles remain, gently pick off with tweezers or your fingers, or wash off with water
- apply cold packs or crushed ice wrapped in a thin towel or cloth to the stung area. Continue until pain is relieved

- do not rub the area
- restrain the casualty's hands
- seek medical aid.

Lizards

Lizards may bite if handled. The bite is not venomous but may become infected.

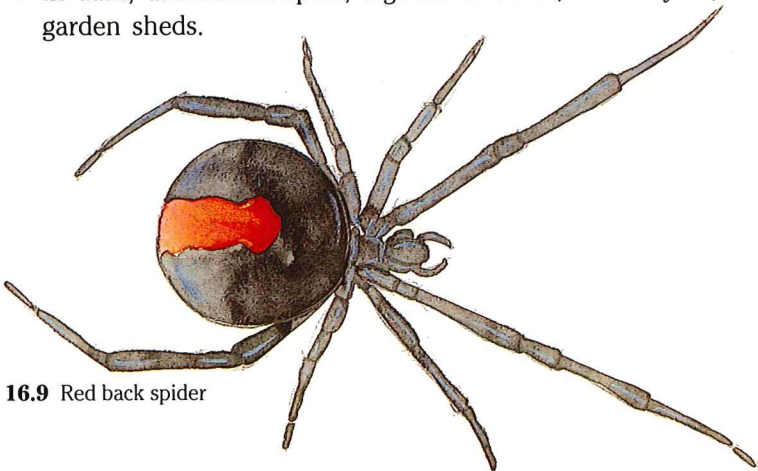
- if the lizard will not let go, apply a lighted match to its mouth
- manage the wound
- seek medical aid.

Red back spider

The red back spider is small, normally black with a red stripe on the back.

It is found:

- throughout most parts of Australia
- in dark, unattended spots, e.g. under eaves, in old tyres, in garden sheds.



16.9 Red back spider

Prevention

- clean out habitats and treat the area with a suitable pesticide
- use gloves when handling old tyres, cleaning out sheds, or carrying out other tasks likely to involve contact with the red back spider.

Symptoms and signs

- a sharp sting may be felt
- pain at the site of the bite, which then becomes general
- nausea
- dizziness and sometimes faintness
- muscle weakness or spasm
- sweating, sometimes profuse
- swelling and localized sweating around the bite
- rapid pulse.

Management

- DRABC
- reassure the casualty
- apply a cold pack or compress over the area
- seek medical aid.

Scorpion

For information on symptoms and signs, and management procedures, see section on centipedes.

Snakes

Snakes are not normally aggressive and tend to bite only when they are threatened or mishandled. Some snakes, e.g. the carpet snake, are not venomous. Others, e.g. the brown snake, tiger snake and taipan, are very poisonous.

Prevention

- leave snakes alone and do not collect snakes
- in snake infested country, wear stout shoes, walk-socks and jeans or similar clothing
- do not wear sandals or thongs or walk in bare feet in places where snakes could be present
- do not put your hands in hollow logs, under piles of wood, or in rubbish
- be noisy when walking in the bush
- look carefully when walking through thick grass
- use a torch around camps or farm houses at night
- keep sheds free of mice
- cut grass short around houses and in school playgrounds.

Symptoms and signs

These do not appear immediately, but from about 15 minutes to 2 hours after the casualty is bitten. There are often no visible symptoms and signs. Take seriously any information that a casualty has been bitten by a snake:

- strong emotional reaction
- headache
- double vision
- drowsiness
- nausea and/or vomiting and diarrhoea
- pain or tightness in the chest or abdomen

- giddiness or faintness
- puncture marks about 1 centimetre apart at the site of the bite, although sometimes there may only be fang scratches on the skin. Bites are usually on the limbs, especially the legs
- swelling of the bitten area
- reddening
- bruising
- sweating
- breathing difficulties.

Management



- DRABC
- rest and reassure the casualty
- apply a pressure immobilization bandage over the bitten area and around the limb (see section on pressure immobilization at the beginning of this chapter)
- seek medical aid urgently.

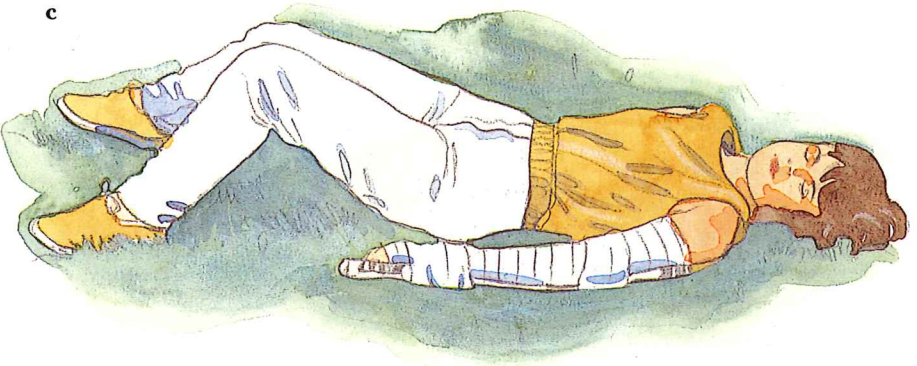
a



b



c



16.10 a-c Managing snake bite

Warning:

- **never** wash the venom off the skin as this will help in later identification
- **never** cut or excise the bitten area
- **never** try to suck the venom out of the wound
- **never** use a constrictive bandage
- **do not** try to catch the snake. However, a description of the snake may assist medical aid.

Sting ray

The sting is attached half way along the sting ray's whip-like tail. This can inflict a very painful wound.

Prevention

- when wading in shallow water, wear protective footwear and shuffle.

Symptoms and signs

- immediate intense burning pain
- possible breathing difficulty
- bleeding from the wound.

Management

DRABC

- DRABC
- gently extract the barb if possible
- bathe with hot water, being careful to test for tolerance temperature with an **uninjured** limb as the stung area may be partly anaesthetized from the toxin
- seek medical aid.



16.11 Sting ray

Stonefish

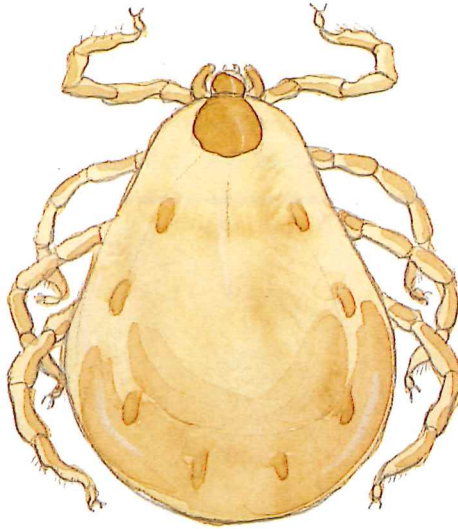
Stonefish are found in tropical inlets, rocky beaches, coral reefs and brackish estuaries. For information and symptoms and signs and management procedures, see bullrout.



16.12 Stonefish

Ticks

Ticks occur in most parts of Australia. However, paralysis ticks occur mainly along coastal eastern Australia, from Queensland to northern Tasmania. Usually drab in colour, ticks are oval and flat. Engorged, they may become globular and about 0.5 centimetres in diameter. They may hide in body crevices. The venom may cause paralysis, especially in small children. Many ticks do not cause paralysis, but may cause local irritation or a skin nodule.



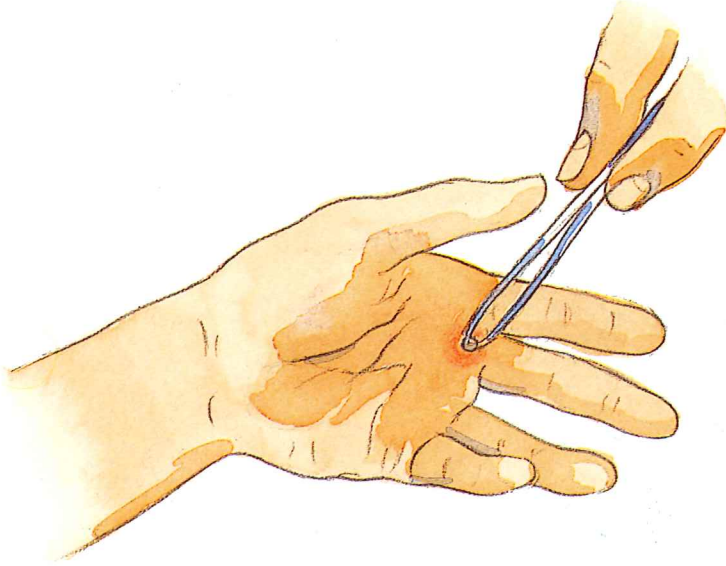
16.13 Tick

Symptoms and signs

- weakness of the face and upper eyelids, progressing to arms and breathing muscles.

Management

- if in the ear, seek medical aid
- remove the tick by sliding the open blades of a pair of small sharp scissors or tweezers, one each side of the tick, and lever the tick outwards, being careful not to leave the mouth parts in the skin
- search carefully for other ticks, particularly in the hair, behind the ears and other body crevices
- if the casualty does not recover after a few hours or if the casualty is a child, seek medical aid.



16.14 Removing a tick

17

Over- exposure to heat and cold

Heat cramps

Heat exhaustion

Heat stroke

Mild to moderate overexposure
to cold

Severe accidental cooling

Frostbite

Cold metal injury

Overexposure to heat

The temperature of the healthy human body is maintained at about 37°C. In hot or humid conditions, e.g. in a boiler room, or travelling in hot climates, people are at risk of heat illness.

There are three stages of heat illness:

- heat cramps
- heat exhaustion
- heat stroke.

Prevention

- protect yourself from strong direct sunlight
- wear loose fitting porous clothing and a broad brimmed hat
- do not do heavy physical tasks in hot humid weather unless conditioned to the task and the environmental conditions
- drink enough water to satisfy your thirst
- avoid alcohol, as this increases urine output, and hence fluid loss
- do not spend prolonged periods in saunas
- do not leave infants or children in closed cars during hot weather
- cease working when affected by heat cramps or heat exhaustion and seek medical aid if the symptoms persist
- do not take part in 'fun runs' and similar activities during the hot summer months.

Heat cramps

Symptoms and signs

- painful muscle cramps of the limbs and abdomen, either while resting or exercising
- nausea and/or vomiting

- tiredness, dizziness or weakness
- moist cool skin.

Management

- remove the casualty to a cool place, if possible
- have the casualty lie down
- replace lost fluid by giving plenty of water to which may be added glucose or sugar. If commercial preparations are used, they should be diluted as recommended by the manufacturer. If the casualty is nauseated, encourage slow drinking
- apply ice packs to the cramped muscles
- gently stretch the muscles, but do not massage
- warn the casualty that further exertion and exposure in the hot environment may lead to heat exhaustion and that he/she should rest or work in a cooler area and/or at a less physically demanding task.

Heat exhaustion

Heat exhaustion occurs mostly in hot, humid climates. The young and the elderly are more at risk, as are dehydrated casualties and those wearing unsuitable clothing when working or exercising.

Symptoms and signs

- feeling hot, exhausted and weak, with a headache which may have persisted for some hours or days
- thirst
- fatigue
- nausea
- loss of appetite
- giddiness and faintness

- stomach and muscle cramps
- shortness of breath
- muscular weakness
- lack of coordination
- pale, cool and clammy skin
- profuse sweating
- rapid breathing and pulse
- possibly, confusion or irritability.

Management

- move the casualty to a cool place with circulating air, and lay him/her down
- loosen any tight clothing and remove any unnecessary garments
- sponge the body down with cold water, but do not overcool
- replace lost fluid (as for management of heat cramps)
- seek medical aid if the casualty vomits and cannot keep fluid down, or does not recover promptly
- manage cramps as previously outlined.

Heat stroke

Heat stroke is a potentially lethal condition. Early recognition of heat stroke is essential. Those at risk of heat stroke include:

- infants left in closed cars on a hot day
- athletes attempting to run long distances in hot weather, particularly fun runners
- unfit workers and overweight alcoholics in hot climates
- the elderly or ill.

Symptoms and signs

- headache
- nausea and/or vomiting

- dizziness
- visual disturbances
- often, irritability or mental confusion, and possibly aggression
- altered mental state, which may progress to seizures and unconsciousness
- a rise in body temperature to 40°C or more
- a strong pounding and rapid pulse
- skin flushed, and usually dry.

Management

- DRABC
- remove the casualty to a cool place
- loosen any tight clothing and remove any unnecessary garments



17.1 Managing heat stroke

- apply cold packs or ice to the areas of large blood vessels, such as the neck, groin and armpits, to accelerate cooling
- if possible, cover the casualty's body with a wet sheet and fan to increase air circulation
- continue until the body feels cold to the touch, then stop cooling
- seek medical aid urgently
- when the casualty is fully conscious give fluids (as for management of heat cramps).

Overexposure to cold

Overexposure to cold can occur:

- following immersion
- as a result of wind chill
- when in the snow without protective clothing
- in lightly clad runners and motorcyclists exposed to wind
- in divers
- in unconscious, immobile or drugged persons in a cold environment
- in young children, babies and the elderly in a cold environment.

The severity of overexposure depends on:

- age and physical condition
- clothing
- temperature
- wind speed
- period of exposure

The following will accelerate the condition:

- low atmospheric temperature

- wind, snow, rain
- fatigue
- anxiety
- hunger.

Prevention

- wear warm inner clothing made from material specially designed for extremely cold environments
- wear wind and waterproof outer clothing
- ensure adequate protection of the ears and nose
- have a minimum of four persons in your party
- ask locals about usual weather conditions if boating, skiing or mountain climbing in an unfamiliar area
- listen to broadcast weather reports
- be sure that boats or other equipment are in good condition
- have adequate sleeping bags and covers
- eat adequate food before departure
- take adequate food and drink (not alcohol) with you
- inform people of your departure and expected time of return
- if caught in bad weather take shelter early and watch for signs of cold exposure
- take steps to avoid more physical activity than is necessary when conditions are extremely cold.

Mild to moderate overexposure to cold

Symptoms and signs

- a cold feeling and shivering
- excessive fatigue
- problems with vision
- faintness
- cramps

- increasing slowness of physical and mental responses
- uncoordinated movement, e.g. stumbling
- confusion
- slurred speech.

Management



- DRABC
- protect the casualty and yourself from wind, rain and sleet and from cold, wet ground
- if possible, remove wet clothing and wrap the casualty in warm, dry clothing or a space blanket



17.2 Managing overexposure to cold

- if possible, put the casualty in a warmed sleeping bag
- if the casualty is conscious give warm fluids to drink
- do not give alcohol
- place the casualty in a bath of water heated to about 37°C and raise the temperature of the bathwater slowly to about 40°C.
- if a warm bath is not available, a companion stripped to underclothing and sharing the casualty's sleeping bag can help to warm the body

- do not try to warm the casualty in front of a fire
- seek medical aid if recovery is not prompt
- remain with the casualty until medical aid arrives.

Severe accidental cooling (hypothermia)

Hypothermia is a dangerous condition, commonly caused by prolonged immersion in cold water. Infants, the infirm and the elderly are especially at risk. Alcohol, drugs and injury may aggravate the condition.

Symptoms and signs

- coldness
- slow pulse
- slow, shallow breathing
- quietness and refusal of food in infants
- unconsciousness, especially in the elderly or the ill.

Management

- DRABC — it is important to ensure that breathing and pulse are absent before commencing resuscitation. If the heart is still beating, even slowly, chest compressions could be lethal.
- remove to a warm dry place if possible
- place the casualty between blankets so that the temperature can rise gradually
- if conscious, give warm drinks (not alcohol)
- a companion stripped to underclothing and sharing the casualty's sleeping bag can help to warm the body
- seek medical aid urgently
- remain with the casualty until medical aid arrives.



Warning: do not attempt to speed up the warming process by placing the casualty in a hot bath, or by using hot water bottles or electric blankets.

Frostbite

Frostbite results in local freezing of body tissue, e.g. toes, fingers and other extremities. Deep frostbite may affect the blood supply so badly that amputation may be necessary.

Superficial frostbite

Symptoms and signs

- numbness and tingling in exposed areas
- sudden whiteness of the skin
- waxy appearance
- firmness to touch
- area is painless until rewarmed
- possible blistering.

Management

- remove the casualty to a warm dry place
- remove anything constricting the affected limb
- rewarm the area by body heat
- never rub or massage the frostbitten area
- never apply snow or cold water
- never rewarm with direct heat
- cover any blisters with dry sterile dressings
- give no alcohol
- seek medical aid.

Deep frostbite

Symptoms and signs

In addition to those for superficial frostbite:

- the area is white, hard to the touch and painless.

Management

- do not attempt to thaw
- keep the casualty dry and warm
- protect the injured area from further injury
- seek medical aid urgently.

Cold injury

Wear gloves to avoid skin adhering to extremely cold metal.

Management

- pour warm water over the part, and when free, manage as for superficial frostbite
- seek medical aid for blistering or other tissue damage.

18

Traffic accident injuries

Danger

Calling help

Helping the trapped casualty

Motorcyclists' protective helmets

Danger

- ensure that you, others and the casualty are safe
- avoid danger from oncoming traffic. Protect the scene by parking your car between it and approaching traffic
- switch on hazard warning lights or indicators
- station people to warn other motorists of the accident, particularly if the scene is not visible to approaching vehicles
- at night, light up the scene with headlights on low beam
- set up reflective warning triangles if available
- keep clear of fallen electricity wires
- ensure that all occupants of the vehicle(s) are accounted for
- check for the presence of flammable liquids, e.g. petrol, and if possible, have fire extinguishers ready for use
- casualties may be trapped and injuries may be hidden by wreckage
- turn off the ignition of the crashed vehicle, apply the handbrake and chock wheels if on a slope
- protect the casualty from battery acid, hot liquids, engine or exhaust parts
- do not disconnect the battery of a damaged vehicle
- if the vehicle has an 'LPG' sticker on the number plate, turn off the gas at the large valve on top of the LPG tank.

Do not:

- smash glass unless the casualty is protected
- attempt to right an overturned vehicle
- allow smoking at the scene of an accident
- touch the vehicle or occupants if fallen electricity wires are in contact with the vehicle.

Calling help

- dial 000 in any state capital, or the number listed in the telephone directory. If another vehicle has CB radio or a mobile phone, use it to call help
- instruct a bystander to contact the nearest ambulance or emergency service and police
- **ensure that the message is understood**
- check the approximate waiting time before help will arrive.

Helping the trapped casualty

- DRABC
- send for expert assistance urgently
- if the door nearest the casualty is jammed, try to gain entry through other doors or windows
- if possible, remove heavy objects. If the dashboard or steering wheel are compressing the casualty's chest, slide the seat back or tilt the back of the seat down slightly
- tilt the casualty's head backwards, with jaw support so that the airway remains open



18.1 Opening the airway of a trapped casualty

- look under debris in the vehicle to ensure that no casualties are hidden from view
- ensure that battery acid, hot water, oil or petrol do not splash onto the casualty
- **do not** remove the casualty, particularly if unconscious, unless absolutely necessary. Wait for expert help.

Dangerous situations where you may need to move a casualty from inside a crashed vehicle

- 1 When there is evidence of increasing shock and the casualty is upright in the car.
- 2 When the casualty is unconscious and an adequate airway cannot be maintained.
- 3 When the casualty's position prevents access to control bleeding.
- 4 When there is danger of fire.

Moving a casualty from inside a crashed vehicle



- DRABC
- only remove the casualty if in danger, as described above
- keep the airway clear
- try to support the spine and head in such a way as to avoid movement in any direction
- apply a cervical collar while the casualty is still in the vehicle
- recruit enough people to support all parts of the casualty's body
- give your helpers clear instructions on how the casualty is to be moved
- carry out the movement smoothly.

Moving a casualty from beneath a vehicle

If a casualty is trapped under a vehicle and has to be moved before expert help arrives, the vehicle may need to be raised:

- DRABC
- chock the wheels and use packing, e.g. blocks of timber, as the vehicle is raised. Raise only to a level that enables you to free the casualty
- move the casualty as gently as possible, supporting the head and neck
- when removing a casualty from beneath a motorcycle, avoid handling hot engine and exhaust parts
- note the exact position of the casualty and vehicle before moving, for reporting to police.



Motorcyclists' protective helmets

Only remove a helmet if absolutely necessary, e.g. when it is obstructing the casualty's breathing or if the casualty is vomiting. If removal is necessary, ask the casualty to remove it if possible.

To remove an open face helmet:

- unfasten or cut through the chin strap
- force the sides apart

18.2 a



- lift the helmet upwards and backwards.

b



c

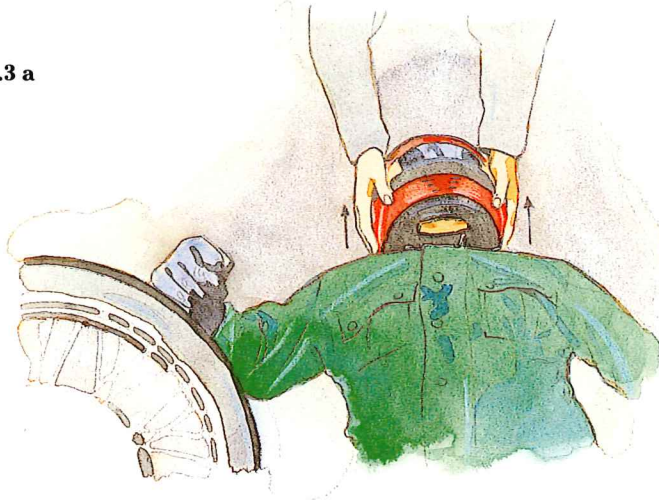


18.2 a-c Removing a motorcyclist's helmet (open face)

To remove a full face helmet:

- unfasten or cut through the chin strap
- one person must support the casualty's head and neck while the other lifts the helmet
- tilt the helmet back

18.3 a



- lift it clear of the chin

b

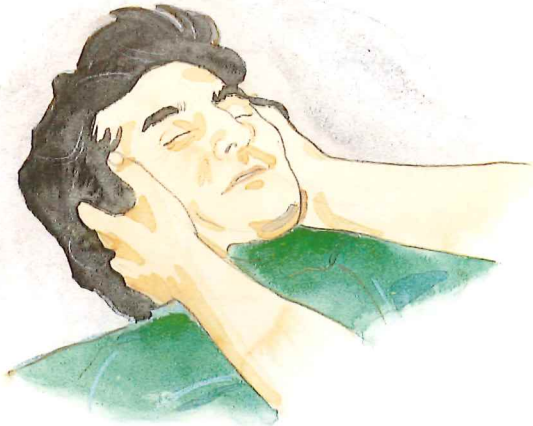


- tilt it slowly forward to pass over the base of the skull.

c



d



18.3 a-d Removing a motorcyclist's helmet (full face)

19

Communicable diseases and the first aider

Communicable diseases

Means of transmission

Hygiene before first aid

Hygiene after first aid

Recommended equipment

Communicable diseases are those diseases which can be spread from one person to another. They are caused by germs such as bacteria and viruses.

Medical studies have indicated that a first aider is unlikely to develop any of these diseases as a result of attending to a casualty. Because the risk to the first aider is so low, it is advised that first aid should not be withheld.

Many communicable diseases can be present in the body before symptoms and signs become evident. Therefore the first aider should assume that any casualty may provide an element of risk, and should always observe hygiene procedures, as described in this chapter.

Some illnesses that may result, in either rescuer or casualty, from contact during resuscitation procedures

- colds
- influenza
- measles and mumps
- glandular fever
- hepatitis strains
- HIV infection
- herpes
- tuberculosis
- some forms of meningitis
- some skin infections, e.g. impetigo.

These diseases may be passed on by some of the following

- by blood and body fluids, e.g. saliva, vomit, pus, urine, seminal fluid, vaginal fluid, faeces and possibly breast milk

- by infected hypodermic needles or sharp objects
- through sexual intercourse where one partner is infected
- by sharing hypodermic needles that have been used by/on an infected person
- through transfusions of contaminated blood or injections of contaminated blood products
- through droplet infection
- an infected mother can pass diseases to her child before and during birth, or possibly through breast milk.

First aiders need to be careful to avoid contamination through cuts, grazes or mucous membranes, or from infected hypodermic needles or sharp objects that may pierce the skin.

Steps to take before management of a casualty

Use the following checklist of hygiene procedures before managing a casualty:

- wash your hands thoroughly with soap and water if available
- cover exposed cuts and grazes with waterproof dressings
- put on disposable plastic or rubber gloves, if available. These should be long enough to cover the lower forearms and/or to be tucked under the sleeves
- put on a plastic apron to protect clothes, if available.

Hygiene after management

Use the following checklist of hygiene procedures after managing a casualty:

- if clothing has been splashed with blood or body fluids, it is advisable to soak it in the strongest recommended solution of a name-brand household bleach for 30 minutes. Usually this solution will be one part of bleach to nine parts of water, but you should follow the instructions on the container. Always

use a freshly prepared solution of bleach. Wash clothing following disinfection. If bleaching is not appropriate, machine-wash clothing in the normal way, using the hottest possible water temperature

- clean contaminated surfaces by covering for 30 minutes with paper towels which have been soaked in the strongest recommended solution of a name-brand household bleach. Wash the wet areas with water and household detergent, and dry them thoroughly
- burn combustible waste materials
- waste materials that cannot be burned should be placed in a plastic bag inside another plastic bag. Tie the bags securely and dispose of them safely. Seek advice about safe disposal from your local hospital or doctor
- if a mask is used for resuscitation, wash it thoroughly in cold running tap water, making sure that no splashing of nearby areas occurs. Soak the mask for 30 minutes in the strongest recommended solution of a name-brand household bleach. Wash it thoroughly in water and household detergent and dry well
- finally, wash your hands thoroughly with soap and water.

Remember:

- if splashed by blood or other body fluids, skin should be washed thoroughly with soap and running tap water
- if lips, mouth, tongue, eyes or broken skin come into contact with blood or other body fluids, wash thoroughly with clean, cold running tap water
- if skin is punctured by a sharp object that may be contaminated, wash the area thoroughly with soap and running tap water, and seek medical advice as soon as possible
- use household bleach only in well ventilated areas
- do not put plastic bags of non-combustible waste material in the rubbish tin.

Recommended equipment

St John Ambulance Australia has prepared a Communicable Diseases Protection Pack to be used in conjunction with first aid kits. It contains a face mask, disposable goggles and gloves.



19.1 Communicable Diseases Protection Pack

Glossary

Abdomen	part of the body between the chest and the pelvis, containing digestive organs
Abrasion	an open wound caused by direct contact with a rough surface
Absent breathing	no perceptible sign of breathing
Absent circulation	no perceptible pulse
Absent pulse	no detectable heartbeat
Absorb	to take up fluids or gases
Acetone	a colourless liquid which is used as a solvent and smells like nail polish remover
Acid	a corrosive substance; a neutralizer of an alkali
Acute pain	pain which is sharp; severe and short in duration
Airway	the passage by which air enters and leaves the lungs
Alkali	a corrosive substance; a neutralizer of acid
Allergic	sensitive to some substance, such as bee venom
Amputation	the cutting off of a limb, digit, or appendage

Angina pectoris	a heart condition in which there is an acute pain in the chest caused by interference with the supply of oxygen to the heart, usually brought on by exercise or anxiety
Antiseptic	a substance that helps to prevent the growth of germs
Anus	the external opening of the rectum
Artery	a vessel carrying blood away from the heart
Asphyxia	lack of oxygen and increase of carbon dioxide in the body
Assessment	evaluation of problems affecting the casualty as indicated by the history, symptoms and signs observed by the first aider
Asthma	spasm of the bronchial tubes
Bandage	material used to cover or hold in place a sterile dressing
Bowel	part of the digestive canal below the stomach and duodenum
Breastbone	the flat bone which forms the middle of the front of the chest and which separates the ribs
Capillaries	smallest blood vessels
Cardiopulmonary resuscitation	a resuscitation technique that combines expired air resuscitation with external cardiac compression
Carotid pulse	the heartbeat as felt in the arteries of the neck

Casualty	someone who has suffered an accident or sudden illness
Cervical	pertaining to the neck
Cholesterol	fatty substance deposited from the blood in the arteries
Circulation	the movement of blood through the body
Combustible	able to be burned
Communicable diseases	diseases, caused by germs such as bacteria and viruses, that can be spread from one person to another
Compress	a cold dressing that assists control of bruising and swelling, and helps relieve pain
Concussion	injury to the brain, usually caused by a blow, sometimes leading to dizziness, nausea, loss of consciousness and weak pulse
Constrictive bandage	a firmly applied bandage above the injury site, and above the middle joint of the limb, to control bleeding; used only when direct pressure fails
Convulsions	violent and involuntary contractions of the muscles, often called seizures or fits
Cornea	the 'window' of the eye
Corrosive	destroying gradually; eating away a surface
CPR	cardiopulmonary resuscitation
Crater wound	wound caused by tissue being torn from the body

DRABC	stands for Danger, Response, Airway, Breathing, Circulation — the St John Action Plan for first aid management
Dehydration	excessive loss of salt and water from the body
Diabetes	disease of the insulin-producing cells in the pancreas
Diaphragm	the dome-shaped muscular wall separating the abdomen from the chest cavity
Direct pressure	method for controlling bleeding
Disc	a layer of fibro-elastic tissue between two vertebrae
Dislocation	injuries in which the bones of a joint are pushed out of normal contact with each other
Disorientation	a state of mental confusion, particularly relating to time and place
Distend	swell out, inflate
EAR	expired air resuscitation
ECC	external cardiac compression
Envenomation	poisoning from bites, stings or penetrating wounds — usually from reptiles, insects and marine creatures
Epilepsy	a condition of the brain leading to seizures
Exhale	breathe out
Expired air resuscitation	the technique used by the first aider when the casualty is unable to breathe. Also known as EAR

External cardiac compression	compression of the heart from outside the body by pressing on the breastbone in order to try to provide artificial circulation of the blood
Extremities	fingers and toes
Faeces	waste food products passed by the bowel
Fainting	a form of loss of consciousness
Flail chest	a condition caused by multiple fractures of the ribs and instability of the rib cage
Flammable	easily set on fire
Forearm	the part of the arm between the elbow and the wrist
Fracture	a break in a bone
Genitals	the reproductive organs
Heart	the hollow muscular organ responsible for pumping blood
Heat stroke	a serious, life-threatening condition in which the body's temperature is dangerously high
History	when relating to first aid, the story of the incident or the illness obtained from the casualty or witnesses
Hyperglycaemia	high blood sugar
Hypoglycaemia	low blood sugar
Hypothermia	the severe accidental cooling of the body
Immobilize	to prevent from moving
Incision	a cut made by a sharp instrument

Infection	the invasion and growth of harmful germs in the tissues of the body
Inflammable	easily set on fire
Inflammation	may be caused by infection and is characterized by pain, heat, swelling and redness
Inhale	breathe in
Insulin	a hormone produced in the pancreas which controls the use of sugar in the body
Intestines	the lower part of the alimentary canal
Intoxication	a state of excitement or drunkenness induced by alcohol or other drugs
Ipecacuanha	a drug used to induce vomiting, also known as Syrup of Ipecac
Irrigate	to wash a wound with a constant stream of water
Jaw support, jaw thrust	procedures for opening the airway
Lethal	deadly
Ligaments	tissues connecting bones at joints
Liver	a large organ located in the upper abdomen
Lungs	the pair of breathing organs in the chest cavity
Medication	medicine
Microorganisms	germs

Mucus	sticky fluid from some parts of the body, e.g. the nose, bronchi
Nausea	a feeling of sickness
Nerves	tissues that convey impulses from one part of the body to another
Nostril	the openings of the nose
Obstructed	blocked
Oxygen	a gaseous element of air that we breathe in
Pallor	paleness of skin
Pancreas	a gland that produces insulin and alkaline digestive matter
Paradoxical breathing	seen in flail chest injuries — the injured side moves in on inspiration and balloons out on expiration
Paralysis	loss or impairment of the ability to move parts of the body
Pelvis	the bone structure that forms the lowest part of the trunk
Posture	the body's attitude
Pressure pad	firm pad applied over dressing to assist in control of bleeding
Pressure points	points where pressure can be applied to control bleeding
Pulmonary	relating to the lungs
Pulse	the transmission of the heartbeat felt in various parts of the body

Pupil	the opening in the centre of the iris of the eye
Respiration	breathing
Response	the first aider's means of assessing the casualty's state of consciousness
Resuscitation	reviving one who is seriously injured or apparently dead
RICE	Rest, ice, compression, elevation: the method used by first aiders to manage soft tissue injuries
Saliva	secretions in the mouth
Seizures	violent muscular contraction and relaxation (convulsions)
Shock	a condition in which the circulatory system is not carrying sufficient blood to the tissues
Signs	the features of the casualty's condition that can be seen, felt, heard or smelt
Sinus	any of the eight cavities in the skull that are connected with the nasal cavity
Skeleton	bones of the body
Skull	the bony framework of the head, enclosing and protecting the brain, and consisting of the cranium and the facial section
Spasm	sudden involuntary muscular contraction
Spinal cord	the bundle of nervous tissue extending from the base of the brain and which is surrounded and protected by the spine

Spleen	an organ in the abdomen
Sprain	stretching of the ligaments
Sputum	mucus from the lungs, bronchi and throat that is ejected through the mouth
Sterile	free of germs
Strain	overstretching or overexertion of a muscle
Stroke	a cerebro-vascular accident resulting in partial paralysis
Suffocation	death from lack of oxygen
Symptoms	what the casualty tells you about his condition
Syrup of Ipecac	a drug used to induce vomiting
Tetanus	a serious and potentially fatal infection
Toxic	poisonous
Unconsciousness	a condition in which the brain fails to respond to the messages sent to it
Urine	waste products removed from the blood by the kidneys
Vagina	the passage leading inwards from the external female genitalia
Venom	a poison, normally from a snake, insect, marine creature or other animal
Vertebrae	(singular: vertebra) the individual bones that make up the spinal column
Vomitus	stomach contents vomited up

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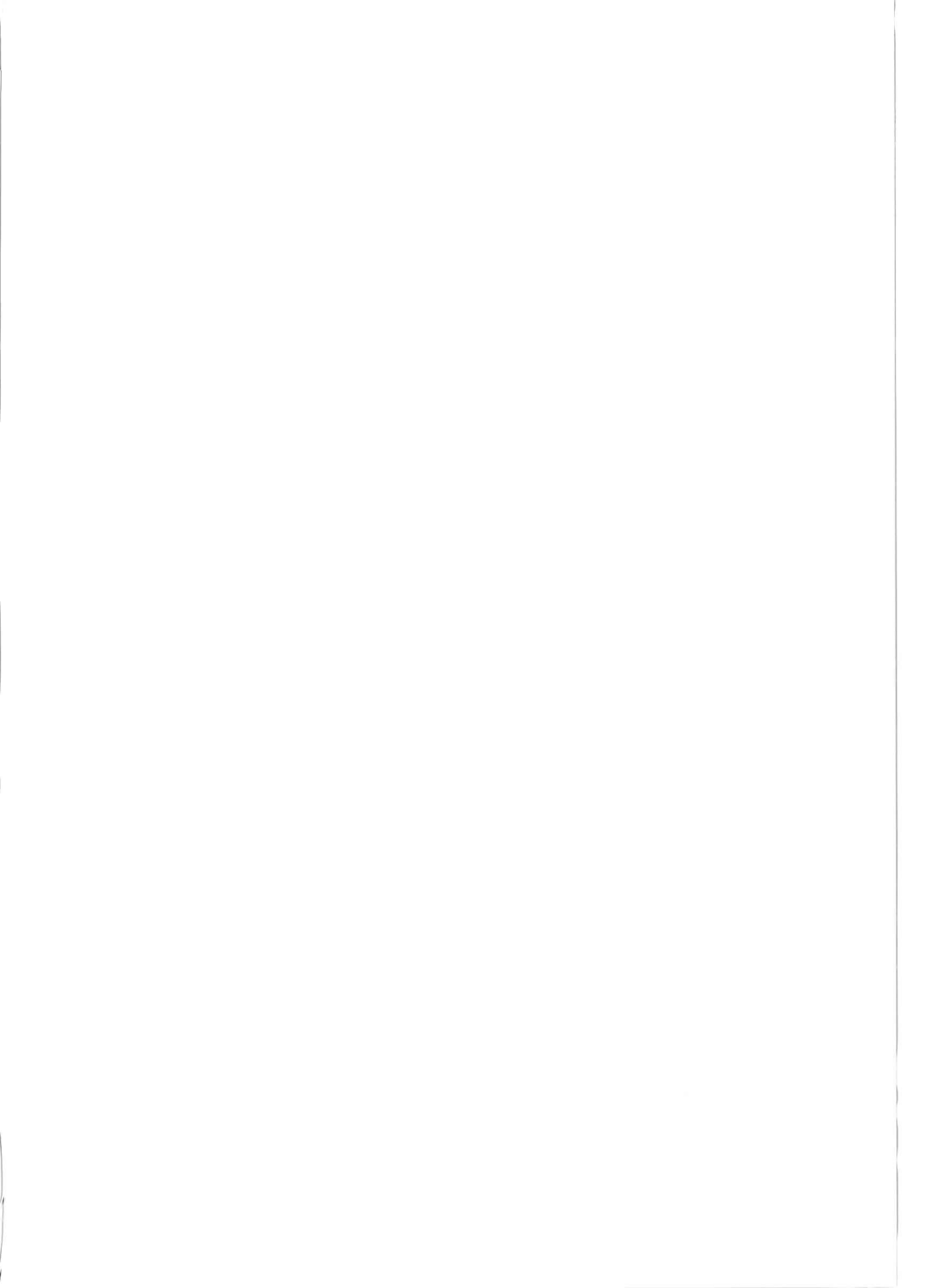
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VOLUME TWO



Australian

FIRST AID

Second Edition

VOLUME TWO



**An authorized manual of
St John Ambulance Australia**

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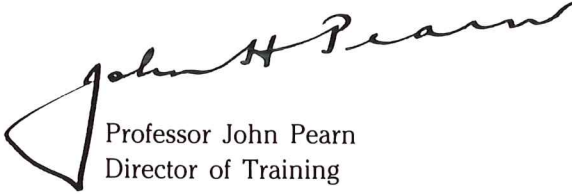
Foreword

Australian First Aid has become established as a major resource for the teaching of first aid to the Australian public. It is now some 20 years since St John ambitiously decided to produce and publish its own first aid manuals for Australian conditions. This new manual follows in that tradition. It has again been wholly set up, printed and published in this country. The entire text has been rewritten, the layout altered to improve the impact of the text, and a new series of illustrations has been produced. The book has been divided into two volumes for easier handling. Volume 1 comprises chapters 1 to 19 and is designed to accompany the Senior First Aid course. It provides information for emergency first aid and the management of common injuries and illnesses. Volume 2 comprises chapters 20 to 31 and contains advanced and specialist first aid information.

There has been a significant departure from the context of previous manuals. First aid is a practical subject. Whilst some theoretical knowledge can help students understand why a particular treatment is necessary, the theoretical component has been reduced with the major emphasis being placed on diagnosis and management. Wherever possible, the steps in management have been simplified and every attempt has been made to ensure that the subject material is relevant to everyday life.

Australia is well supported with emergency services. However, the size of the country makes it impossible for those services to be immediately available. Consequently, there is frequently a requirement for someone to render the initial aid. We believe that this text provides information that will be useful for all Australians.

While the text sets out in detail the steps in diagnosis and management, it is no substitute for a first aid course. It is only by participating in such a course that one can become fully proficient and skilled in the management of the ill and injured.

A handwritten signature in black ink that reads "John H. Pearn". The signature is written in a cursive style and is positioned above the printed name and title.

Professor John Pearn
Director of Training

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20

How the human body works

The respiratory system

The circulatory system

The nervous system

The skeletal system

The digestive system

The urinary system

The skin

The eye

The ear

The nose

The human body is made of millions of tiny living 'building blocks' called cells. Groups of cells that perform a special function, such as the lining of the mouth, are called tissues.

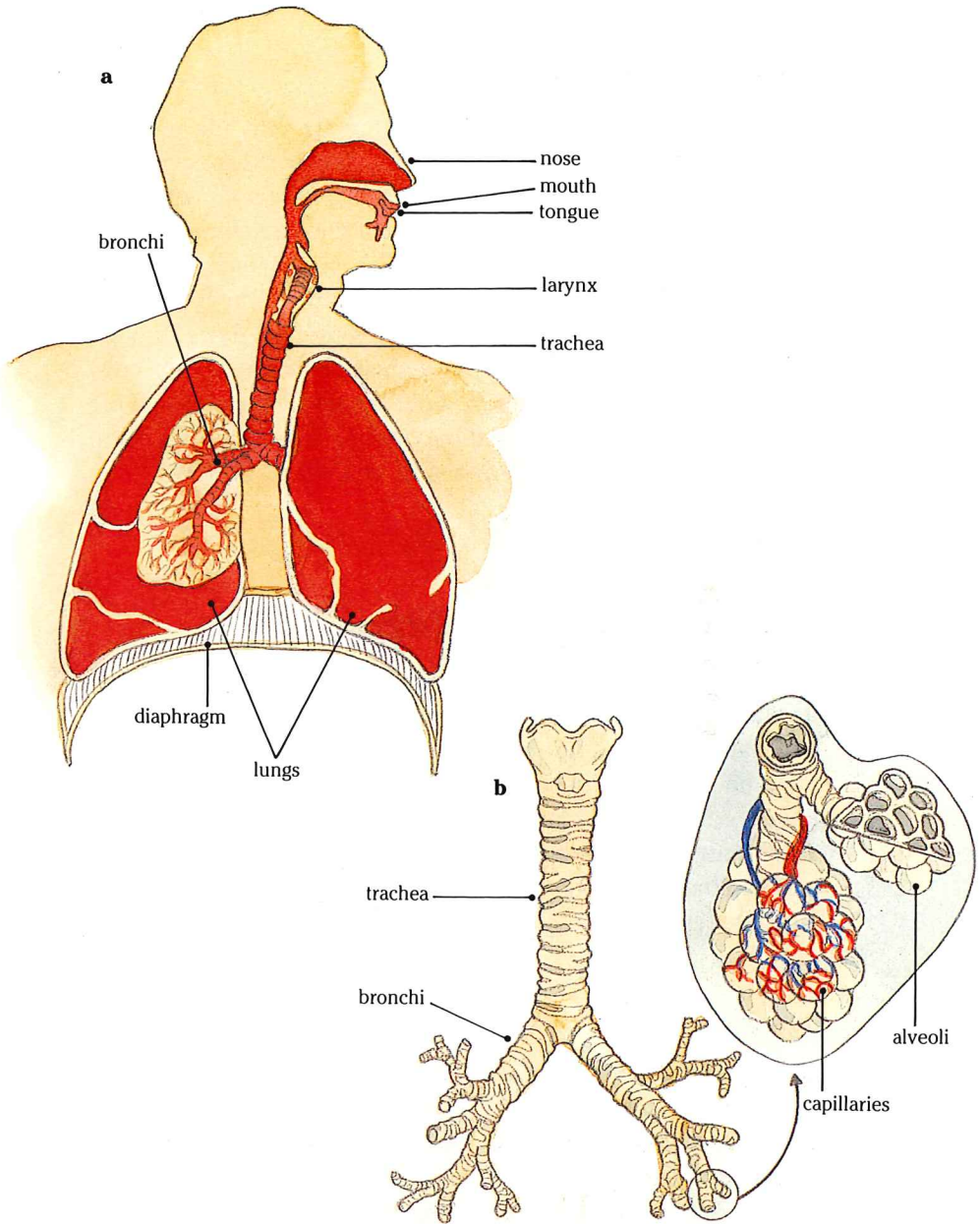
Different types of tissues grouped together to perform a special task are called organs. Organs are usually part of a system, e.g. the heart is part of the circulatory system. The human body is a living machine that converts food into energy. For this to happen, each cell has to be provided with food, oxygen and water and a waste disposal system. The various systems in the body provide these services.

The respiratory system

The act of breathing in, removing oxygen from the air, and breathing out air containing increased amounts of carbon dioxide, is called respiration. Every time a breath is taken in, air is drawn through the mouth or nose and down the windpipe into the lungs. The windpipe branches into two main tubes before it enters the lungs, where it divides into many smaller tubes that branch out through the lung tissue. At the end of each tube is a tiny air sac, which is surrounded by blood vessels. The blood in these vessels takes up oxygen, a gas contained in the air, and gives off a gas called carbon dioxide, which is a waste product of the process that converts food into energy. In breathing out, the air passes back through the same passages.

The major components in the respiratory system include the:

- mouth and nose
- larynx (voice box)
- trachea (windpipe)
- bronchi (tubes that divide from the windpipe)
- alveoli (air sacs)
- rib cage
- diaphragm.



20.1 a-b The respiratory system

Mechanics of breathing

For air to enter the air passages and the air sacs, the pressure in the lung tissue must be lower than the air pressure outside the body. To enable this to happen, the diaphragm moves down, a little like a plunger in a syringe, and at the same time, the ribs and chest wall move out. The result is an increase in space inside the chest and a lowering of the pressure in the lung. Since this pressure is now lower than air pressure, air flows through the air passages (inspiration). To exhale (expiration), the pressure must rise. This is brought about by the diaphragm moving up and the ribs and chest wall moving in. The action of breathing in and out resembles the action of a set of bellows.

The circulatory system

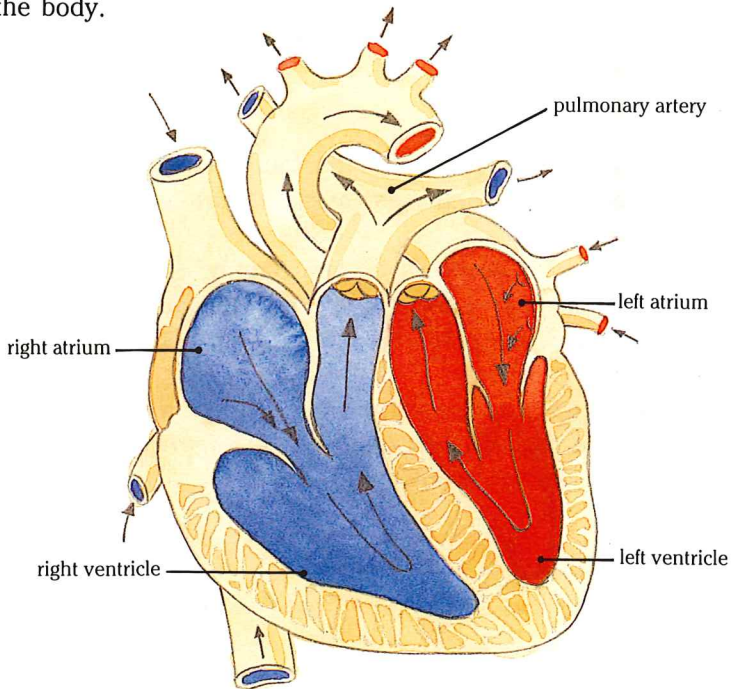
The circulatory system acts as the transport system of the body. Its vital role is to carry oxygen, water and food to all parts of the body and at the same time to remove waste products. It also plays an important function in maintaining a constant body temperature. The driving force for this transport system is the heart. The transporting medium is the blood and the arteries. Veins and capillaries provide the pipes through which the blood can circulate.

The heart

The heart is a muscular pump which is located in the centre of the chest. It is approximately the size of a clenched fist. It is divided into four separate chambers. Two chambers act as reservoirs and two have a pumping role. The pumping chambers are guarded by non-return valves so that the blood can only pass in one direction. Blood returns to the heart from the body tissues

through the veins. The veins join together to form two large vessels, one from the upper and the other from the lower part of the body.

The blood from these vessels drains into the upper chamber (right atrium) of the heart. It then flows into the lower chamber on the right side (right ventricle) and is pumped into the pulmonary artery and to the lungs. This is a vital step in the circulation as the passage of blood through the lungs allows carbon dioxide to be exchanged for oxygen. The blood returns to the heart in veins which drain into the upper chamber on the left (left atrium). From there it passes into the pumping chamber on the left (left ventricle). It is pumped into the major artery of the body which has many branches distributing blood to all parts of the body.



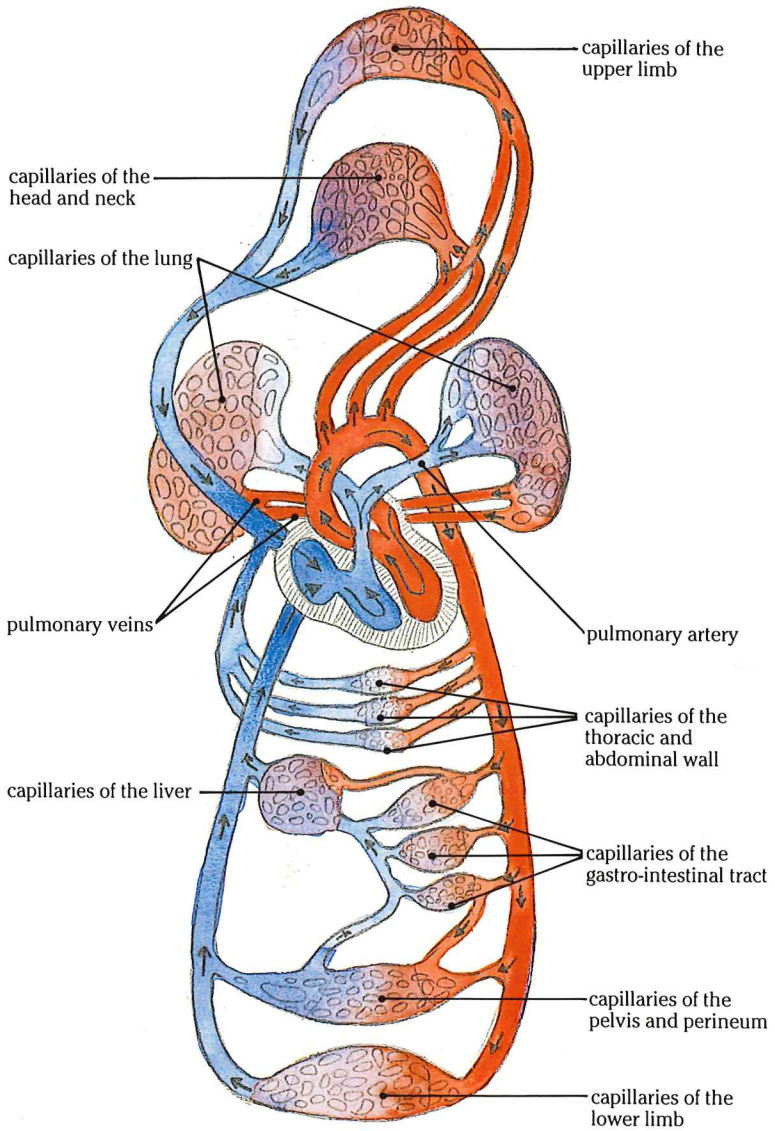
20.2 The heart (showing the direction of blood circulation)

The heart pumps by contracting and squeezing blood out through the blood vessels. It then relaxes and fills with more blood. The pumping action of the heart is felt as a pulse in various locations. The heart or pulse rate is influenced by the volume of fluid in the circulatory system, by chemical changes in the blood and by nervous reactions. Veins carry blood toward the heart while arteries carry it away from the heart. No exchange of gases, food or waste products occurs through the walls of arteries or veins. The exchange of these substances between the circulatory system and the walls of the body can only occur across the wall of capillaries. Capillaries are tiny vessels whose walls are only one cell thick. They provide the connection between the arteries and veins, thus completing the circulatory system.

Blood

Apart from its transport function, the blood contains many components that prevent and fight infection. Its main components are:

- red cells which carry oxygen and carbon dioxide
- white cells which combat infection. The number of white blood cells increases whenever the body is under attack from infection
- platelets which are involved in the clotting process — this is vital in the control of bleeding
- plasma — the fluid component of blood.



20.3 The circulatory system

The nervous system

The nervous system controls every conscious and unconscious action of the body. It may be compared to a sophisticated computer that is able to program itself. There are three major components in the system: the brain, the spinal cord and the nerves.

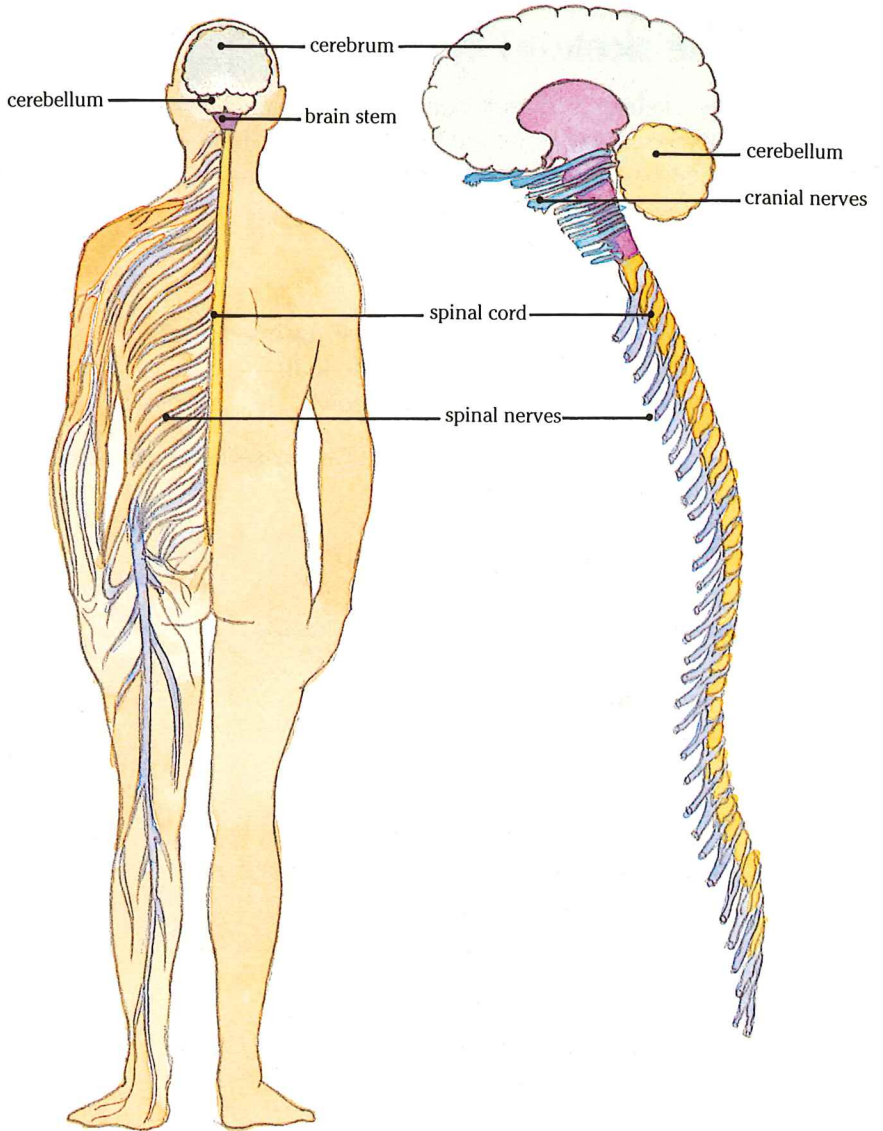
The brain receives messages through incoming or sensory nerves and the special nerves connected with sight, hearing, smell, touch, pain, temperature and balance. It then decides on a course of action and sends commands to various parts of the body through outgoing or motor nerves.

Some body functions continue without conscious effort on our part. The autonomic nervous system controls these through the involuntary muscles of:

- breathing
- the heart and blood vessels
- the bowel
- the glands
- other organs.

The spinal cord is composed of tissue similar to that in the brain. It leaves the under surface of the brain through an opening in the base of the skull. The signals which make contact with the muscles, skin and other organs travel along the nerve tracts which are contained in the spinal cord. These tracts carry information (sensory) to the brain and messages (motor) to the muscles and other tissues of the body.

Whenever the passage of information is interrupted, e.g. if the spinal cord is damaged or a nerve is cut, there is no access for messages to or from that part of the body to the brain. If this damage is in the neck region, the casualty can be paralysed from the injury site down.



20.4 The nervous system

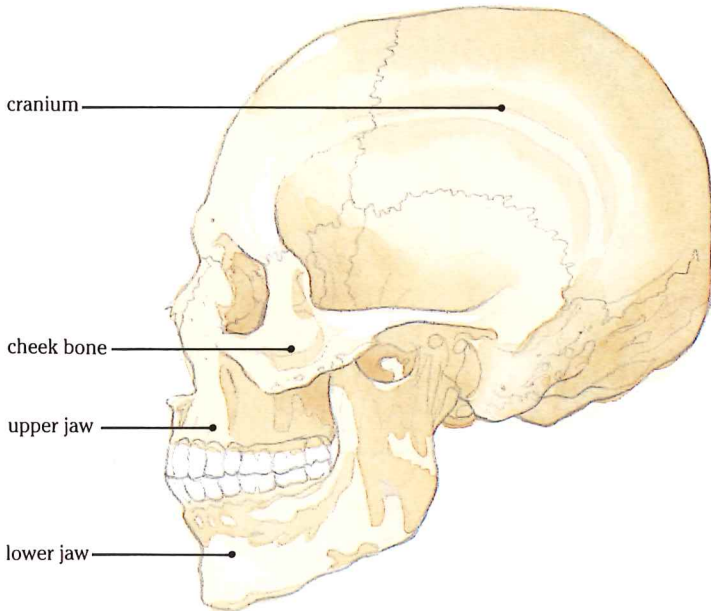
The skeletal system

The skeletal system forms a strong framework for the body. Bones combine remarkable strength with lightness and have the added benefit of being able to repair themselves. Inside bones is bone marrow, which makes blood cells.

The skeleton

- gives shape to the body
- allows movement (muscles pull against bones)
- protects vital organs (ribs and skull)
- makes blood cells (bone marrow).

The skeleton can be divided into three sections: the skull, the trunk and the limbs.



20.5 The skull

The skull

The skull consists of:

- the cranium
- the bones of the face.

The cranium is made up of a number of bones that have fused together to hold and protect the brain. There are several openings in the skull through which blood vessels and nerves enter and emerge. A large opening at the base of the skull permits the spinal cord to connect with the brain.

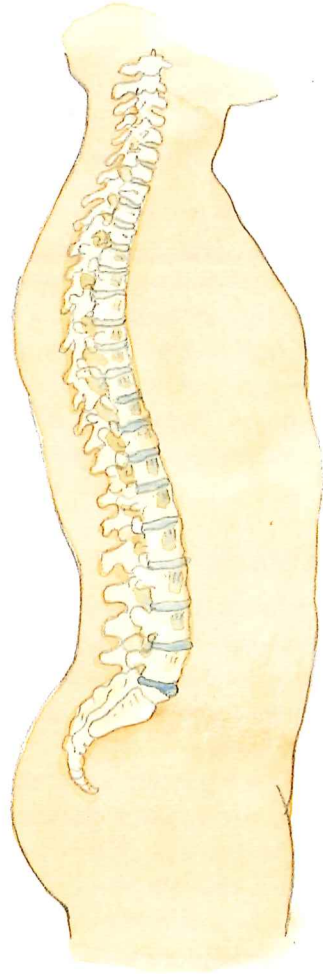
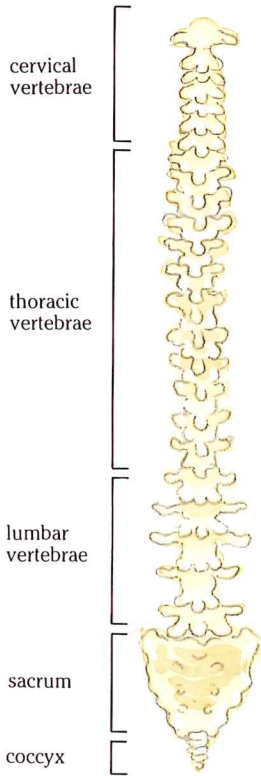
The bones of the face are the upper and lower jaw and two cheekbones. These support the muscles that are used in chewing, swallowing and speaking.

The trunk

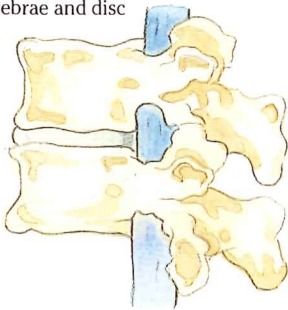
The spine is a strong, flexible pillar which supports a number of structures of the body. It also carries the nerves which branch out to every part of the body. There are 33 bones (vertebrae) in the spinal column. Flexible discs between the vertebrae absorb sudden shocks.

The chest is formed by the backbone and 12 pairs of ribs which curve from the backbone round toward the centre of the chest. At the front of the chest is the breastbone, to which the upper ten ribs are attached on each side. The other two pairs of ribs, which do not join the breastbone, are called floating ribs. The rib cage protects the heart and lungs and helps in the process of breathing.

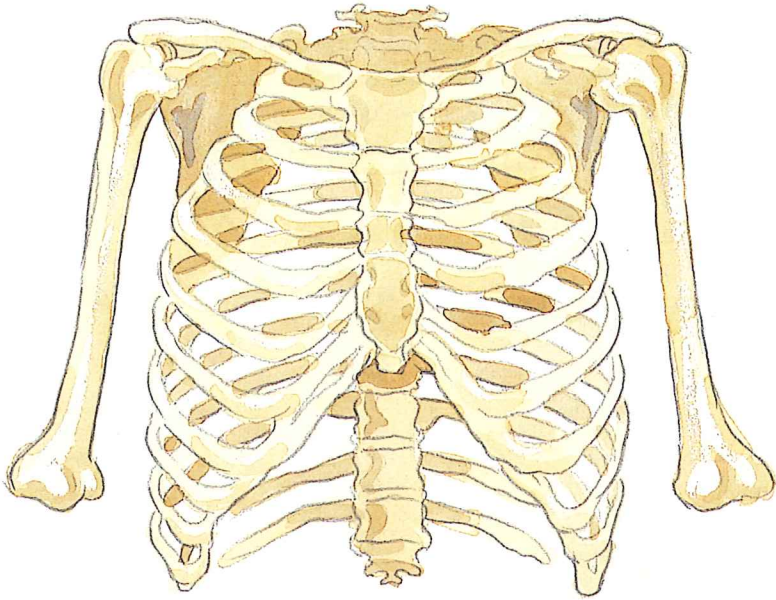
The abdominal and pelvic cavities are enclosed by the lower spine behind, the diaphragm above and abdominal muscles and the pelvis on the sides and front. They contain the major digestive organs, the spleen, the reproductive organs in the female, and the urinary system.



spinal cord,
vertebrae and disc



20.6 The spine



20.7 The chest, shoulders and arms

The limbs

The skeletal framework of the limbs has several parts.

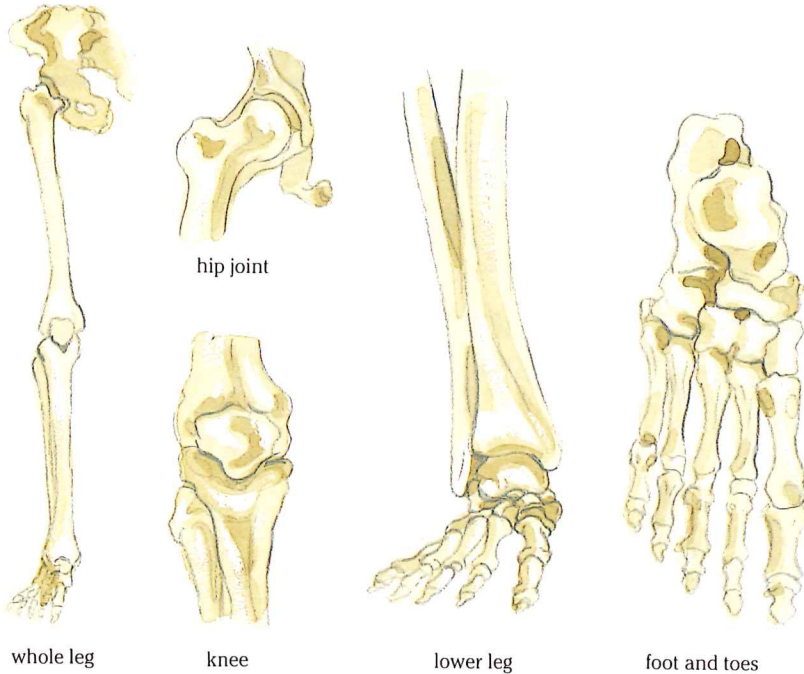
The shoulder blade has a socket into which the upper arm is fitted. This ball socket arrangement allows for maximum mobility but with no loss of stability. As a result this joint is prone to dislocation.

The elbow and wrist are hinge joints. They can only move in one plane and are very stable.

The hand is composed of a series of small bones, which have only a small amount of movement between them and serve to widen the area of grip.

The fingers each have a series of joints which allow the fingers to curl and secure the grip. The thumb can also roll round to oppose the fingers, to encircle the object grasped.

The pelvis is a series of large flat bones fused together with sockets on either side for the ball of the thigh bone. The hip joint is a ball and socket joint similar to the shoulder but is more stable because of a deeper socket and stronger muscles.



20.8 The lower limbs

The lower leg consists of two bones to give attachment to large strong muscles that move the knee and ankle joints. These are hinge joints.

The foot is made up of a series of small bones firmly bound together for stability and set at right angles to the ankle to give a long, broad weight bearing surface.

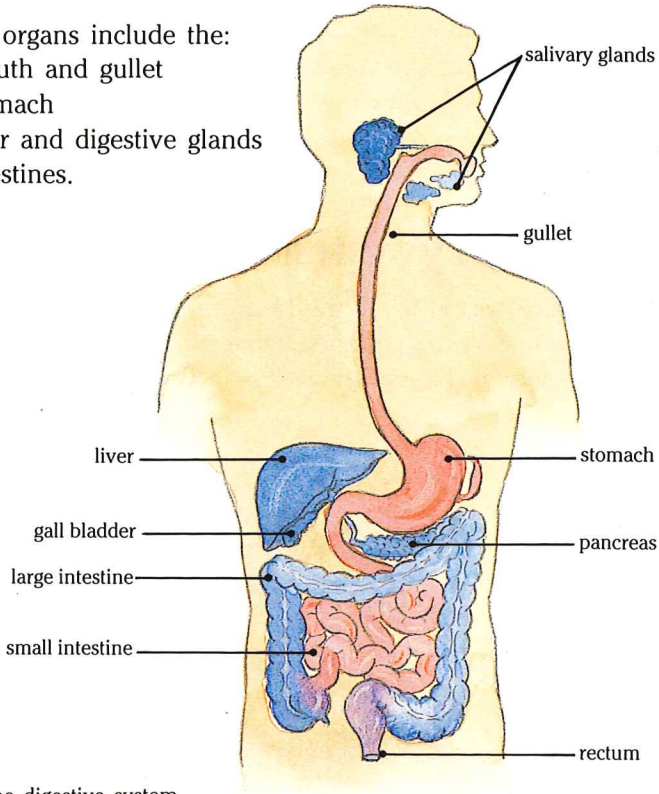
The toes each have a number of small joints, which allow them to curl and give added grip.

The digestive system

The digestive system is responsible for digesting food and converting it into a form that the cells can use. After use, the waste that is left over is compacted and passed out of the body.

Major organs include the:

- mouth and gullet
- stomach
- liver and digestive glands
- intestines.



20.9 The digestive system

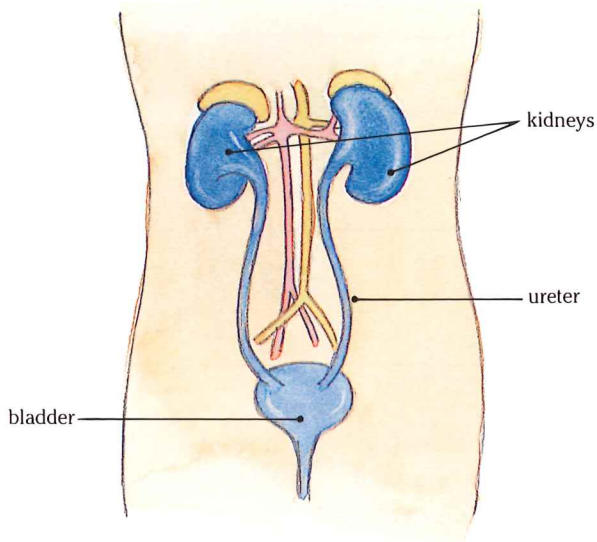
Food enters the digestive system through the mouth, where chewing breaks it into small pieces for swallowing. Chewing also mixes the food with saliva, which contains chemicals that begin the digestive process. The food then travels down the gullet into the stomach, where it is mixed with a strong acid.

The acid turns the food into a semi-liquid form. As food is expelled from the stomach it is mixed with other digestive juices from the gall bladder and pancreas. These juices help to break down the complex structure of the food into simpler forms that the body can use.

As the food travels through the intestines, the useful components are absorbed, particularly through the wall of the small intestine. Some of these are used immediately. Others are stored as body fat, protein and carbohydrate, for future use.

The urinary system

The urinary system filters the blood and removes excess fluid and poisonous wastes collected by the blood from the body. The major organs in this system are the kidneys and bladder.

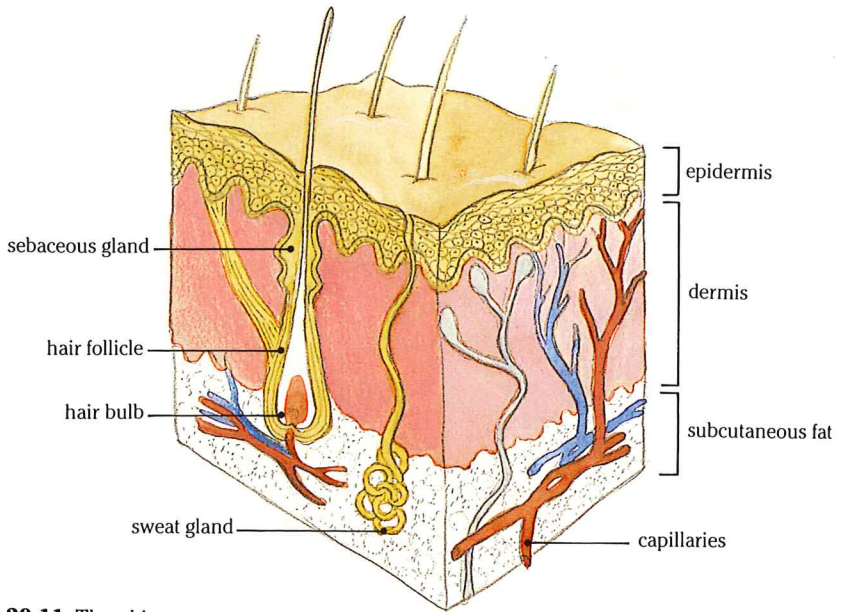


20.10 The urinary system

Blood enters the kidneys and is filtered by the tissues inside them. The waste products are extracted, and pass down a tube called the ureter. They collect in the bladder until there is sufficient quantity for elimination. The waste products are known as urine.

The skin

The skin is a waterproof cover designed to protect the body's cells from damage, drying out, infection and from temperature changes. It is liberally supplied with special nerve endings that transmit sensations of touch, temperature and pain. Sweat glands open onto its surface, and sebaceous glands provide a protective oily substance for the skin.

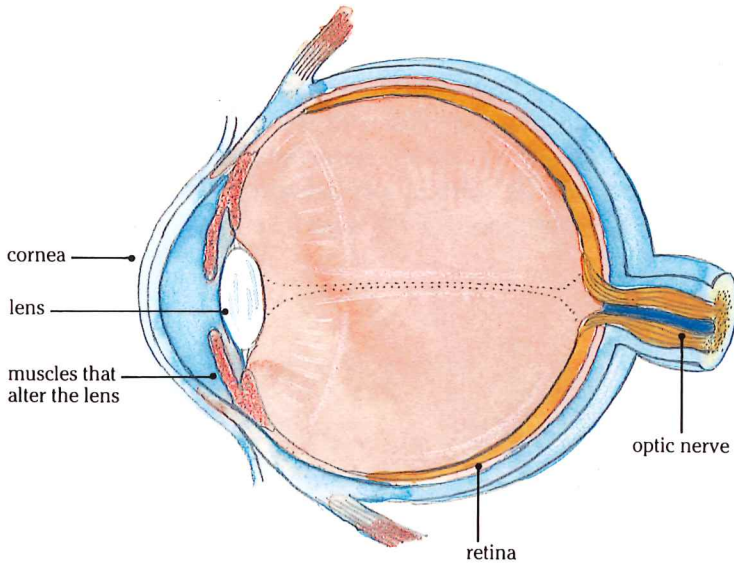


20.11 The skin

The eye

The eye, by receiving light, transmits sensations to the brain which allow us to see the world around us.

Light passes through the cornea and is focused by the lens on the retina. Special receptors are present in the retina which receive the light impulses and then transmit the information along the optic nerve to the brain.



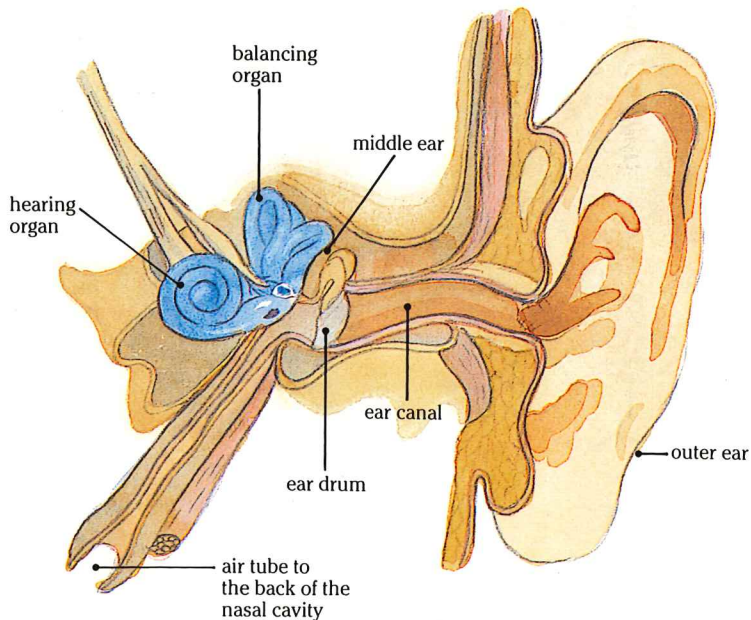
20.12 The eye

The ear

The ear consists of two major parts: the outer ear which is visible and the middle and inner ear, a complex system that allows us to hear and maintain our balance.

Sound entering the ear canal causes the ear drum to move, which in turn causes a series of small bones in the middle ear to move. By these means the vibration is transmitted to the inner ear where special receptors in the hearing organ secure the impulses and transmit them to the brain. This enables us to hear.

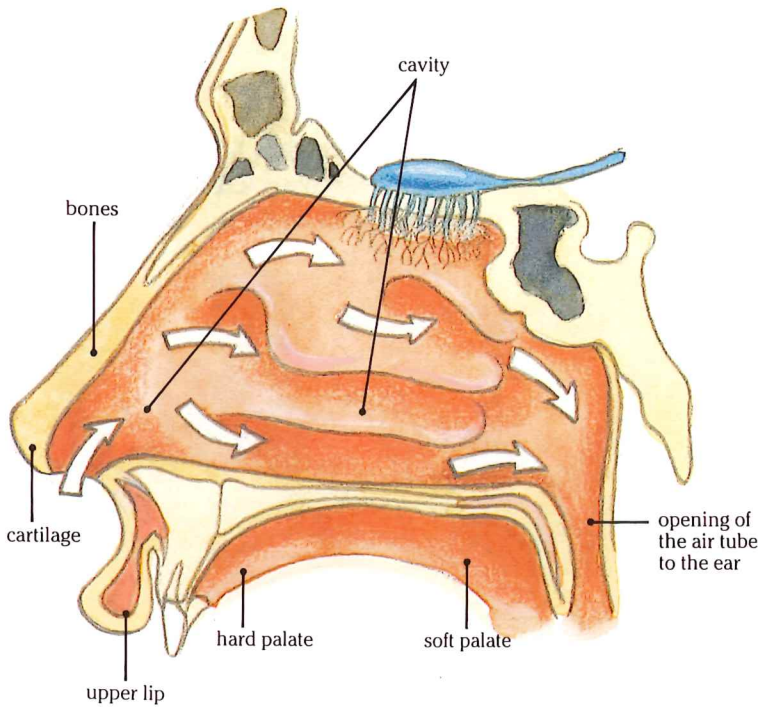
There is also a balancing organ which is filled with fluid. Any movement is detected by special receptors which relay the information to the brain and allow us to maintain balance.



20.13 The ear

The nose

Besides providing the sense of smell, the nose is also a part of the airway. It has a rich supply of blood vessels particularly on the septum, which divides the nasal cavity. This is the area from which bleeding most commonly occurs.



20.14 The nose

21

Drug and alcohol abuse

Accidental drug abuse

Deliberate drug abuse

Drugs are substances that exert a special effect on cells or tissues, or on the body as a whole. They may be extracted from plants or animals or made from chemicals. Some drugs are very useful and are prescribed to relieve pain, promote recovery, and maintain a state of health. Other drugs have no known beneficial use. All drugs are harmful when misused. The misuse and abuse of drugs, either accidental or deliberate, can result in a life-threatening situation.

Drug misuse may be:

- accidental, e.g. when a confused elderly person takes too much of a drug, or takes the wrong dose
- deliberate, e.g. for social reasons, or by a person wishing to commit suicide.

'Side effects', the unintended effects of taking a drug, are generally not serious, and usually represent a person's special sensitivity to a drug's normal action. However, in some cases, the effects may be life-threatening, e.g. when penicillin is given to a person sensitive to it, or when drugs are taken in combination with alcohol or other drugs.

Accidental drug abuse

Causes

Elderly people may be confused and take multiple doses of their prescribed medicine without realizing they have done so. The risk of such an accident is increased if:

- a repeat prescription is dispensed and the new supply of drugs opened before the current supply is used up
- containers are changed
- taking more than one drug, and medication is labelled without specific directions

- people are unaware of the purpose for which each drug is prescribed.

Children are at risk because they may:

- mistake medication for lollies or cordial
- experiment with drugs without knowing the risks.

Prevention

- store drugs and alcohol in a safe, childproof cupboard
- only administer prescription drugs to the person for whom they were prescribed
- when obtaining prescription drugs from a pharmacist, ensure that you understand the instructions provided
- before taking any drugs, always read the instructions on the label carefully
- do not drink alcohol when taking drugs
- do not store drugs for future use. Get a new prescription, when needed. Unused drugs should be disposed of properly. Return them to a hospital or pharmacy. They may be burnt or flushed down the toilet. Drugs may damage a septic tank system
- if caring for elderly people at home, dispense correct quantities of tablets, pills, or liquids — do not leave the containers on the patient's bedside cupboard or dressing table.

Effects

The effects of accidental drug misuse will depend on the substance or combination of substances taken, and the person's individual tolerance and reaction.

Management

- seek medical aid urgently
- for further information, contact the Poisons Information

Centre. The phone number is listed in any Australian Telecom Directory

- where the casualty is fully conscious, induce vomiting by giving Syrup of Ipecac to drink, according to the instructions on the bottle. Do not give salt or soapy water to drink
- keep the casualty comfortable
- keep a sample of vomitus (about 100 millilitres) in a covered jar to be sent with casualty to hospital
- keep a sample of drug for identification.

Deliberate drug abuse

Attempted suicide

Studies show that in most reported cases of attempted suicide the attempt is not serious but takes the form of a 'cry for help' from an emotionally disturbed person. However, you must treat each case as being a possible life-threatening incident.

Social use and abuse of drugs and alcohol

This is the most common form of drug abuse. The immediate pleasure of intoxication appears to be rewarding, even if the reward is short-lived and followed by unpleasant consequences.

Drug taking may temporarily provide:

- pleasurable sensations
- peer group approval
- escape from tension
- risk-taking excitement.

People with very disturbed lives may become psychologically addicted and difficult to treat, even if the drug does not cause physical addiction.

Substances used to induce intoxication

- alcohol
- prescription drugs, including sedatives, tranquillizers, anti-histamines, appetite suppressants, stimulants (amphetamines), some cough mixtures and pain killers
- non-prescription drugs, including opiates (such as heroin), synthetic opiates (such as methadone), marihuana or marihuana resin (cannabis), cocaine, hallucinogens (such as mescaline), some plant seeds and fungi
- inhaled volatile solvents, including petrol, thinners, glue, ether.

Effects

The dangers of these drugs are:

- the direct effects to the person
- the social effects.

The direct effects may be:

- immediate and life-threatening:
 - severely depressed breathing
 - unconsciousness
 - low blood pressure
 - irregular heartbeats
 - vomiting and inhalation of vomitus
- delayed:
 - damage to the kidneys, liver, lungs, brain
 - infections including hepatitis
 - addiction
 - withdrawal effects including seizures and acute confusion.

The social effects may include:

- accidents, e.g. drowning, road accident
- antisocial behaviour, e.g. aggression, violence, theft to maintain the habit

- family disruption
- problems at work, e.g. absenteeism, reduced efficiency.

Prevention and help

Federal and state health authorities, and support services such as Alcoholics Anonymous, publish information and maintain counselling and treatment services for the victims of drug abuse. See the Telecom directory for further information.

22

The emotionally disturbed casualty

Emotional disturbance

Emotional reactions

Neurotic illness

Psychotic illness

An altered emotional state may appear as an acute illness affecting the casualty's physical and mental health. If you encounter a casualty whose behaviour, conversation or emotional state varies from the normal, you should:

- recognize that there is some emotional disturbance
- prevent the condition from becoming worse
- seek expert medical aid and not attempt to intervene where the casualty is uncooperative, dangerous or self-destructive.

Emotional disturbance

Emotional disturbance refers to any action by the casualty that is:

- uncontrolled
- self-destructive
- violent to other people or objects.

It also refers to states in which the casualty may:

- be suffering from an emotional outburst (hysteria)
- have false beliefs, e.g. that someone is trying to poison or harm him or her
- hear sounds and see objects which are not present (hallucinations)
- be confused and disoriented about place and time
- be depressed and anxious
- be withdrawn and unable to communicate
- be obsessive in behaviour.

Emotional reactions

Emotional reaction is the most common form of emotional disturbance, and is normal in most circumstances. Stress may be

brought about by domestic situations, work and financial problems, and may lead to drug and alcohol abuse. All members of the community are stressed at some time. However the extent and duration of the emotional reaction may lead to the casualty becoming extremely distressed.

Causes

- pain and injury
- fright
- distress after an accident
- grief over death or injury
- stress in response to a personal problem
- excitement.

Prevention

Following an accident, fright, injury or death, you should anticipate an emotional reaction. Offer reassurance, and be concerned, quiet and helpful, until the casualty is assisted by medical aid.

Recognizing emotional disturbance or reaction

- observe the scene and the casualty, noting:
 - any physical signs of outburst, e.g. smashed objects
 - distressing sights, e.g. an accident scene, a victim
 - a letter, or some other form of communication giving bad or unexpected news
- check with bystanders, relatives and the casualty to find out what has happened.

Symptoms and signs

- palpitations
- pins and needles in fingers and toes

- rapid shallow breathing
- crying
- shouting, screaming and thrashing about
- epileptic-like seizure (but the casualty never loses control of the bladder or becomes injured).

Management of an emotionally disturbed person

- reassure the casualty, with a calm, firm, and friendly manner
- remove the casualty from the situation
- sit or lay the casualty down
- if the casualty's breathing is rapid and shallow, instruct him/her to breathe slowly
- if rapid shallow breathing is accompanied by pins and needles and spasms in the fingers and toes, instruct the casualty to breathe in and out of a paper bag until the symptoms disappear
- check for injury
- observe and record the:
 - state of awareness
 - respiration
 - pulse rate
- if the symptoms do not quickly subside and/or there are injuries, seek medical aid
- if the symptoms subside quickly and there are no injuries, medical aid is not necessary. Do not leave the casualty alone.

Neurotic illness

A neurotic casualty suffers from a nervous or emotional disorder but remains mentally in contact with reality.

Symptoms and signs

- headaches
- indigestion
- shakiness
- impaired memory
- exaggerated complaints of an injury or illness
- the casualty appears tense, agitated, depressed and withdrawn.

Management

- reassure the casualty and handle gently, but be positive and firm
- be a sympathetic listener
- advise the casualty to seek medical aid. If the problem appears to be acute, seek medical aid.

Psychotic illness

Psychotic casualties have a severe disorder of the mind, often associated with a loss of contact with reality. They can be self-destructive, violent and homicidal. Some drugs can produce psychotic symptoms in a normal individual.

Symptoms and signs

- violence
- extreme agitation or excitement
- accusations of persecution
- hallucinations.

Management

- always ensure that you would be able to avoid injury if the casualty became violent
- seek medical aid urgently. Once aid has been summoned remain with the casualty
- if the casualty is violent, send for police
- provide tactful handling and persuasion until medical aid arrives
- remove discreetly all objects that could be used for attack or suicide
- sometimes you may need to use physical restraint but restrict this to casualties who:
 - become actively suicidal
 - are dangerous to others
- never apply excessive force. In most cases, physical force should be left to the police.

23

Sports injuries

Abdominal injuries

Air pressure changes

Ankle sprains

Chest injuries

Corked thigh

Eye injuries

Facial injuries

Finger injuries

Fractured nose

Groin and testicle injuries

Head injuries

Knee injuries

Muscle injuries

Shoulder injuries

Soft tissue injuries of the neck

Spinal injuries

Stress fractures

Tennis elbow

Winding

Prevention

Most sports injuries can be prevented if the athlete:

- trains adequately before competing
- is fit to perform the sport
- is playing at his/her own standard
- wears and uses correct equipment
- does not resume sport until fully recovered from a previous injury.

Casualty assessment



- DRABC
- assess injuries as soon as they occur, not at the end of the event
- carefully assess the injury before moving the casualty
- never remove a casualty with a spinal injury from the field until medical aid arrives.

Management of sports injuries

The sports injuries described in this chapter are listed in alphabetical order for easy reference.

Abdominal injuries

Abdominal injuries are rare in sports, but can be caused by a blow to the abdomen, or by high speed impact, e.g. in surfing.

Always remember that the vital organs (spleen, liver and kidneys) can be injured. Check for signs of internal bleeding. Any casualty with continuing abdominal pain must seek medical aid immediately.

Air pressure changes

Air pressure changes that occur during SCUBA diving and sky diving can result in life-threatening injury.

Prevention

- adequate preparation and training
- adherence to safety procedures.

Effects

- rupture of the eardrum
- rupture of the air sacs of the lungs
- acute facial pain
- decompression sickness ('bends') including nitrogen bubbles forming in the blood. This may be life-threatening
- arterial gas embolism — air bubbles forming in the blood as a result of a ruptured lung. This may be life-threatening.

Management

- DRABC
- seek urgent medical aid
- information on first aid management is available from the Diving Emergency Service — phone (008) 088200.



Ankle sprains

Ankle sprains result in rupture of the fibres of the ligaments on either side of the joint. There is always a possibility of fracture of the bones that form the ankle. However, the first aider will usually not be able to identify this.

Symptoms and signs

- pain, which may be quite intense and will also cause restriction of movement and loss of function
- tenderness
- swelling
- bruising.

Management

- RICE
- manage as for a fractured ankle
- seek medical aid.

Chest injuries

Rib cage (ribs and muscles) injuries commonly occur in football and surfing, and from direct blows in any sport. Cramping in the muscles of the rib cage or diaphragm is called a 'stitch'.

Symptoms and signs

- pain over the injured area
- cramping in the rib cage area
- sometimes, shoulder tip pain, which can be caused by injury to the abdominal organs below the diaphragm
- breathing difficulty
- gasping attempts to breathe.

Management

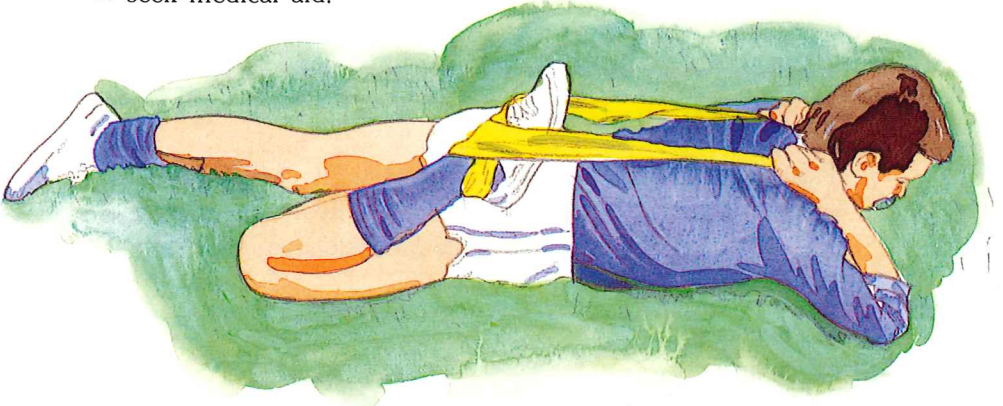
- ask the casualty to breathe deeply and to rest
- manage fractured ribs, if suspected.

Corked thigh

This injury is caused by a blow to the front or outer thigh muscles. It results in bleeding into the muscles. The injured area becomes tight and painful as the muscles contract.

Management

- RICE
- stretch the muscle
- seek medical aid.



23.1 Stretching the muscle

Eye injuries

Eye injuries commonly occur when playing squash or tennis. Wearing eye goggles is important, although this may not provide complete protection. All eye injuries are potentially serious. Casualties should be referred immediately to medical aid.

Management

- reassure the casualty
- lay the casualty on the back
- place a light dressing over both eyes, ensuring there is no pressure on the injured eye. The casualty may become disoriented when both eyes are covered
- ask the casualty not to move the eyes
- if the casualty needs to be moved, this should be done gently with the casualty lying flat
- seek urgent medical aid.

Facial injuries

Facial injuries occur mostly in contact sports, especially if face guards are not worn. These injuries may involve the eyes, nose and teeth, and may include facial lacerations and fractures.

Management



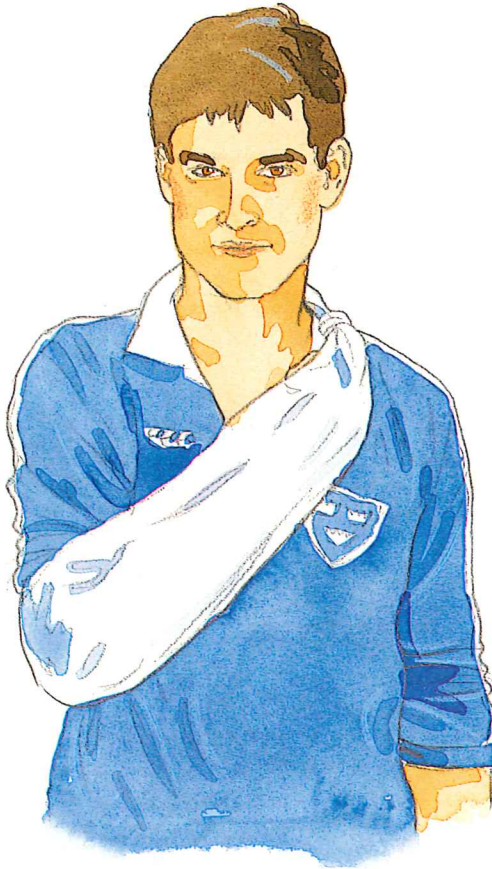
- DRABC
- if the casualty is unconscious, ensure a clear, open airway
- control bleeding
- manage any wounds
- seek medical aid.

Finger injuries

Finger injuries may occur as a result of a blow, or the finger being stretched out of normal position. They often occur in hard ball or body contact sports, e.g. cricket, football, judo.

Management for fractured fingers

- DRABC
- rest the injured hand on a well padded splint and secure with a bandage
- elevate the hand for as long as possible
- during transport, support the hand in a St John sling
- seek medical aid.



23.2 Supporting an injured hand

Dislocated fingers or thumbs

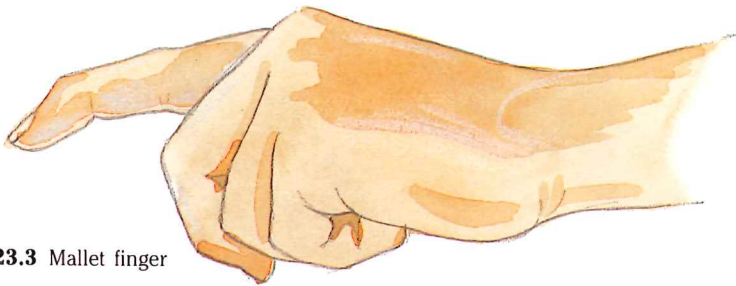
Dislocated fingers or thumbs may be caused by over-extension, over-flexing or twisting. The joint may be completely or partially dislocated. In complete dislocations, inability to move the joint and deformity are usually obvious. In partial dislocations, deformity may not be obvious and some degree of movement may be possible.

Management

- elevate the hand
- seek medical aid
- do not attempt reduction.

Mallet finger

This is a deformity of the finger due to a rupture of the tendon, or a chip fracture of the base of the end bone.



23.3 Mallet finger

Symptoms and signs

- pain
- swelling
- tenderness
- the end of the finger lies in a flexed position and cannot be extended by the casualty.

Management

- immobilize and support with the finger splinted straight
- seek medical aid.

Contusions

Contusions may occur under a finger or toe nail when blood collects beneath it, following a blow or crush injury.

Symptoms and signs

- pain and throbbing at the end of the finger
- blood collecting beneath the nail
- heat around the injured area
- tenderness at the finger tip.

Management

- apply ice packs
- seek medical aid.

Fractured nose

The bones in the nose may be broken, with accompanying bleeding. This injury commonly occurs in body contact sports, e.g. boxing, karate.

Management

- manage bleeding — this may be difficult
- seek medical aid urgently.

Groin and testicle injuries

These can occur as a result of a direct blow or by overstretching muscles of the groin or upper thigh. The injury will be associated with severe pain. The testicles should be protected if playing hard ball or body contact sports.

Management of groin injuries

- apply ice packs
- seek medical aid.

Management of testicle injuries



- DRABC
- rest and reassure the casualty
- lay the casualty on the back with knees slightly bent and supported by a folded blanket, or in a position of comfort
- ask the casualty not to pass urine
- seek medical aid.

Head injuries

Head injuries commonly occur in body contact and vehicular sports.

Management



- DRABC
- observe the casualty carefully and ensure that he/she rests
- seek medical aid if there is any loss of consciousness
- advise the casualty to seek medical advice before returning to sport.

Knee injuries

Knee injuries are common in sport. Immediate first aid shortens recovery time and limits swelling.

Management

- RICE
- where necessary, manage fractured knee cap
- seek medical aid urgently.



23.4 Managing a knee injury

Muscle cramp

Cramps are spasms or abnormal contractions of muscles, caused by:

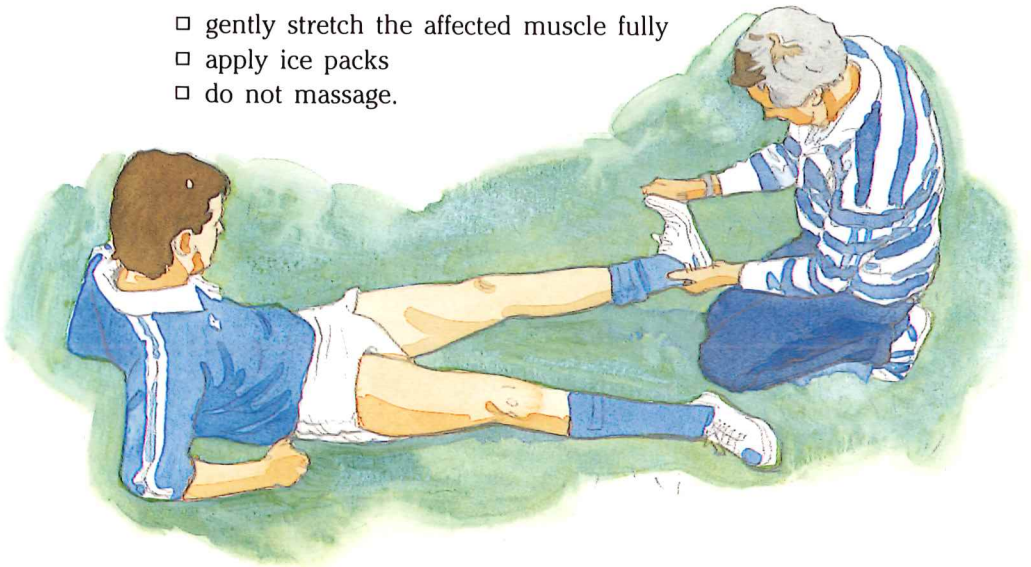
- overuse
- excessive jarring
- a small tear
- loss of body salts and fluids as a result of excessive sweating
- poor blood supply to the area, e.g. because clothing is too tight.

Symptoms and signs

- pain
- inability to use the muscle
- stiffening of the muscle as it shortens and contracts.

Management

- gently stretch the affected muscle fully
- apply ice packs
- do not massage.



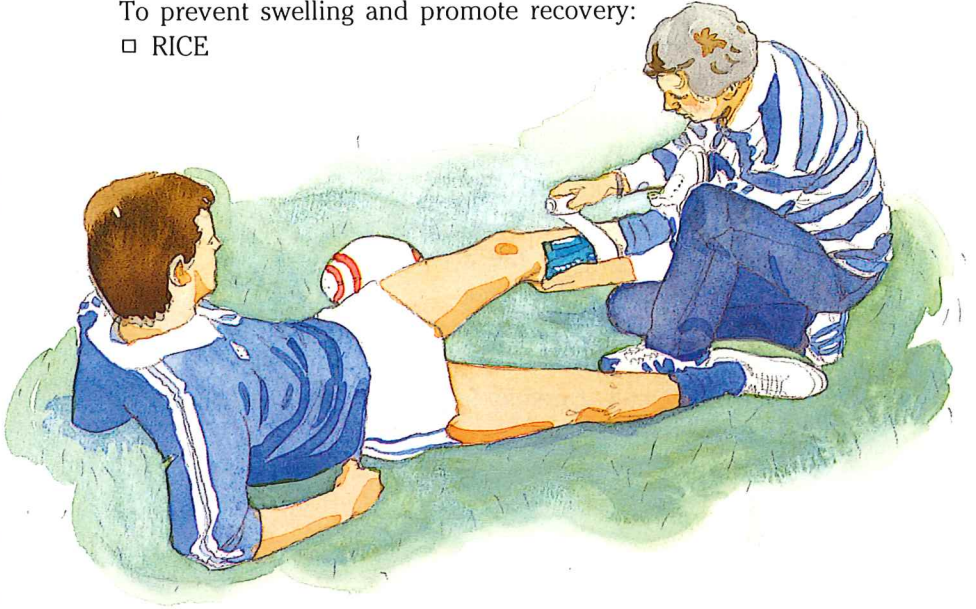
23.5 Managing a muscle cramp

Muscle injuries

Management

To prevent swelling and promote recovery:

- RICE



23.6 Managing a muscle injury

Shoulder injuries

Management

All shoulder injuries should be managed as a fracture or dislocation:

- support the shoulder in a St John sling
- apply ice packs
- seek medical aid.

Soft tissue injuries of the neck

These injuries are often associated with bruising. Swelling can result in airway obstruction, leading to a lack of oxygen, unconsciousness and death.

Management



- DRABC
- if the casualty is conscious:
 - sit the casualty up
 - loosen clothing about the neck
 - apply ice packs to the neck
- support the neck using a cervical collar, firmly rolled towel or a roll of newspaper
- observe the casualty carefully for airway problems or signs of internal bleeding
- seek medical aid urgently.

Spinal injuries

These commonly occur in body contact sports, e.g. football, and in diving. If it is necessary to move the casualty, great care should be taken. If available, a Jordon frame or a scoop stretcher should be used.

Stress fractures

Repetitive overuse can cause a stress fracture (breakdown within the interior of the bone). This most commonly occurs in the long bones of the foot and the kneecap.

Symptoms and signs

- pain and tenderness at the site.

Management

- manage as for a fracture
- seek medical aid.

Tennis elbow

Tennis elbow is a strain of the muscles and tendons at the elbow. It is a result of overstress from overuse, and may be chronic. It occurs in many sports, e.g. tennis, javelin throwing and baseball.

Symptoms and signs

- pain over the bone at the side of the elbow joint, usually the outer side. Pain is made worse by contracting or stretching the muscles attached to that bony point
- tenderness over the same part of the elbow.

Management

- apply ice packs to the elbow
- rest the arm in an arm sling
- seek medical aid.



23.7 Managing tennis elbow

Winding

Causes

- a blow to the upper abdomen.

Symptoms and signs

- gasping, ineffectual attempts to breathe
- chest is not moving
- casualty has a wide, open mouth.

Management

- help the casualty into a comfortable position that assists breathing
- do not pump the legs or massage abdominal wall, as this may cause further damage if serious injuries are present
- seek medical aid.

24

Emergency childbirth

Infection

**Preparing for emergency
childbirth**

The first stage

The second stage

Immediate care of the baby

The third stage

Dealing with the umbilical cord

Care of the mother

If you are required to assist a childbirth when medical aid is not available, remember that you should allow the birth to occur naturally, with as little interference as possible.

Infection

Infection is a serious danger to both the mother and the baby. It is essential that you take the following precautions to minimize the risk of infection:

- scrub your hands and nails thoroughly with warm water and soap
- allow your hands to dry in air
- repeat the procedure if your hands contact non-sterile material
- if you have an infectious disease (such as a cold) wear a mask — improvise with a clean handkerchief if necessary
- wear gloves if available.

Preparing for emergency childbirth

- prepare a suitably clean surface for the mother using (if available):
 - a large sheet of plastic to place under the mother
 - a clean sheet over the plastic
 - a towel or second sheet ready to place for the baby
 - tissues or toilet roll to clean any soiling from the bowel
- sterile cord ties, e.g. string or linen tape (25 cm long) that has been boiled for 10 minutes, if possible
- sterile scissors to cut the cord if necessary
- cotton wool swabs or a clean soft cloth to wipe the baby's face

- a blanket and sheet folded into three (top to bottom) to cover the top half of the mother's body
- sanitary pads for the mother (disposable nappies are a good substitute)
- several bunny rugs or warm woolly jumpers to wrap around the baby
- towels
- a suitable container (e.g. garbage or laundry bag) for disposal of material contaminated by blood or body fluids.

The first stage — onset of labour

The first stage of labour usually lasts from 6 to 24 hours, allowing ample time to seek medical aid. However, a woman who has already had a child may progress through the first stage very rapidly.

Symptoms and signs

- usually, cramp-like pains in the lower abdomen, occurring every 10–20 minutes and lasting 15–30 seconds
- usually, a 'show' of bloodstained mucus, followed later by the 'waters breaking'.

Management

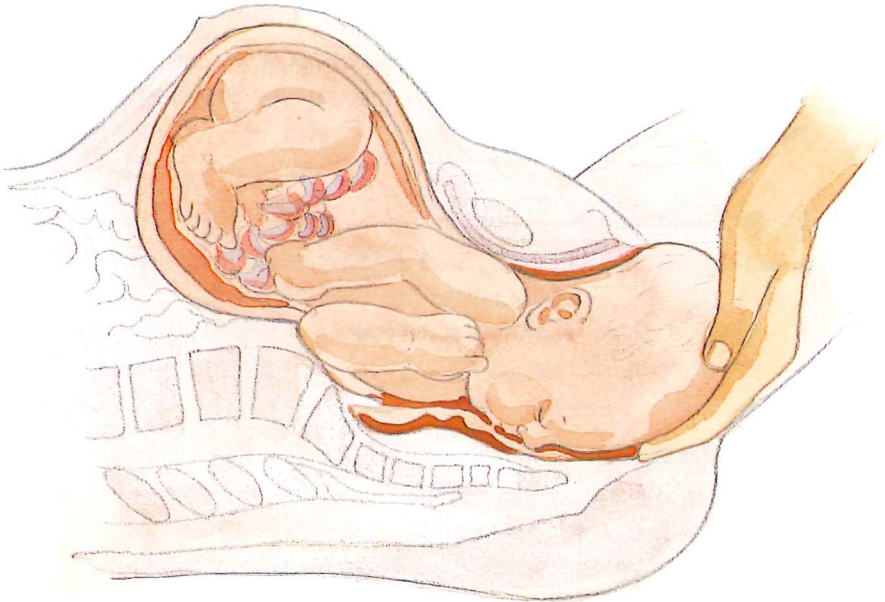
- reassure the prospective mother
- seek medical aid
- if medical aid will be delayed, begin to collect the requirements listed above.

The second stage – birth

This stage begins when the birth canal is fully dilated and ends with the birth of the baby.

Symptoms and signs

- contractions which occur every 2–3 minutes, or more frequently and last 1–1½ minutes
- a change in the nature of the contractions to ‘bearing down’ pains
- bulging of the perineum, with the baby’s head visible
- an increase in the flow of bloodstained mucus
- the mother may want to have a bowel movement. **Do not** let her sit on the toilet.



24.1 Second stage of labour

Management

- seek medical aid urgently
- if in a public place, ensure privacy
- help the mother adopt a comfortable position not flat on her back
- wear gloves if available
- wash and dry your hands thoroughly
- wash the area between the entrance to the vagina and the anus with soap and water, if available, or just warm water, moving from front to back to prevent contamination of the birth area
- encourage the mother not to hold her breath and push, but to keep her mouth open and pant.

Normal delivery with head presenting first:

- control the baby's head with gentle but firm pressure to prevent it from being born too quickly. The head will appear with the face towards the mother's anus, but will then rotate to face one side
- check whether the cord is around the baby's neck
- if the cord is around the neck, free it by easing it carefully over the baby's head if at all possible. If not, apply two ties to the cord, using string (or bootlaces), and then cut between the two ties
- support the baby's head in the palms of your hands and wait. The next contraction delivers the baby's shoulders
- during the next contraction, hold the baby under the armpits and lift up towards the mother's abdomen.

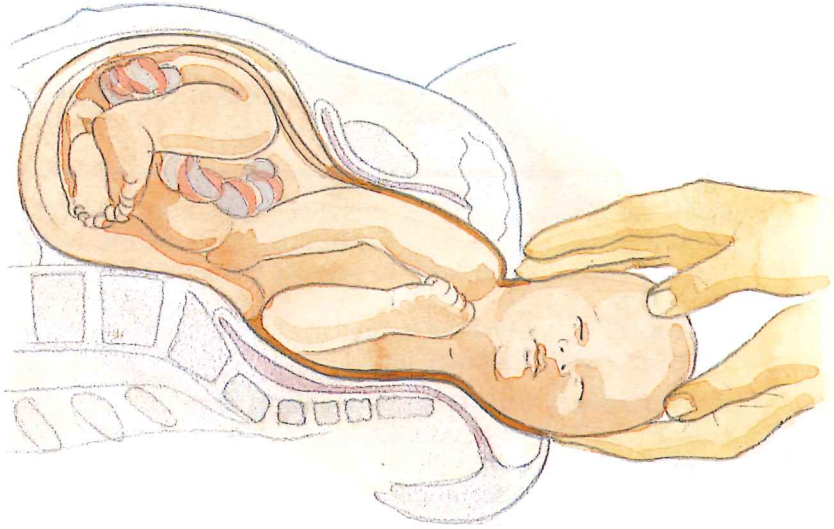
Delivery with buttocks or foot presenting first:

- place the mother in a position such that the baby can be delivered below the genital area
- allow the mother to push the baby out herself, but guide the baby so that the back remains uppermost
- after delivery of the shoulders, wait one minute, then elevate the baby and control the delivery of the head by gentle but firm pressure on the head.

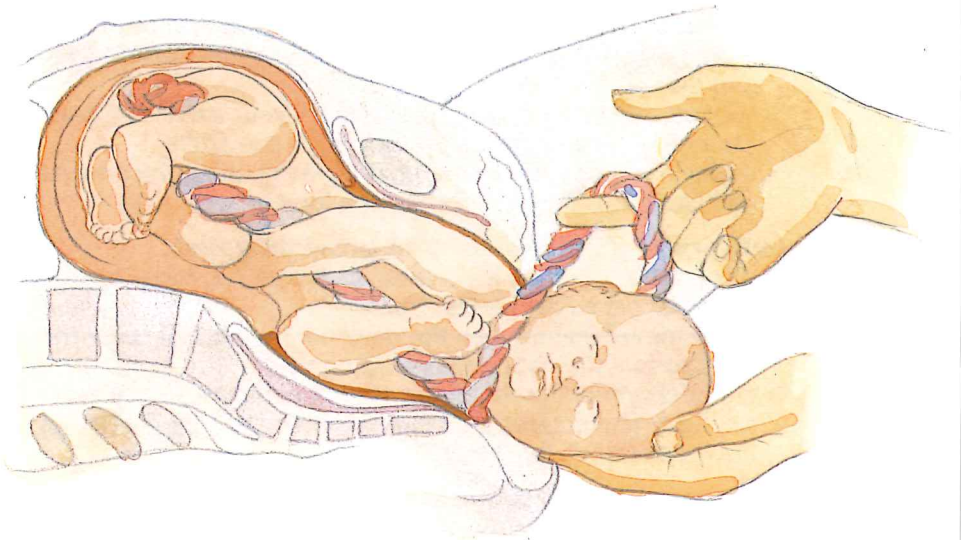
Delivery with cord presenting first:

- place the mother on her left side with her head down and buttocks upwards
- proceed as for normal delivery.

a



b



24.2 a-b Delivery of the baby

Immediate care of the baby

- the baby will be wet and slippery. Take care not to drop it or pull on the cord
- dry the baby quickly but thoroughly. Use a fresh, warm cloth to wrap the baby, and keep it warm
- place the baby on its side to allow fluid to drain from its mouth and nose – on its mother's abdomen is ideal
- the baby will probably let you know that it is breathing (e.g. it will cry). Let it remain on its mother's abdomen (again, be careful not to pull the cord, which will still be attached to the placenta) and keep both mother and baby warm
- if the baby does not cry or show signs of breathing after 1 minute, check the heart rate: if there is no pulse follow the DRABC Action Plan. If a pulse is present, observe for a further minute and follow the DRABC Action Plan.

DRABC

Warning: in all cases of emergency childbirth, seek medical aid urgently.



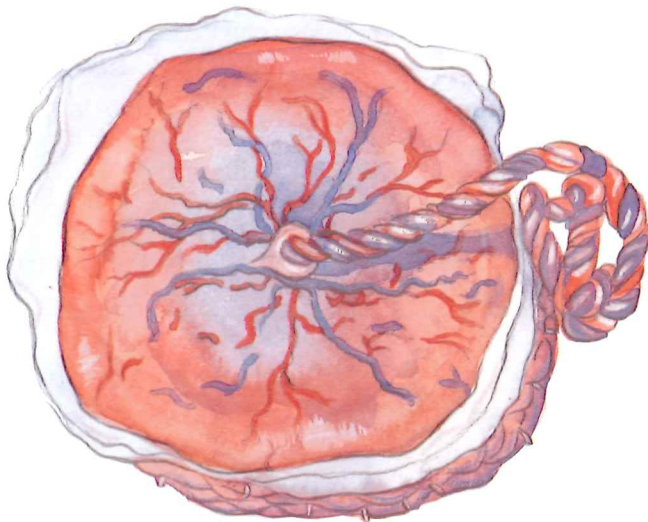
24.3 Immediate care of the baby

The third stage

The placenta (afterbirth) will be expelled by contractions of the uterus. The cord should be tied (see p. 57) before the delivery of the placenta.

Management

- the placenta may not be delivered until 10 or more minutes after the birth of the baby
- help the mother into a comfortable position, as for the birth
- do not pull on the cord — this may cause excessive bleeding
- if the cord is long enough, encourage the mother to put the baby to her breast. This will help the uterus to contract, expelling the placenta and controlling bleeding
- after delivery of the placenta, there will normally be enough blood flow to fill a sanitary pad every five minutes. If the blood is gushing out, or fails to slow down, or if it increases



24.4 The placenta

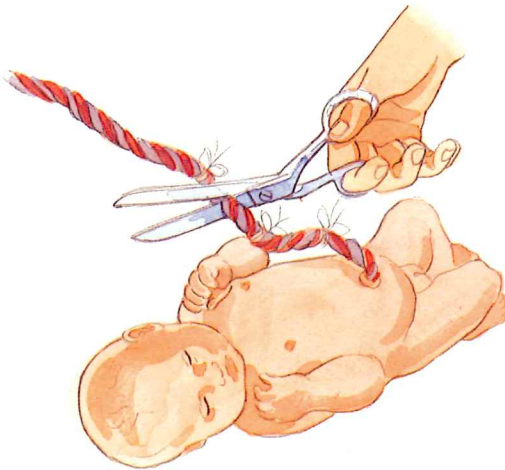
suddenly, seek urgent medical attention. Gentle massage of the mother's abdomen until it becomes firm will help to reduce excessive bleeding

- retain the placenta for medical inspection
- the mother should not be given food or drink until after the placenta is delivered.

Dealing with the umbilical cord

Leaving the cord intact will lessen the risk of bleeding and infection. It will only be necessary to cut the cord if the baby needs to be resuscitated and must be moved away from the mother, or if the birth is in a remote area which is isolated from medical aid

- wait usually 2–3 minutes after the birth of the baby
- tie the cord very firmly in three places — 10 centimetres, 15 centimetres, and 20 centimetres from the baby's navel. The cord must be securely tied to prevent bleeding after it is cut
- if the cord is cut, leave two ties on the baby's side.



24.5 Dealing with the umbilical cord

Care of the mother

- Wash the mother and help her change any stained clothing
- place a sanitary pad or disposable nappy in position
- give her hot drinks (provided the placenta has been delivered)
- encourage her to rest while waiting for medical aid
- regularly check her respiration and pulse rates
- regularly check for excessive blood loss
- control excess bleeding by gentle massage of the lower abdomen
- place all bloodstained material in a sealed plastic bag; retain used sanitary pads for medical inspection
- clean all surfaces contaminated by blood and body fluids.

25

First aid in remote areas

**Keeping the casualty comfortable
and reassured**

**Observing and recording the
casualty's condition**

**Checking the adequacy of
dressings, bandages and splints**

In remote areas, medical aid may take several hours or longer to reach the casualty. Regardless of where the incident has occurred, the appropriate first aid is that described for specific conditions in *Australian First Aid*. However, the first aider will need to:

- keep the casualty comfortable and reassured
- accurately observe and record the casualty's condition for the information of medical aid. This will need to be done at regular intervals
- regularly check the adequacy of dressings, bandages, splints etc.

The more serious the casualty's condition, the more frequently will these observations need to be made.

Keeping the casualty comfortable and reassured

Position the casualty comfortably. The position will be determined by the casualty's conscious state and injuries.

While waiting for medical aid, the casualty will become more stressed and will require greater support and reassurance. If the casualty's condition deteriorates, do not panic. Keep calm and thereby help reduce the casualty's fear. Remember that you also will have additional emotional stress.

Environmental conditions may be significant. In a cold environment, keep the casualty warm by means of added clothing, blankets, or yourself, if necessary. In a hot environment, keep the casualty shaded and out of direct contact with the sun. Loosen clothing.

Apply the first aid skills you have learned in the management of the casualty.

Observing and recording the casualty's condition

Make regular observations and record the casualty's:

- conscious state:
 - has it improved or deteriorated?
 - record the time of any changes
- pulse:
 - is the rate fast or slow?
 - is the rhythm regular or irregular?
 - is it weak or strong?
 - count the rate over 1 minute and record
- breathing:
 - is the rate fast or slow?
 - is it deep, shallow or sighing?
 - is it noisy, quiet or gurgling?
 - count the rate over 1 minute and record
- pupils:
 - are they dilated or contracted?
 - are they equal or unequal?
 - do they react to light?
 - record the time of any changes
- skin colour:
 - is it normal or pale?
 - is it bluish or purplish?
- skin condition:
 - is it wet or dry?
 - is it warm or cold?

When observing skin colour and condition, remember that this may refer to a part of the body or the whole body, e.g. an extremity beyond an injury may be pink, white or blue. This indicates the state of the circulation of that limb, particularly when the extremity feels warm or cold.

The observations you will need to make are determined by the casualty's injuries and condition. If the casualty has a simple lower limb fracture, and is conscious and alert, it is not so important to note conscious state, pulse, breathing and pupil changes. However, it could be vital to observe and record colour and condition of the toes on the injured limb.

Remember that the casualty's condition may deteriorate. Close observation of the casualty will help you recognize these changes early.

Checking the adequacy of dressings, bandages and splints

- inspect the dressings to see whether blood has soaked through. If so, add further dressings if necessary. Make sure the dressings are sufficiently tight
- check any fracture immobilization for firmness of bandages. If loosened, apply a firm bandage over the initial bandage
- check the circulation of the limb. If it is impaired and the extremity is pale, cold and painful, remove the bandage and reapply.

26

More on first aid equipment

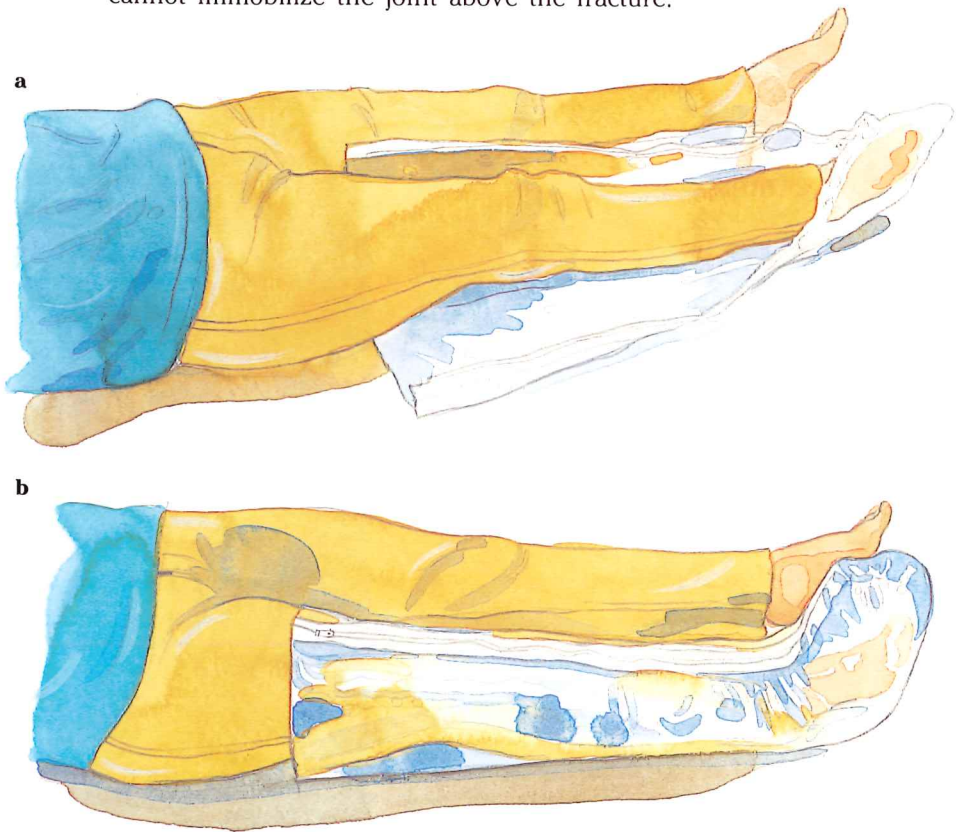
Air splints

Traction splints

Air splints

Air splints consist of a double walled plastic tube with a valve in the outer wall for inflation. The splint is usually fitted with a zip slide fastener to make application easier.

Inflatable air splints, correctly applied, are a quick and effective means of immobilizing limb fractures. They are not recommended for fractures of the thigh or upper arm because they cannot immobilize the joint above the fracture.



26.1 a-b Applying an air splint

Advantages

- easy to apply
- control swelling and reduce bleeding
- the fracture area and limb can be observed
- removal for x-ray is not necessary because air splints do not obscure the limb.

Application

- select an appropriate sized splint to immobilize the joints above and below the fracture site. If you do not have a sufficiently large air splint, use an alternative method of splinting
- apply the splint directly to the skin when possible, except if open wounds are present. It may be applied over clothing if folds and wrinkles have been smoothed out
- if the casualty has long nails, cover them with a cloth to prevent puncture of the splint
- straighten a limb deformed by fracture with gentle traction. Apply the splint while traction is maintained. Check the pulse in the limb when straightening. If it is absent or disappears, do not straighten
- inflate the splint until it can be indented by firm thumb pressure
- the amount of air pressure required in the splint is largely determined by the casualty, who, if conscious, should experience a feeling of comfort and support when the splint is adequately inflated. If pain is not relieved, check that the splint is sufficiently inflated and that the circulation of the limb is not impaired.

Warnings: if inflated too tightly, an air splint can restrict the circulation in the limb. It must be inflated only until it can be indented by firm thumb pressure.

Cover the entire hand or foot, without leaving fingers or toes protruding.

Because gas expands when heated or with rising altitude, the air pressure in an inflatable splint must be adjusted when there are changes in these conditions. This is to ensure that there is adequate circulation in the injured limb.

Never leave a casualty who has an air splint in place in sunlight. Air pressure builds up, and magnification through the plastic can cause a burning sensation to the injured limb.

An air splint should not be used when the circulation of the injured limb has been or is likely to be affected.

Care must be taken when storing inflatable splints to ensure that they are rolled or stored flat, and not folded, as some types may crack at sharp folds.

Traction splints

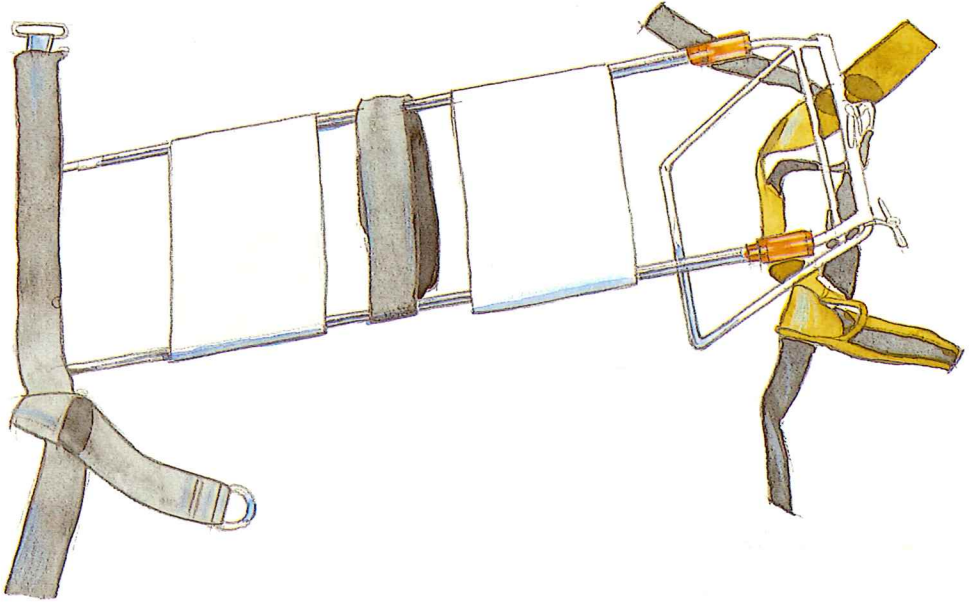
Traction splints are used to immobilize fractures of the thigh and lower leg. Traction on the foot extends the leg, drawing the broken bone into normal alignment and immobilizing the bone ends to prevent further damage. A metal frame extending up the sides of the leg, with leather or canvas straps, holds the leg securely.

Advantages

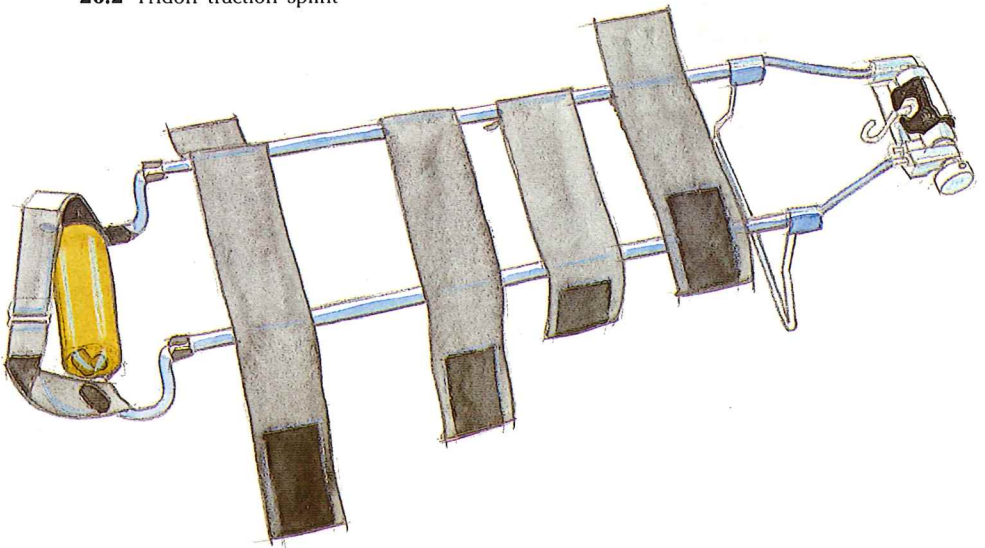
- eases pain
- helps reduce shock
- helps prevent additional damage to nerves, blood vessels, bones and other tissues.

Examples

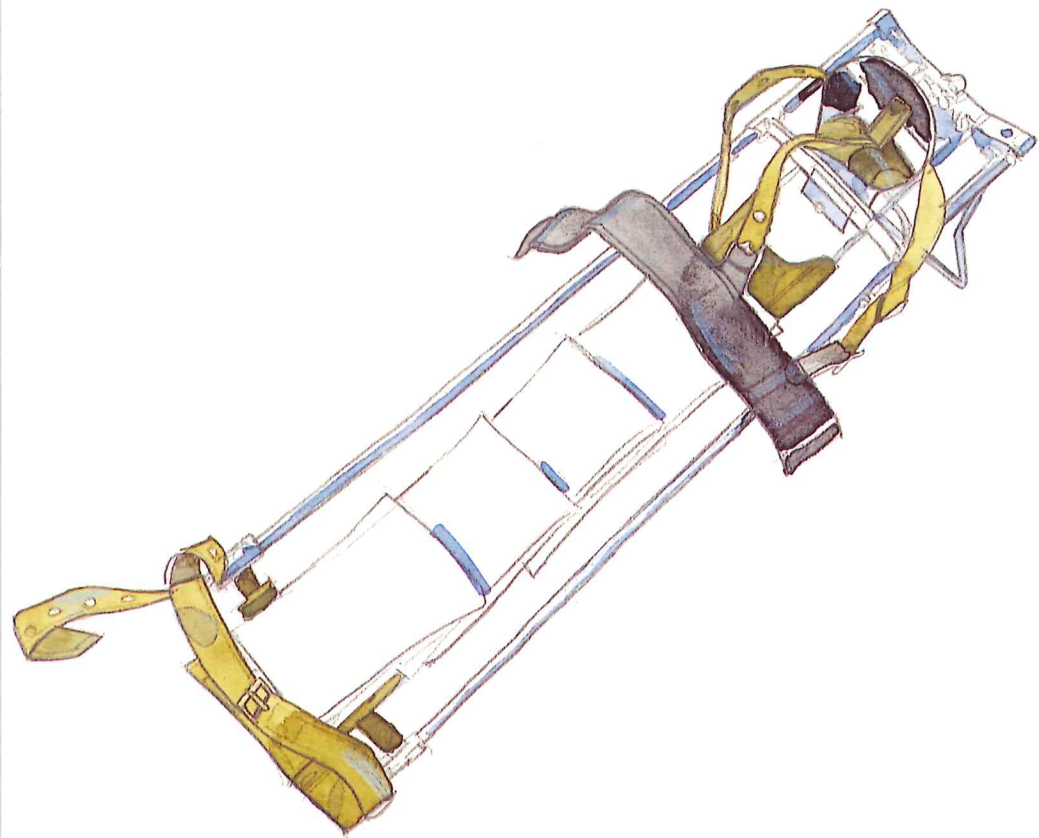
- the Tridon traction splint
- the Hare traction splint
- the modified Thomas splint.



26.2 Tridon traction splint



26.3 Hare traction splint



26.4 Modified Thomas splint

27

Lifting and moving casualties

When to move a casualty

Stretchers

**Transporting a casualty to
medical aid**

When to move a casualty

Unless absolutely necessary, do not move a casualty until medical aid arrives. However, if the casualty's life is endangered, e.g. by fire or the likely collapse of a building, remove the casualty by the quickest means available, regardless of injuries or the manner in which removal must be made. **Do not become a casualty yourself.**

When injuries appear serious or extensive, seek medical aid urgently.

Whilst waiting for medical aid to arrive, ensure that:

- no further danger is apparent
- the casualty has a clear, open airway
- the casualty is breathing
- bleeding has been controlled
- the casualty is safe from further harm.

For a seriously injured casualty, ambulance transport is the preferred method. Improvised transport may endanger the casualty's chance of survival and should be used only if no ambulance is available.

Lifting a casualty

You should aim to:

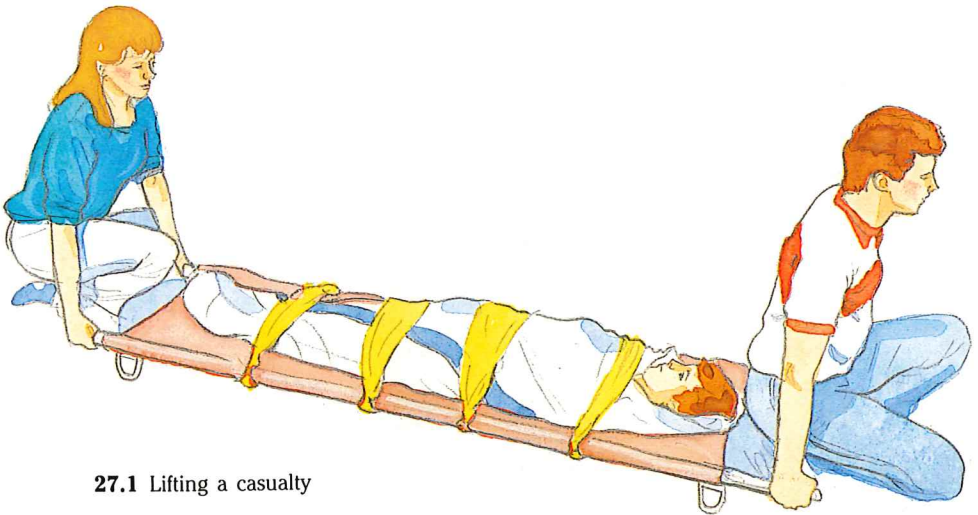
- keep the casualty as comfortable as possible
- prevent any unnecessary strain or injury to yourself
- prevent further injury to the casualty.

Remember:

- DRABC
- manage all injuries and immobilize fractures
- tell the casualty what you are going to do



- seek the casualty's help and cooperation
- ensure that the casualty feels secure
- realize your limitations — if you need help, ask for it
- keep your back straight when lifting
- use your thigh and leg muscles when lifting
- ensure that your feet are on a firm and level surface, if possible
- have your feet parallel and apart when lifting a stretcher, or for a blanket lift
- for handseats, point your feet in the direction of intended movement
- hold the casualty firmly but gently
- avoid risks, where possible.



27.1 Lifting a casualty

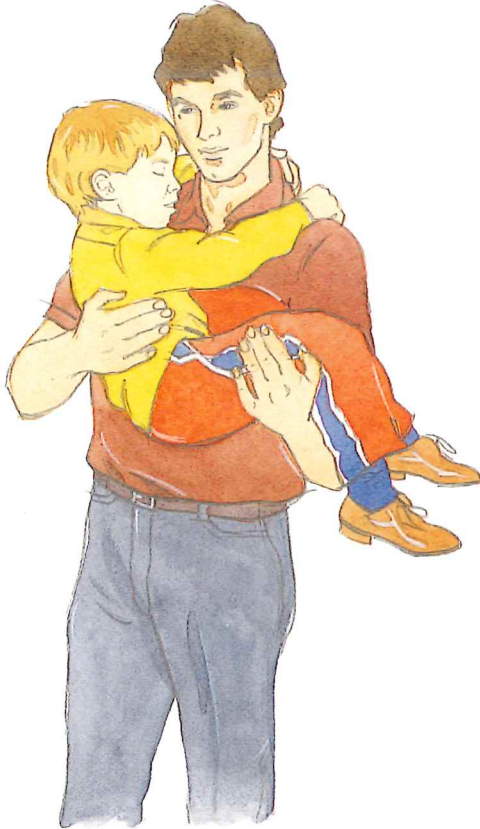
Moving a casualty without assistance

The cradle

Use to carry a child or a light casualty.

Method

- place the casualty's nearer arm around your neck
- pass one of your arms around the casualty's thighs
- place your other arm around the waist
- lift.



27.2 The cradle

Remember:

- if the casualty is heavier than you anticipated, seek assistance
- do not slump forward while carrying the casualty. Arch backwards to counterbalance the weight.

The human crutch

Use for adult casualties when they can walk with assistance.

Method

- help the casualty to stand
- stand at the casualty's injured side and pass your nearer arm behind him/her
- grasp the casualty's clothing near the opposite hip
- place the casualty's nearer arm around your neck
- hold that hand with your free hand. If the casualty can use the other hand, additional support can be gained from a stick or walking aid
- step off together with the inside foot.



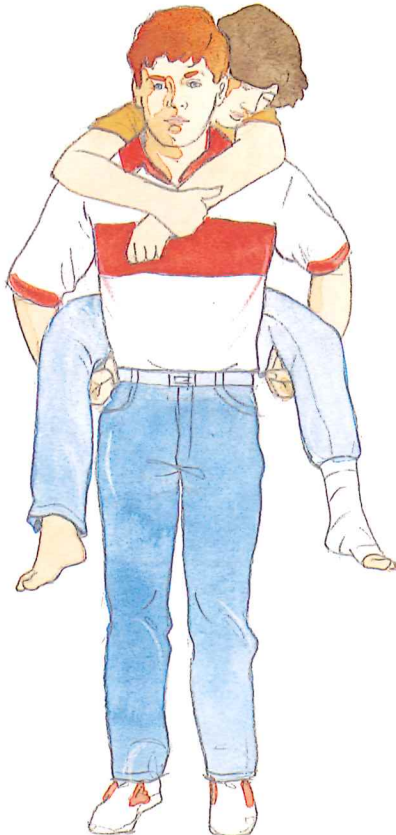
27.3 The human crutch

Pick-a-back

Use for conscious casualties who can hold onto the first aider.

Method

- help the casualty to stand
- stoop in front of the casualty
- have the casualty place his/her arms over your shoulders and clasp them firmly together across your chest
- place your arms under the casualty's knees
- if possible, clasp your hands in front
- straighten and proceed.



27.4 Pick-a-back

The lift and drag

Use to drag a heavy helpless casualty from danger.

Method

- turn the casualty onto the back
- tie the wrists together
- face and kneel astride the casualty
- bend forward and thread your head and one arm through the casualty's arms so that the weight is distributed across your shoulders and back
- lifting the casualty's head and shoulders clear of the ground, crawl on your hands and knees from the danger area.

Warning: never take the casualty's weight solely on your neck.

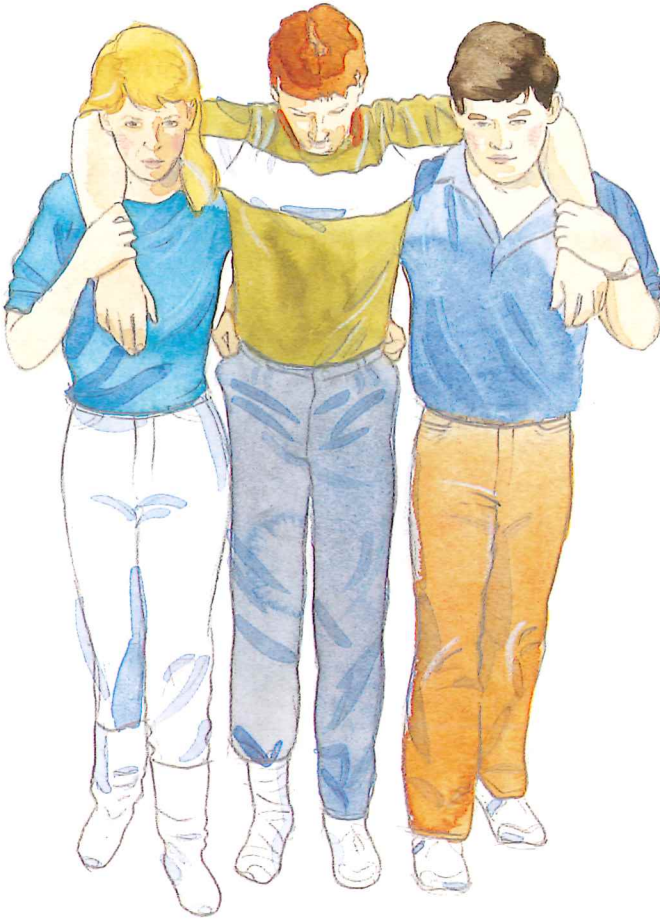


27.5 Lift and drag

Moving a casualty with the assistance of another first aider

The two-person human crutch

Use for a casualty who can support weight on one leg without increasing the injury.



27.6 Two-person human crutch

Method

- help the casualty to stand
- the first aiders should stand on each side of the casualty
- the casualty places arms around both first aiders' shoulders
- each first aider puts the nearer arm around the casualty's waist and grasps the clothing on the casualty's opposite hip
- with the free hand, each first aider grasps the casualty's wrist which is around the shoulder
- each first aider steps off with the inside foot.

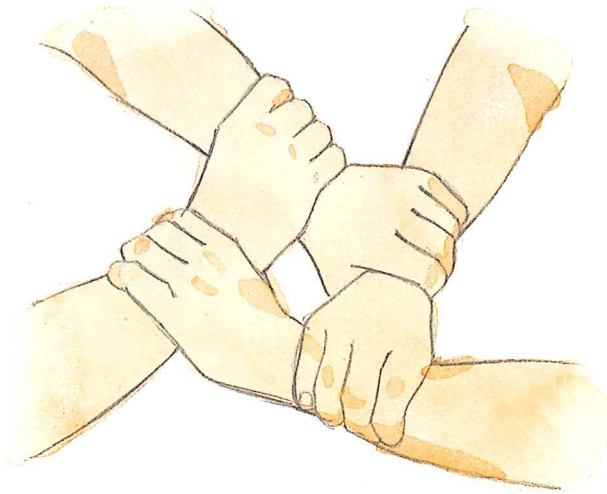
The four-handed seat

Use when the casualty can help, using one or both arms.

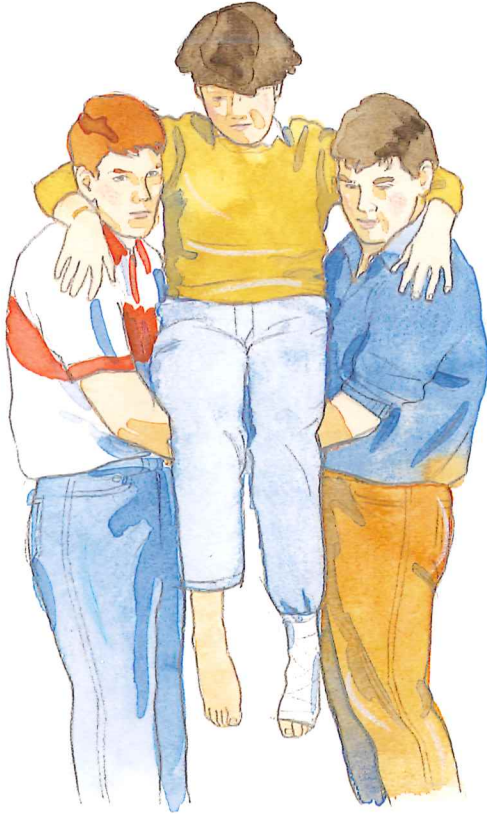
Method

- two first aiders face each other behind the casualty and each grasps his/her left wrist with the right hand, and each other's right wrist with the left hand

27.7a



- both squat down
- instruct the casualty to place one arm around your neck and sit on your hands
- rise together and each step off with the inside foot, using a crossover step.



27.7 a-b Four-handed seat

The three-handed seat

Use for supporting either leg, when the casualty can help, using one or both arms.

27.8a



Method

To support the left leg:

- two first aiders face each other behind the casualty
- the helper on the casualty's right grasps his/her own left forearm with the right hand and the other helper's right forearm with the left hand. This leaves the other helper's left hand free to support the casualty's left leg. The helper on the casualty's left grasps the other helper's right forearm with the right hand
- both helpers should squat down
- instruct the casualty to place one arm around your neck and to sit on your hands
- with the helper on the left supporting the casualty's leg, rise together and each of you step off with the inside foot, using a crossover step.

To support the right leg:

- follow the procedure described above, changing right for left and vice versa.



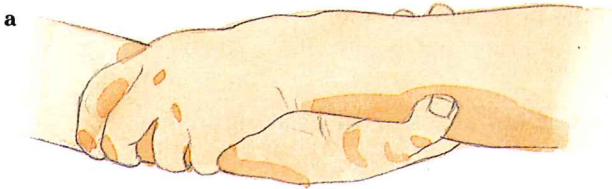
27.8 a-b Three-handed seat

The two-handed seat

Use for any conscious casualty who can be carried in a sitting position. The casualty helps by placing the uninjured leg under the injured one to support it.

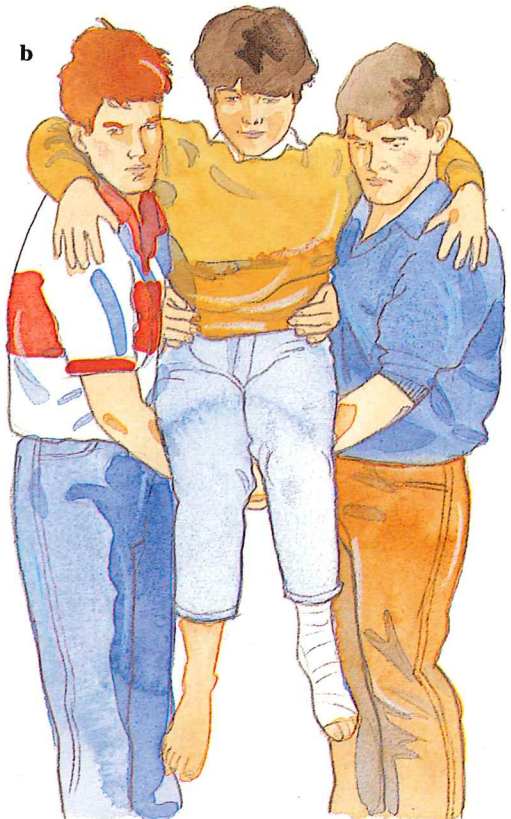
Method

- two first aiders face each other, one on either side of the casualty, with the toe of the outside foot facing the direction of movement
- each places the arm nearer to the rear of the casualty around the casualty's waist
- the other arm is placed under the casualty's thighs at approximately mid-length, and the other first aider's wrist is clasped



- both arise slowly and together, lifting the casualty from the ground
- when upright, each first aider steps off with the inside foot, turning it in the direction of movement.

Remember: the higher the casualty is lifted, the easier carrying will be. The first aiders' arms should not be straight under the casualty's thighs as this makes carrying more difficult.



27.9 a-b Two-handed seat

The fore and aft method

Use when space does not permit the use of a hand seat.

Method

- one first aider stands between the casualty's legs facing the feet
- bending down, he/she grasps the casualty under the knees
- the other first aider stoops behind the casualty and after raising the head and shoulders, passes the arms under the casualty's armpits and grasps the casualty's wrists against the chest
- rise together and step off, walking in step.



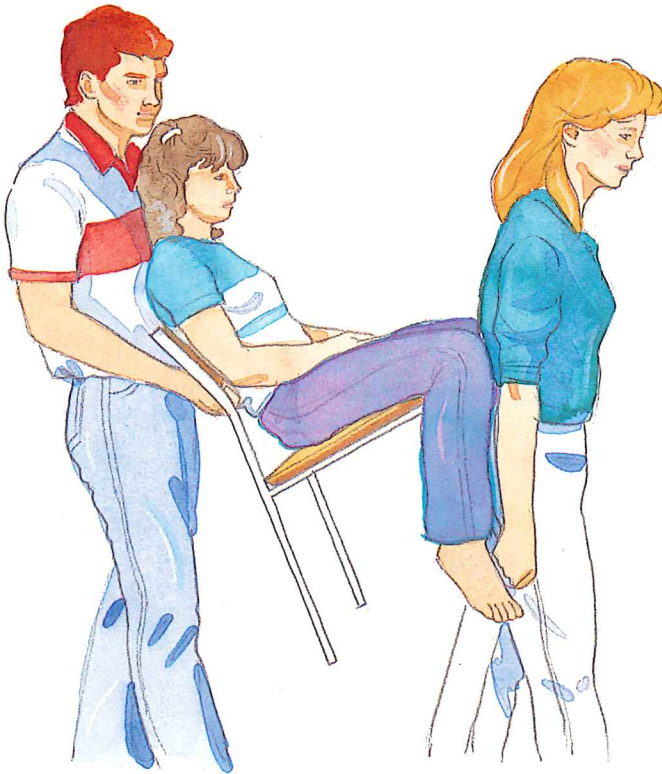
27.10 Fore and aft method

The fore and aft chair lift

Use for a conscious casualty with serious injury, when a chair is available.

Method

- seat the casualty in a strong chair
- one first aider should grasp the back of the chair and tilt it to the point of balance
- the other first aider, with his/her back to the casualty, kneels on one knee and grasps the front legs of the chair
- rise and both proceed in step.



27.11 Fore and aft chair lift

Stretchers

Remember:

- do not move the casualty until medical aid arrives if there is any possibility that transport will adversely affect him/her
- test the stretcher for strength and security before placing the casualty on it
- keep the stretcher as level as possible
- movement must be minimal
- position the casualty on the stretcher correctly, determined by injuries and condition
- if the casualty has a head injury, is unconscious, or is likely to vomit, position him/her on the side on the stretcher
- protect the casualty from prevailing weather conditions
- avoid haste
- fasten the casualty securely to the stretcher.

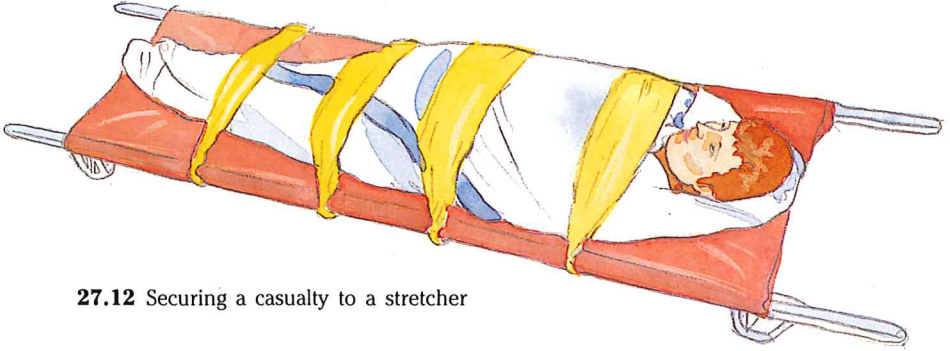
Caring for a casualty with a suspected spinal injury

- avoid pressure on localized areas
- use padding. Sandbags or similar padding may be used to maintain the head in a safe, stable position
- remove coins, keys etc. from the casualty's pockets.

Securing a casualty to a stretcher

- using two broad bandages tied together, secure the casualty at:
 - shoulder level
 - hips
 - mid thigh
 - calves

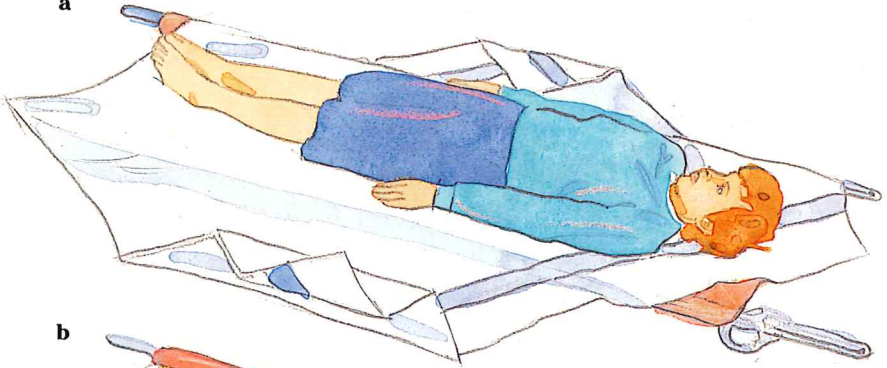
- apply bandages firmly enough to prevent the casualty from moving
- do not allow bandages to make the casualty's injuries worse.



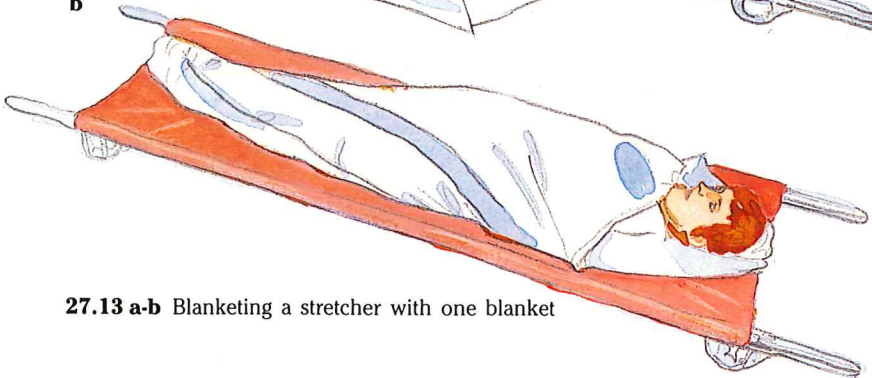
27.12 Securing a casualty to a stretcher

Blanketing a stretcher

a

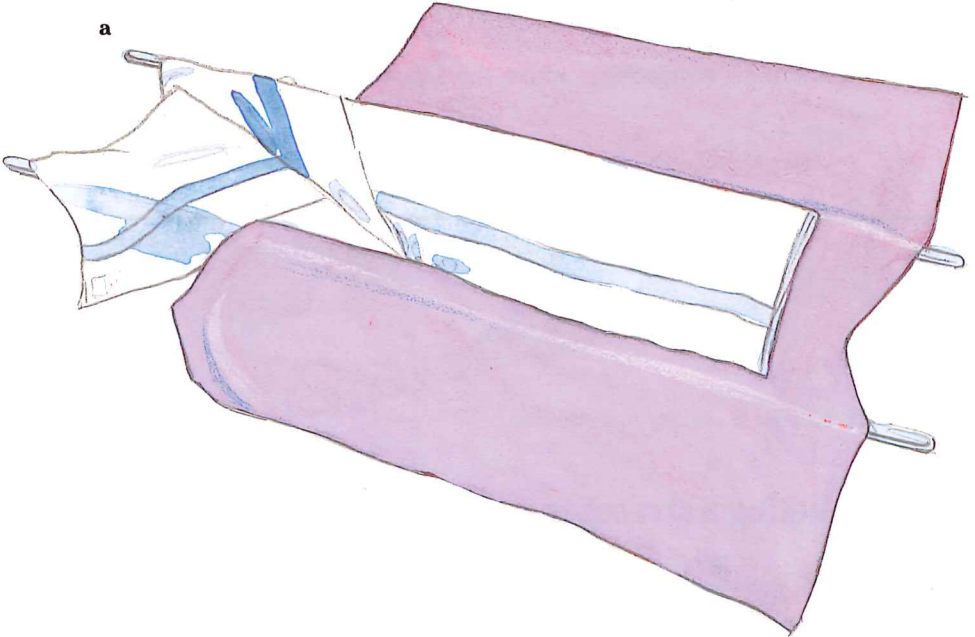


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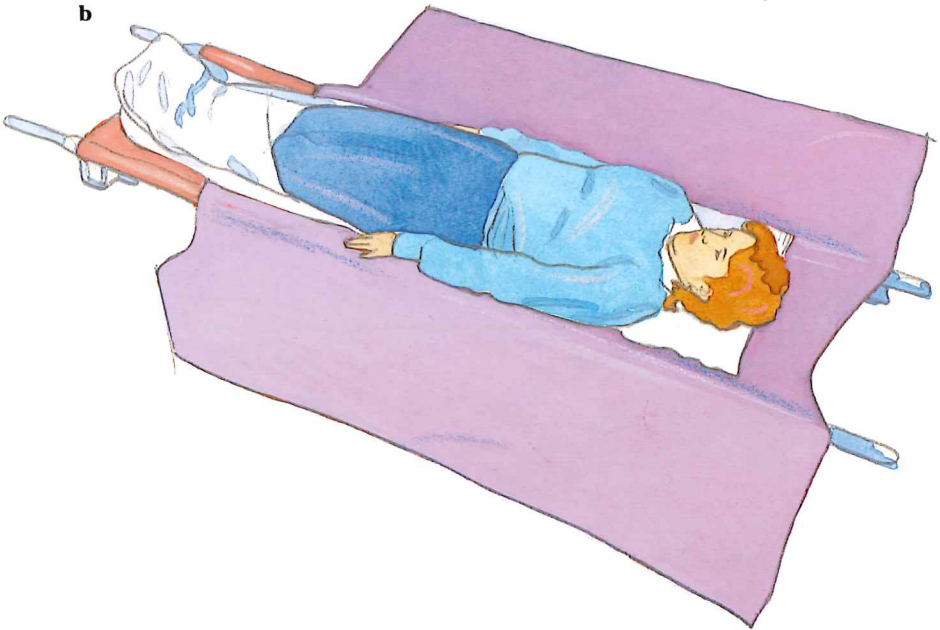


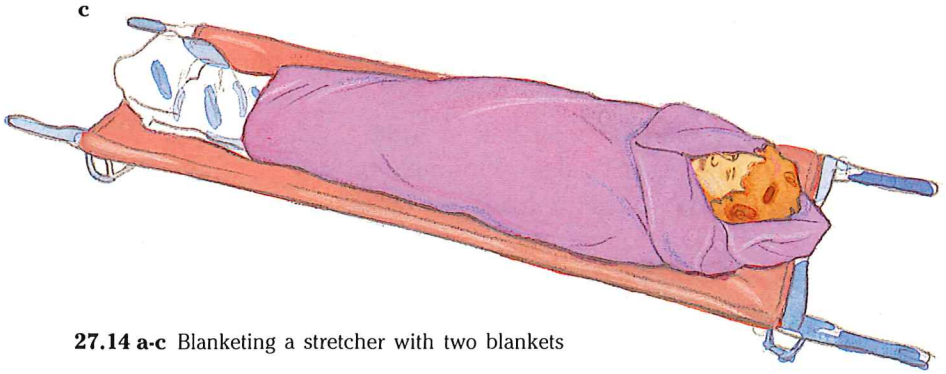
27.13 a-b Blanketing a stretcher with one blanket

a



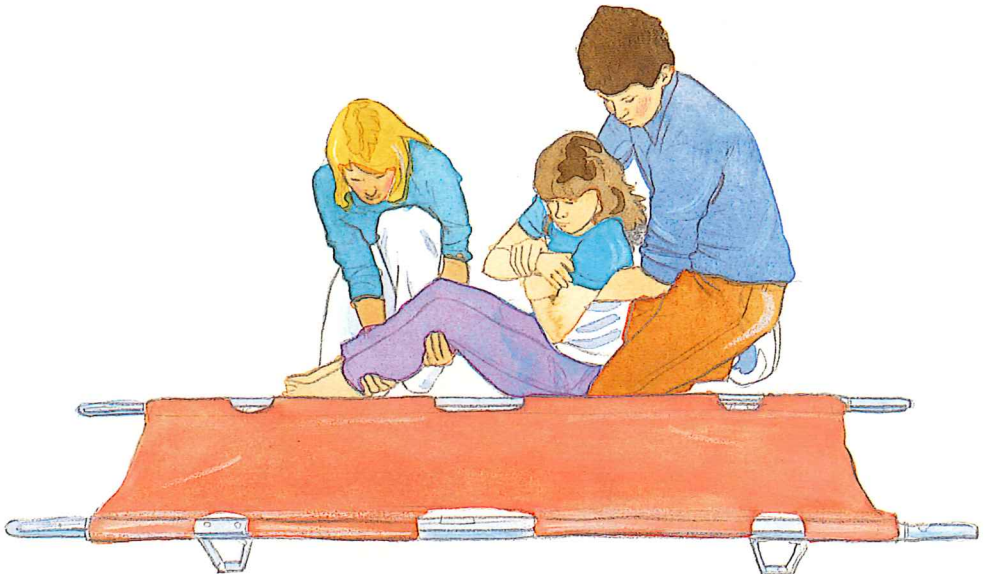
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27.14 a-c Blanketing a stretcher with two blankets

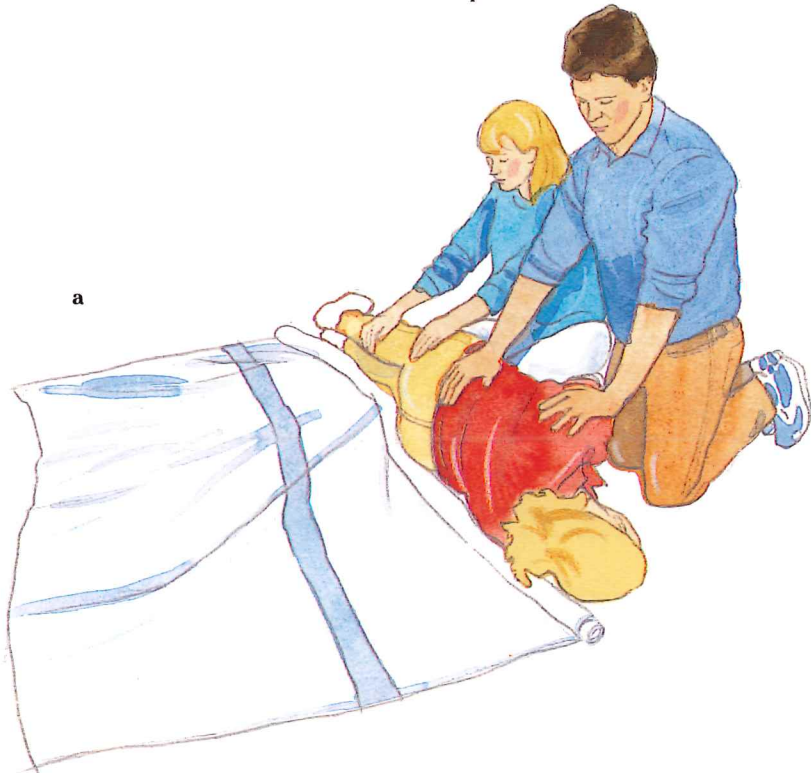
Loading a stretcher without using blankets

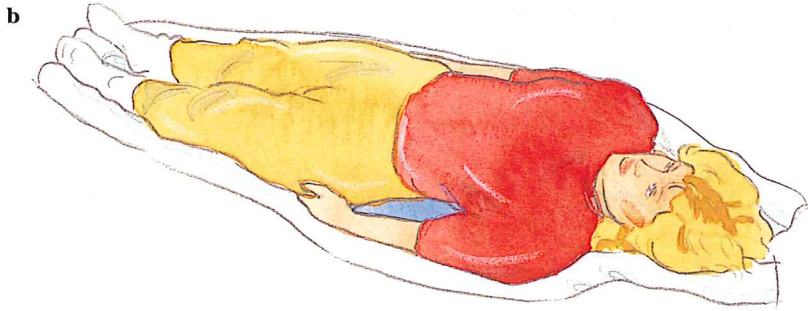


27.15 Loading a stretcher without using blankets

The blanket lift

- place the blanket on the ground in line with and against the casualty
- roll it lengthwise for half its width
- roll the casualty onto the uninjured side
- place the rolled portion of the blanket close to the casualty's back
- roll the casualty over the rolled edge onto the back
- unroll the blanket
- for lifting, roll up the edges of the blanket close to the casualty. Two first aiders should kneel on either side of the casualty and grasp the rolled edges, arms well apart, ensuring that the casualty's head is fully supported. While lifting the casualty, the first aiders should lean backward slightly and pull outward on the blanket to keep it firm.





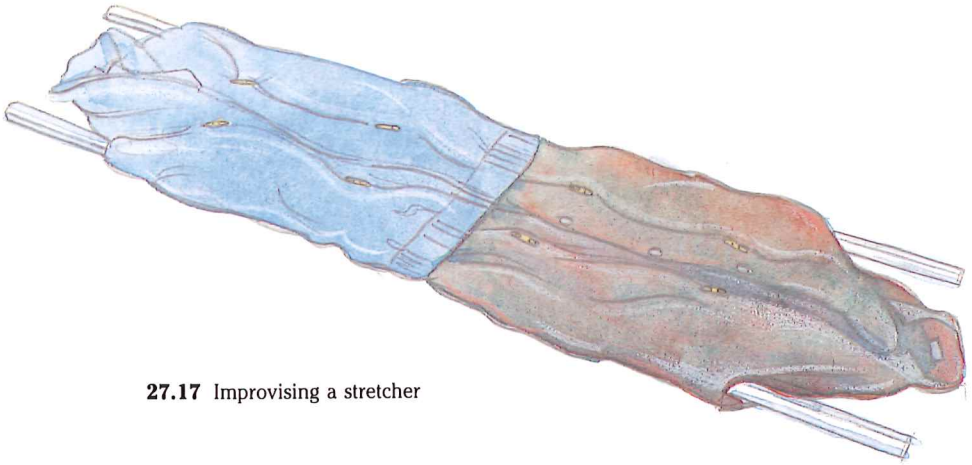
27.16 a-c The blanket lift

Improvised stretchers

A stretcher can be improvised using a:

- wire mattress
- ladder
- door
- table
- plank
- pole, with coats, sacks, blankets or bandages attached.

When using a coat, turn the sleeves inside out. Pass the poles through them and pin the coat ends around the poles. A cross piece, lashed to each pole at the head and foot, will make the stretcher more comfortable and effective. Blankets and pins can be used with poles in a similar way.



27.17 Improvising a stretcher

The Jordan frame

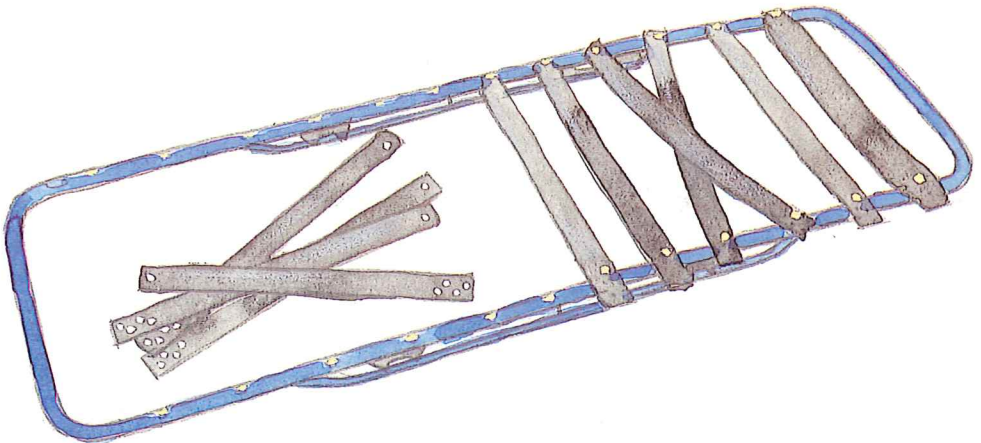
Use for casualties with suspected spinal or other major injury, if the casualty is accessible and the frame can be placed around him/her.

Advantages

- a rigid frame with plastic gliders, the Jordan frame can be used to lift an injured person with little or no disturbance to the injuries.

Method

- place the frame around the casualty and slide the plastic gliders underneath him/her
- fasten the gliders to the frame
- adjust the position and tension of each slat individually against the casualty's body
- the frame can be lifted and carried by two or more first aiders with minimum disturbance to the casualty.



27.18 The Jordan frame

The scoop stretcher

The scoop stretcher enables a casualty to be gently scooped onto the stretcher by a scissors leverage action. The casualty can be moved in the position found, so minimizing the possibility of

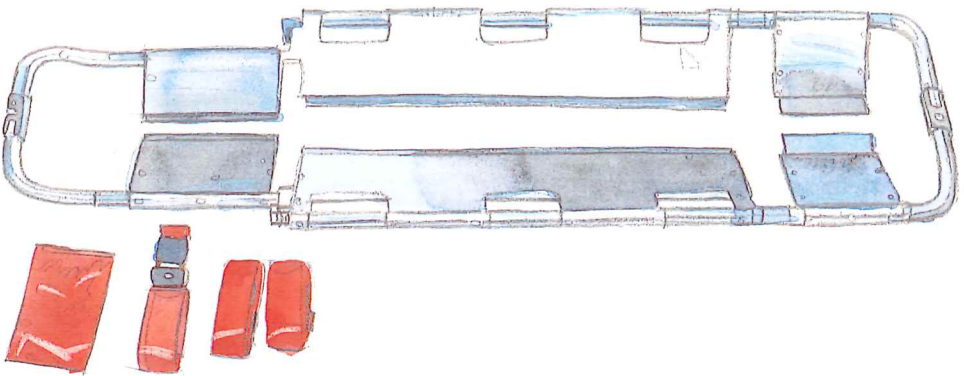
complicating injuries. The stretcher is adjustable to the casualty's physique.

It can be lifted and carried by two or more first aiders, and can be manoeuvred through a narrow passage way, door or staircase. In difficult manoeuvring situations, care should be taken to strap the casualty to the stretcher. A special velcro strap pillow should be used for immobilizing the head and neck.

Warning:

- avoid pressure on localized areas
- use padding
- remove coins, keys etc. from the casualty's pockets
- sandbags or similar padding may be used to maintain the head in a neutral position
- with the casualty on the back and the head supported by a pillow, monitor the airway closely
- if the casualty is heavy, lift the stretcher from the sides.

The stretcher is a lifting device which should be removed when the casualty is placed on a standard stretcher, trolley or bed.



27.19 The scoop stretcher

Transporting a casualty to medical aid

If a properly equipped ambulance is not available to transport a casualty to medical aid, the first aider may need to assist. The nature of the casualty's injuries will determine the appropriate alternative vehicle.

If you are driving with a casualty on board, do not exceed the speed limit. In many cases, you will need to travel more slowly so that the casualty's injuries are not worsened.

Casualties suffering from the following conditions must always be transported by stretcher:

- head injuries
- spinal injuries
- abdominal injuries
- lower limb injuries
- embedded foreign bodies or penetrating wounds to the eye.

Casualties with minor injuries and some upper limb injuries may be carried, preferably only for short distances, sitting in a standard car seat, provided that the injured parts are adequately supported.

28

The first aider at work

The first aider's role

First aid in the workplace

Hygiene

Documentation

Types of records

The first aider's role

- 1** The primary function of the first aider is to provide emergency first aid management of injuries and illness.
- 2** Legally, an injured person has a right to remain untouched by others. In an emergency, implied consent means that the casualty is unable to object to first aid and that the first aid given is reasonable.
- 3** The casualty is the responsibility of the first aider until relieved by medical aid. There is little possibility of prosecution if first aiders do all they can to keep the casualty alive by proper management and transportation to medical aid, using their training and experience.
- 4** Correct management and good records are the best protection against litigation.
- 5** Accurate recording and documentation of casualty information is the responsibility of the first aider.
- 6** A first aider cannot certify that a person is dead, even if the casualty has been decapitated or incinerated, or if the body is in a state of decomposition.
- 7** Employers are responsible for transportation of injured workers from the scene of an accident to the nearest medical aid.
- 8** The employer is required to maintain a written record of all injuries and illness.
- 9** It is the responsibility of the employer to maintain first aid equipment and services.
- 10** Where an employer fails to maintain first aid equipment and services, a safety inspector may order closure of part or all of the workplace.

First aid in the workplace

Legislation

The industrial workplace in Australia is governed by either state or federal legislation, which varies from state to state and industry to industry. Detailed requirements relating to first aid are often found in the Regulations to the Act. The law provides a set of minimum standards of protection for workers' health and safety. First aiders in the workplace should have a good working knowledge of the various Acts and Regulations relevant to their industries.

First aid rooms

Relevant state legislation sets down the minimum requirements for first aid rooms and kits. Guidelines laid down by the National Health and Medical Research Council in its document, Occupational First Aid, October 1980, state that first aid rooms:

- should have a minimum floor area of 15 square metres
- should be well illuminated and ventilated
- should have an access door at least 1.2 metres wide and easy access to toilets
- should have adequate space for rendering first aid.

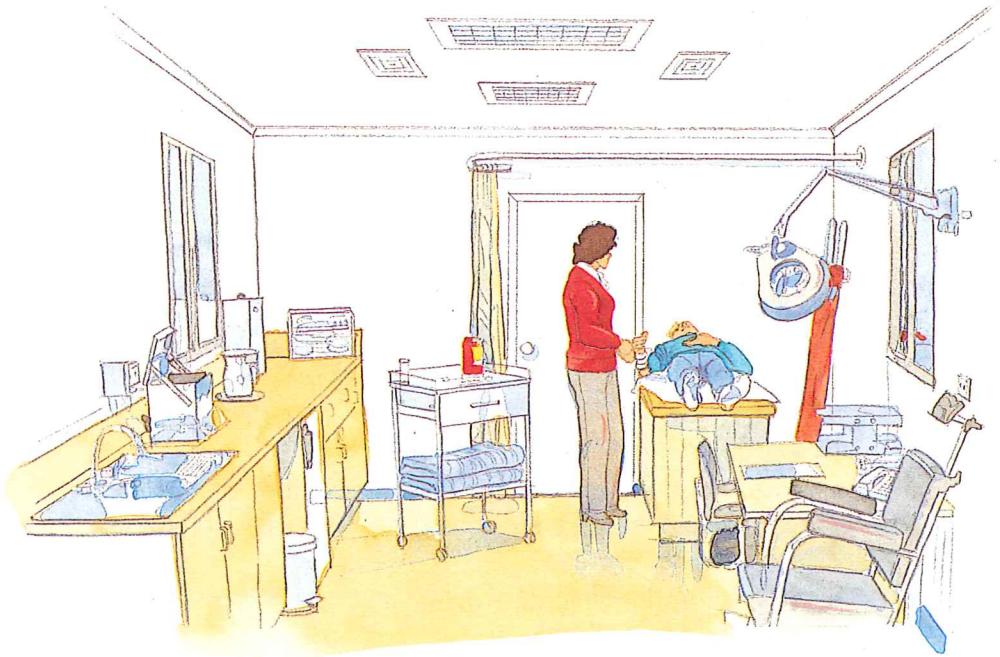
First aid kits

First aid kits should be located within 100 metres of any workplace. The location should be well illuminated and ventilated, with access to hot and cold running water, and with adequate space for providing first aid.

The first aider

Legislation may require that a person with a current first aid certificate be appointed to be responsible for the first aid kit/room when employees are at the workplace. A clearly marked up to date notice should be posted on the kit or outside the first aid room showing the name and work location of the person responsible.

The first aider responsible for the first aid room must ensure that general tidiness and cleanliness are maintained. All stock and equipment must be kept in dry, accessible storage areas which are free from clutter and dust. Stock must be regularly checked and replenished. Do not overstock as dressings and medications will deteriorate with time. All equipment should be



28.2 The first aid room

maintained in good working order. Medications should be clearly labelled and stored as directed. Expiry dates should be checked regularly.

Hygiene

As part of the routine at the beginning of the first aider's shift, all open surfaces in the first aid room should be washed with an appropriate disinfectant and dried thoroughly. Dust, dirt or liquid will breed microorganisms, thus increasing the risk of cross-infection.

Hand washing is very important to avoid spread of infection. Hands should be washed before and after management of a casualty.

More information on hygiene and sterilization is included in *Australian First Aid* chapter 19 — Communicable diseases and the first aider.

Documentation

The first aider should fully document all incidents where casualties seek advice or first aid.

This ensures:

- protection of the individual — progress of first aid management should be monitored and the facts surrounding an injury/illness recorded
- protection of the first aider, in the event of legal action
- protection of employers
- accurate data for the evaluation of illness/injury trends
- compliance with law. Some Acts require that work injuries are

recorded by the employer. In some cases, immediate notification of the accident must be given to the relevant government authority

- accurate information for workers' compensation.

All documentation must be accurate and legible:

- record the facts as stated by the casualty
- do not write down opinions or hearsay
- write in ink and do not erase errors. A line should be drawn through an error and 'wrong entry' noted
- the casualty should sign the entry.

All records must be kept confidential:

- only by written consent from the casualty can any records be disclosed other than to a medical practitioner
- medical records should be stored in a locked cupboard which is accessible only to the first aider
- records must be safely stored for 30 years, or in the case of the Operations Branch Casualty Report Forms, for 5 years.


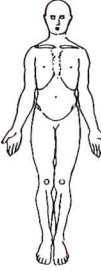

Types of records

Record formats vary depending on their use, industry, company or Operations Branch requirements.

Casualty Report Form

Members of the St John Ambulance Australia Operations Branch use the Casualty Report Form. This form is necessary for legal and insurance purposes.

One copy of the form should accompany the casualty to medical care. One copy is kept by the first aider and the remaining copy is for divisional files for reference and statistical purposes.

CASUALTY REPORT						
St. John Ambulance Australia						
LOCATION OF DUTY			TIME		DATE	
SURNAME OF CASUALTY		GIVEN NAMES		TITLE	D.O.B.	SEX
ADDRESS OF CASUALTY					POSTCODE	
FIRST AID ASSESSMENT AND OBSERVATIONS						
LEVEL OF CONSCIOUSNESS				<p style="text-align: center;">KEY TO CODING</p> <ul style="list-style-type: none"> A—ABRASION B—BURN C—CONTUSION D—DISCOLOURATION F—FRACTURE H—HAEMORRHAGE L—LACERATION P—PAIN R—RIGIDITY S—SWELLING T—TENDERNESS <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;">   </div>		
TIME	FULLY CONSCIOUS	CONFUSED DROWSY	UNCONSCIOUS			
TIME	PULSE	RESP	L PUPILS	R		
COMPLAINTS/SYMPTOMS/HISTORY						
GENERAL OBSERVATIONS						
FIRST AID MANAGEMENT						
REFERRAL FOR MEDICAL ADVICE						
HOSPITAL (BY AMBULANCE) <input type="checkbox"/>			HOSPITAL (BY CAR) <input type="checkbox"/>		OWN DOCTOR <input type="checkbox"/>	
SIGNATURE OF ST. JOHN MEMBER				DIVISION		DISTRICT

White: to CASUALTY for DOCTOR
Pink: to DIVISION
Blue: Retained by MEMBER

28.3 Casualty Report Form

Personal record/casualty history card

This record is strictly confidential and contains full details of all attendances to the first aid room. Personal details should be written on the top of the card. These should include:

- name
- date of birth
- address
- job
- allergies
- previous medical history.

Some companies have the workers' pre-employment medical and audiometry records attached to the history card.

Other information included is:

- history — what happened, where, casualty's complaint
- observation and vital signs
- first aider's assessment of the problem
- first aid management — wound dressings, medications, referral
- follow up — continuing management, recommendations.

Day book/daily attendance register

This book contains a summary of all casualties seen during a shift. Each entry should be signed by the first aider.

Injury report

The injury report is a full account of an accident as related by the casualty. A copy of this report should be given to the supervisor and safety officer.

Daily attendance register									
Date	Time	Name	D.O.B.	Type of injury/illness	Management	Work injury	Non-work injury	Referred to	Lost time

28.4 Sample daily attendance register

Injury statistics

These are a summary of injuries and illness occurring in a workplace at a given time. This data is useful in detecting trends. It can be used to prevent/reduce accidents and to evaluate safety procedures.

Injury statistics should show:

- number of work injuries
- number of work rechecks
- parts of body affected
- types of injury
- causes of injury
- total injuries
- total cost time.

Work injury report			
Date		Time	
Company			
Employee's name			
Address			
Date of birth		Occupation	
Supervisor's name		Department	
Witness			
Injury sustained			
Date		Time	
Exact location			
Cause (employee's full description)			
Nature of injury			
Type of personal safety protection used			
Type of personal safety protection provided			
Worn?	yes/no	adequate?	yes/no
	<input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> <input type="checkbox"/>
Action			
Management			
Casualty referred	yes/no	Place	
	<input type="checkbox"/> <input type="checkbox"/>		
Possibility of time lost	yes/no		
	<input type="checkbox"/> <input type="checkbox"/>		
Date			
Signed 1.		(Attendant)	
2.		(Employee)	

28.5 Sample injury report

a

MEDICAL IN CONFIDENCE	
Medical attendance: Trauma	
Medical Centre:	Week ending:
<hr/>	
Part of body injured	Weekly totals
Head	_____
Ears	_____
Eyes	_____
Neck	_____
Trunk	_____
Arm	_____
Multiple	_____
General	_____
<hr/>	
W.I. total new cases	_____
W.I. new cases referred to doctor	_____
Lost time — new cases	_____
<hr/>	
Nature of injury	
Fracture	_____
Dislocation	_____
Sprain	_____
Concussion	_____
Amputation	_____
Laceration	_____
Superficial	_____
Contusion	_____
Burns	_____
Infection	_____
Venomous bites, stings	_____
Multiple	_____
Barotrauma	_____
Decompression sickness	_____
Other	_____
<hr/>	
W.I. total rechecks	_____
W.I. rechecks referred to doctor	_____
Lost time — rechecks	_____
Total daily W.I. attendances	_____
Fatality	_____

b

MEDICAL IN CONFIDENCE	
Medical attendance: Illness	
Medical Centre:	Week ending:
	Weekly totals
Non-work injury	_____
Respiratory	_____
Ophthalmic	_____
Otological	_____
Cardio-vascular	_____
Gastro-intestinal	_____
Genito-urinary	_____
Musculo-skeletal	_____
Neuro-psychiatric	_____
Dermatological	_____
Infected lesion	_____
Infectious disease	_____
Infestation	_____
Venomous bites, stings	_____
Dental	_____
Barotrauma	_____
Decompression sickness	_____
Other	_____
<hr/>	
Total new cases	_____
New cases referred to doctor	_____
Lost time — rechecks	_____
<hr/>	
Total daily non-W.I. & illness attendances	_____
Total daily W.I. attendances	_____
Total daily attendances	_____
<hr/>	
Fatality	_____

28.6 a-b Sample injury statistics

Referral letter

When a casualty needs to be referred to medical aid, a referral letter should be prepared. It should include:

- personal details (brief)
- date
- history of injury or illness
- findings of examination
- first aid management
- first aider's signature.

If a chemical or toxic substance has been involved, all known data should accompany the casualty to medical aid.

MEDICAL REFERRAL PROFORMA	
From	location
To	location
Name of Employee	Date of birth
Employee's Company	Work injury yes/no <input type="checkbox"/> <input type="checkbox"/>
Nature of complaint or injury	
Management	
Industrial nurse/rig medic Occupational First Aider	Date

28.7 Sample referral letter

29

Casualty assessment

Primary assessment

Secondary assessment

History

Observations

The skin

Temperature

The pulse

Respiration

Conscious state

Recording observations

Primary assessment

A primary assessment of the casualty is performed to detect life-threatening problems which require immediate management. Use the DRABC Action Plan, followed by an overall search for obvious bleeding, which should be controlled immediately.



Secondary assessment

If the casualty does not have life-threatening problems, or if these problems are under control, a secondary assessment is carried out to assess other problems and the casualty is managed accordingly.

History

Identify the problem and then ask questions to gain more information about it:

- how did it occur?
- when did it occur?
- is the problem becoming worse or better?
- has the casualty experienced the problem before?
- is the casualty presently being treated for injury or illness?
- has medication been prescribed?
- does the casualty have any allergies?

Observations

The first aider should observe and record the casualty's vital signs and presentation, initially and if changes occur.

The skin

Skin colour can suggest a variety of medical conditions.

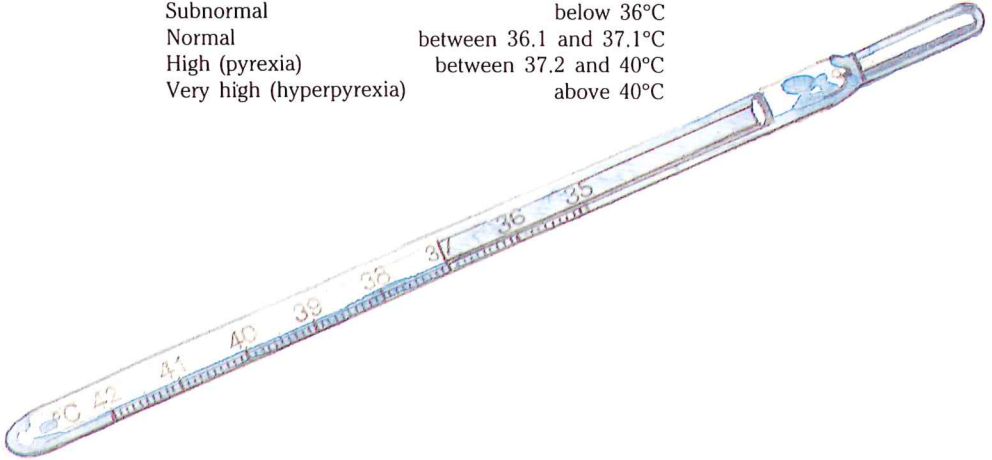
<i>Colour</i>	<i>Possible causes</i>
Red	High blood pressure, head injury, heat stroke or infection
White	Shock, hypothermia, emotional distress or heart attack
Blue	Asphyxia
Yellow	Liver disease

Temperature

Body temperature is the balance achieved between the heat produced in the body and the heat lost from the body. Heat is produced when muscles contract, and as a result of metabolic activity. It is lost through the skin by means of radiation, conduction and evaporation; and when urine is excreted from the kidneys, faeces by the bowel, and warm air by the lungs. Temperature is measured with a clinical thermometer and is expressed in degrees Celsius.

The temperature may be measured in the mouth, armpit, groin or rectum. It is not normal practice for first aiders to take

Subnormal	below 36°C
Normal	between 36.1 and 37.1°C
High (pyrexia)	between 37.2 and 40°C
Very high (hyperpyrexia)	above 40°C



29.1 Oral thermometer

the rectal temperature. The oral method is most commonly used. It should not be used in the following situations:

- when there is a danger that the casualty may bite, swallow or inhale the thermometer, e.g. a baby or young child, an irrational casualty, an unconscious casualty, a casualty who is subject to seizures
- when a casualty is unable to keep the mouth closed for the required time
- when a casualty is nauseous or has recently vomited
- when a casualty has a painful condition of the mouth
- when drinks or food have been taken within the last 10 minutes.

Measuring the casualty's temperature

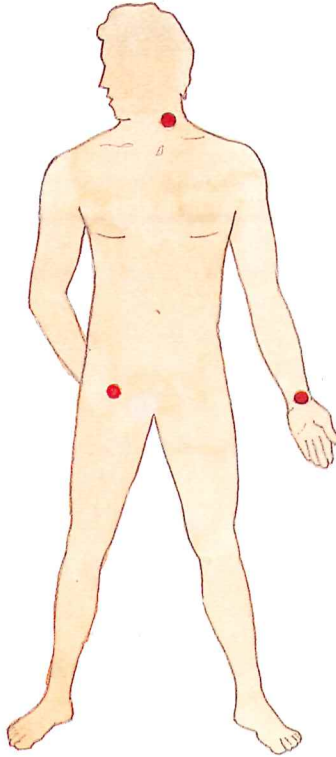
- 1** Wash your hands.
- 2** Tell the casualty what you are going to do. Check that he has not had food or drinks within the last 10 minutes.
- 3** Pick up the thermometer by the upper end.
- 4** Shake the thermometer until the mercury registers 35° Celsius or below.
- 5** Place the thermometer either:
 - under the tongue for at least 2 minutes, with the lips closed
 - under the armpit for at least 10 minutes.
- 6** Remain with the casualty while the thermometer is in position.
- 7** Read and record the temperature.
- 8** Wash the thermometer in cold water and place in antiseptic for storage.

The pulse

The pulse is the beat of the heart as felt through the distension of an artery wall, following each contraction of the left ventricle of the heart. It is felt where a superficial artery crosses a hard structure such as a bone, e.g.

- the radial artery on the thumb side of the wrist
- the carotid artery at the side of the neck
- the femoral artery in the groin.

Observations made about the pulse are its rate, rhythm and volume.



29.2 Pulse points

The *rate* is the number of beats each minute. The normal pulse rate varies with age, the average being:

- infancy: 70–120 beats per minute
- childhood: 70–110 beats per minute
- adulthood: 60–90 beats per minute
- old age: less than 60 beats per minute.

It may be increased by exercise, strong emotions and extremes of heat or cold, and may be decreased by rest, relaxation and fasting. Disease may cause an increased or decreased pulse rate.

The *rhythm* is the regularity of the beat. The normal pulse has a regular rhythm with evenly spaced beats. The pulse is described as irregular when the rhythm is disturbed and the beats do not occur at regular intervals. Some irregularities that may be noticed are:

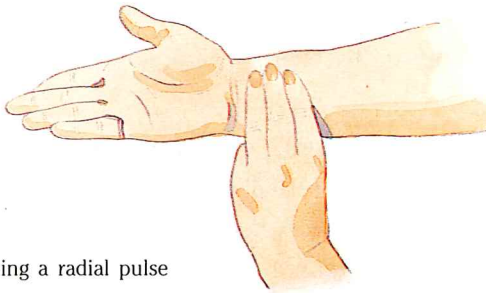
- missed beats
- double beats, sometimes followed by a long pause
- quivering pulse.

The *volume* is the strength of the heart beat. The normal pulse should be strong enough not to be compressed too easily. Abnormalities that may be noted are:

- a full bounding pulse
- a weak thready pulse.

Measuring the radial pulse

- 1** The casualty should have been at rest for at least 10 minutes, and not have had distressing or painful treatment.
- 2** Bring the casualty's arm across his/her chest and place three fingers over the wrist at the base of the thumb. Apply just enough pressure to enable the pulse to be felt easily.



29.3 Taking a radial pulse

- 3** Count the pulse for 1 minute, and at the same time, observe the rhythm and volume. Record on the casualty's chart.

Respiration

Respiration is the process that enables the body to obtain oxygen and remove carbon dioxide.

It consists of inspiration and expiration, brought about by the action of the diaphragm and the intercostal muscles. Although these are voluntary muscles, respiration is normally an automatic process which does not require a conscious effort to be made. Voluntary control can be exerted, and this tends to happen when a person is aware that the respirations are being observed. As a result, the rate, depth or rhythm may be altered.

By placing the casualty's arm across the chest when taking the pulse, the first aider can count the rise or fall of the casualty's chest, while giving the impression that the pulse is being observed.

The observations made about respiration are rate, rhythm and character.

The *rate* is the number of inspirations and expirations in 1 minute. The normal rate varies with age, the average being:

- infancy: 28–40 respirations per minute
- childhood: 20–28 respirations per minute
- adulthood: 16–20 respirations per minute.

It may be influenced by exertion, emotion, rest, sleep, fatigue and disease.

The *rhythm* is the regularity of respiration. Inspirations and expirations should occur at regular intervals.

The *character* of respiration is the way in which a person breathes. Normal respiration is quiet, even and effortless. Abnormalities include:

- slow respiration which may be associated with cerebral conditions or drug overdose
- rapid respiration due to respiratory tract diseases, diabetic

coma. Respiration may be shallow if deep breathing causes pain, e.g. in pleurisy

- laboured, snoring type (stertorous) usually due to obstruction of the airway
- a shrill harsh sound (stridor) caused by laryngeal spasm, e.g. in croup
- wheezing, noisy breathing, e.g. in bronchitis
- difficult breathing (dyspnoea) — muscles in the neck or abdomen may be brought into use
- ability to breathe only when upright (orthopnoea)
- cessation of breathing (apnoea)
- sighing respiration, characterized by long slow inspiration and quick expiration. This may indicate shock or an emotional disorder.

Observing respirations

- 1 Continue as if counting the pulse.
- 2 Count the rise and fall of the chest as 1 cycle.
- 3 Count the number of cycles for 1 minute.
- 4 Record rhythm and character.

Conscious state

Initial observations about the casualty's conscious state provide a basis for monitoring changes in condition. It is important to establish whether the casualty is conscious, partly rousable or unconscious.

Pupil reaction to light and pupil size are a source of information on the casualty's condition. Abnormal pupil reaction is usually a sign of a nervous system disorder. Beware of false indications, e.g. contact lenses and eye prosthesis (glass eye).

When assessing a conscious casualty, record:

- movement in all limbs
- strength in both handgrips.

Recording observations

When the temperature, pulse or respiration are to be recorded frequently, e.g. hourly, half hourly or quarter hourly, a special observation chart is usually used. All charts used to record vital signs are important documents and should be legibly presented.

When making entries:

- record all information immediately it has been obtained and do not trust to memory
- use only the official book or chart, and avoid writing on scraps of paper that could be lost or confused with other papers
- fill in all the information required clearly and neatly.

30

Advanced resuscitation

Equipment

Use of oxygen

Mechanical resuscitators

Portable resuscitators

**Manually triggered valve-mask
resuscitators**

Demand valve resuscitators

Soft bag-valve-mask resuscitators

**Self-inflating bag-valve-mask
resuscitators**

Oropharyngeal aspiration

Oropharyngeal airway

The air we breathe contains 21% oxygen. Any condition interfering with the normal transfer of oxygen into the blood, or with the circulation of blood to the tissues, will cause an oxygen deficiency in the body cells. This in turn causes cells to function ineffectively and allows accumulation of poisonous waste products.

Extra oxygen is a drug and a valuable aid in managing sick or injured casualties. It may be administered only when the first aider is thoroughly familiar with the rules and regulations for its storage and is competent in the safe use of equipment for administration of oxygen to a casualty.

Equipment

Oxygen may be administered to a breathing casualty by:

- face mask
- nasal prongs or specula.

It may be administered to a non-breathing casualty by:

- mouth to mask with added oxygen
- oxygen powered resuscitation
- bag-valve-mask system, soft bag
- bag-valve-mask system, self-inflating bag with added oxygen.

Oxygen cylinders

In Australia, medical oxygen in a gaseous form is supplied in black metal cylinders with a white collar. Because oxygen cylinders are filled and stored under high pressure (approximately 13 400 kPa or 2000 psi — 132 atmospheres) and because oxygen aids combustion, it is important to adhere to safety precautions. Government and insurance regulations concerning the storage of oxygen must also be observed.

<i>Size code</i>	<i>Approx. contents when full</i>
C	440 litres
D	1640 litres
E	3800 litres
G	7600 litres

Safety precautions

- 1** When a cylinder is almost empty, the valve should be closed, leaving some positive pressure in the cylinder. Mark the cylinder as empty. Do not store full and empty cylinders together.
- 2** Do not use a cylinder without a proper regulating device.
- 3** Always use correct pressure gauges with oxygen.
- 4** Always ensure that the 'O' ring and valve seat inserts are clean, dry and in good condition.
- 5** Do not drop, drag, roll or slide cylinders. If a cylinder is fractured, the pressure released will convert the cylinder to a high powered missile.
- 6** Do not use oxygen around an open flame as it will explode. Smoking should not be allowed near oxygen equipment.
- 7** Store oxygen cylinders upright in a cool, ventilated room which is fire-resistant. If stored in the open, cylinders should be protected from weather extremes and ground dampness.
- 8** Do not allow petroleum-based grease or oil to come in contact with supply devices on the stem of the cylinder.
- 9** Use only medical oxygen for administration to a casualty. Industrial oxygen contains impurities.

Delivery system

Oxygen is delivered from the cylinder by a regulator which reduces the high cylinder pressure to a safe working pressure of approximately 400 kPa or 60 psi (4 atmospheres).

Oxygen delivery apparatus has a bronze cylinder (yoke type) and usually has pin fittings which match holes or the valve stem of the cylinder.

This 'Pin Index' safety system prevents application of an incorrect regulator to the oxygen cylinder, or a cylinder containing other than oxygen to the regulator.

Flow rates for medical oxygen

The oxygen flow must be capable of being controlled and measured. This may be by:

- a fixed flow self-sealing outlet at 3, 5 or 8 lpm
- an adjustable flow meter which allows from 1 to 14 lpm to be delivered. Flow is indicated either by a floating device in a clean tube, or on a dial. This is the preferred method.

A full C size cylinder containing 400 litres will empty in 40 minutes if a flow rate of 10 lpm is used.

Other equipment

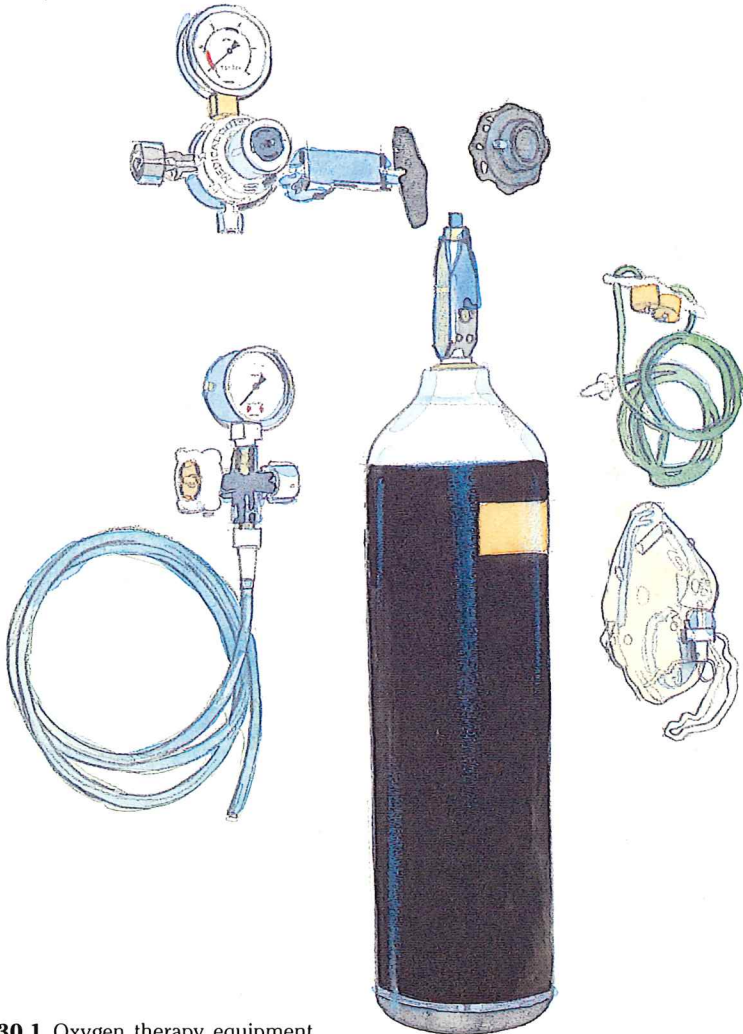
Translucent PVC *oxygen tubing* with an internal diameter of 4.8 mm is used for carrying oxygen via flow meters to a mask or cannula.

The *Linket tubing connector*, a universal, transparent, nylon connector, is available for connecting a nasal cannula to oxygen tubing, or for adding additional lengths of tubing when required.

Universal face masks, which are made of semi-soft transparent plastic, are capable of delivering oxygen concentrations ranging from 25% at 1 lpm up to 60% at 14 lpm.

The *intra-nasal cannula* has two prongs which fit into the nostrils and provide oxygen to a casualty.

A *humidifier* is a water bottle through which oxygen is bubbled to add some moisture to the dry oxygen. Humidifiers are not very efficient and become contaminated if not cleaned daily.



30.1 Oxygen therapy equipment

Selecting and preparing an oxygen cylinder

Select a cylinder of appropriate size. Check that the label states 'oxygen' and that the cylinder is black with white shoulders. Check the valve stem to ensure no obvious damage. If necessary wipe the valve stem clean before removing the plastic protective seal. Remove the plastic seal from the cylinder outlet. With the valve outlet pointed away from you, slowly open the valve for one second, then close it. This is called 'cracking' the valve and checks that the cylinder contains oxygen and that any dust that may be in the outlet is removed.

Connecting oxygen equipment

After 'cracking' the cylinder valve, attach the contents gauge to the cylinder and tighten gently with an oxygen spanner. Attach the flow meter to the contents gauge and tighten to firm finger pressure. Attach the oxygen delivery tube to the oxygen outlet of the flow meter. Use finger pressure only to tighten. Do not use a spanner.

Checking for leaks

To check for leaks:

- turn all oxygen outlets 'OFF'
- turn oxygen cylinder valve 'ON'
- turn oxygen cylinder valve 'OFF'
- if contents gauge indication moves back towards 'EMPTY' check all connections as there is a leak
- to isolate the leak, sparingly brush mixture of water and detergent over each connection, and observe from which connection bubbles appear
- rectify by undoing the connection and re-assemble
- if it still leaks, have it checked by a technician.

Maintaining equipment

Equipment which is stored in readiness must be checked regularly and the cylinder turned on and off again to check the cylinder contents.

After use, wipe the regulator carefully with a damp cloth and antiseptic soap. Take care that no soap or water enters the unit. Check that the 'O' ring in the handwheel connection is always correctly positioned and in good condition.

Although it is not usually necessary, the whole unit may be autoclaved.

Use of oxygen

Indications for oxygen therapy include:

- unconsciousness
- shock
- heart attack
- heat stroke
- severe injury of any type
- respiratory distress
- poisoning
- gas or smoke inhalation.

Therapeutic oxygen can be administered by means of a face mask or intra-nasal cannula. This will increase the oxygen concentration in casualties who are breathing.

- face mask adult — up to 10 lpm
- nasal cannula adult — up to 3 lpm.
Chronic obstructive airway disease —
1–3 lpm as indicated
- demand valve high flow
- closed circuit adult — 0.5–10 lpm.

Administering oxygen by face mask

The most commonly used disposable face mask for giving therapeutic oxygen to a breathing casualty is known as the universal face mask. It is available in adult and child sizes. This mask is also referred to as a soft mask or Hudson's mask. Oxygen delivered to the mask is mixed with air drawn in through side holes. Exhaled air is vented through side holes. The percentage of oxygen inhaled depends on the rate and depth of respiration and the oxygen flow rate.

Face masks should be of clear plastic, disposable and should fit the face firmly. It is advisable to use a new disposable mask at each separate application. Some casualties have fear of a mask being placed over the face and need careful reassurance of the benefits of oxygen.

Warning: disconnection of the oxygen supply may result in the casualty rebreathing his exhaled air.

To administer oxygen by face mask

- 1 Reassure the casualty. Explain the need for oxygen therapy.
- 2 Turn oxygen source on.
- 3 Ensure oxygen tubing fitted securely to outlet nipple on flow meter.
- 4 Fit appropriate size mask.
- 5 Adjust flow rate to appropriate rate.
- 6 Position face mask comfortably on casualty.
- 7 To prevent oxygen from blowing directly into the casualty's eyes, ensure that the face mask fits snugly, by squeezing the soft metal strip on mask over the nose to form a seal.
- 8 On completion of therapy, remove mask and close flowmeter valve.
- 9 Ensure oxygen is turned off.

Administering oxygen by intra-nasal cannula

Oxygen is delivered into a casualty's nostrils through two plastic prongs. Effectiveness is reduced if the casualty has any sort of nasal obstruction, e.g. cold, injury.

The nasal cannula is the simplest, most comfortable means of delivery. The casualty can talk, drink, cough and have airway care without interrupting oxygen administration.

To administer oxygen by intra-nasal cannula

- 1** Reassure the casualty and explain the need for oxygen therapy.
- 2** Place casualty in sitting position if appropriate for the condition.
- 3** Select an appropriate size cannula.
- 4** Remove cannula from its package and extend the elastic strap.
- 5** Connect the oxygen tubing to the flowmeter outlet nipple and turn oxygen supply on.
- 6** Adjust flowmeter control to required rate.
- 7** Insert tip of cannula into casualty's nostrils. Place the elastic strap under the casualty's ears and secure by tightening it.
- 8** Secure tubing to casualty's clothing.
- 9** Check flow rate and comfort of casualty.

Mechanical resuscitators

There are three types of mechanical resuscitators:

- oxygen powered valve-mask (manually triggered or demand)
- soft bag-valve-mask
- self-inflating bag-valve-mask.

The hazards associated with mechanical resuscitators include:

- possible difficulty in maintaining a seal with mask as well as maintaining an airway
- the stomach is easily distended with oxygen if the airway is not totally open, due to high flow rate.

Portable resuscitators

Portable resuscitators are an advantage in the workplace because:

- the casualty can be given a high concentration of oxygen
- some portable resuscitators include a number of pieces of emergency apparatus in a compact box, e.g. suction, demand valve and therapeutic oxygen mask.

The first aider must check the emergency equipment daily for:

- mechanical soundness
- oxygen content.

Advantages and disadvantages of various resuscitators

<i>Resuscitators</i>	<i>Advantages</i>	<i>Disadvantages</i>
Air-viva Laerdal Ambu (and others)	<ul style="list-style-type: none"> •simple •self-filling bag •oxygen supply not essential (can be added as a supplement) •light, portable, compact, easy to store, cheap •can be used without oxygen in hazardous environments 	<ul style="list-style-type: none"> •one hand only for mask •no diagnosis of breathing patterns
Oxy-viva R-M Head	<ul style="list-style-type: none"> •ventilates casualty with 100% oxygen •both hands free to hold mask •suction available 	<ul style="list-style-type: none"> •pressure may distend the stomach •rapid inflation rate •can't be used for spontaneously breathing casualty •no diagnosis of breathing patterns •oxygen supply essential •high oxygen consumption
Oxy-viva demand head	<ul style="list-style-type: none"> •ventilates casualty with 100% oxygen •both hands free to hold mask •100% oxygen for spontaneously breathing casualty •suction available 	<ul style="list-style-type: none"> •pressure may distend stomach •rapid inflation rate •no diagnosis of breathing pattern •good face seal essential to obtain 100% oxygen from demand valve •oxygen supply essential •high oxygen consumption

continued

continued

<i>Resuscitators</i>	<i>Advantages</i>	<i>Disadvantages</i>
Oxy-Resuscitator (Komesaroff)	<ul style="list-style-type: none"> •ventilates casualty with 100% oxygen •100% oxygen for spontaneously breathing casualty •diagnosis of breathing patterns •very low oxygen consumption — long duration •suction available 	<ul style="list-style-type: none"> •mask held with one hand while other squeezes bag •good mask seal essential for effective resuscitation •awkward to carry •needs more training to use well

Manually triggered valve-mask resuscitators

These consist of an oxygen supply connected to a valve which fits directly on top of the mask. The valve is provided with a button, which, when depressed, delivers 100% oxygen under pressure to the lungs. When the button is released, expired air passes out through a valve into surrounding air.

Demand valve resuscitators

These are modified manually triggered valve-mask resuscitators. They only work if the face mask has an airtight fit and the casualty is breathing. They allow the casualty to take in 100% oxygen. On inspiration, the demand valve automatically starts the flow of oxygen. On expiration, oxygen is shut off and expired

air is released through a valve. The demand valve has a manual override which enables the resuscitator to be used to inflate the lungs of a casualty who is not breathing.

The Oxy-viva with demand valve offers 100% oxygen to a breathing casualty. Oxygen is delivered on demand, through a resuscitation mask, with the flow control set on maximum. Even a very slight inhalation effort will trigger an oxygen flow which is proportional to the casualty's inhalation effort. The oxygen flow will stop during exhalation. The casualty's breathing pattern can be monitored easily by the audible sound of the oxygen flow each time he inhales.

The casualty may require a lot of reassurance prior to accepting the solid resuscitation mask being placed over the face. He will need to be instructed to breathe normally as there is a natural tendency to overbreathe once the mask is applied. It is preferable for the casualty to hold the mask in place.

Checking an Oxy-viva Mark 3

- 1 Check contents:
 - 1 oxygen cylinder — contents not less than half full
 - 1 resuscitation mask — adult
 - 1 resuscitation mask — child
 - 1 oxygen therapy face mask — adult
 - 1 oxygen therapy face mask — child
 - 3 Guedel airways — standard sizes
 - 1 oxygen nasal catheter
 - 4 Y suction catheters FG 6, 10, 12 and 14
 - 1 yoke plug
 - 1 container of yoke washers
 - 1 oxygen cylinder keywheel
 - 1 suction tubing
 - 1 suction jar with head
 - 1 resuscitation hose
 - 1 resuscitation head.

CONTINUED

*CONTINUED**Checking an Oxy-viva Mark 3*

- 2** Turn oxygen cylinder on and note contents.
- 3** Ensure that the suction unit is operating by holding the end of the suction tubing against a finger and turning the suction lever on. Once checked, turn suction control off.
- 4** Ensure that the resuscitation head functions when the oxygen is turned on and the plunger is pressed. When released, the plunger must return fully to the off position and completely shut off the oxygen flow.
- 5** Check that the face mask (adult) is connected to the oxygen therapy outlet via the oxygen therapy tubing and that oxygen flows into the mask when the therapy lever is moved to the on position. Once checked, turn therapy lever to the off position.
- 6** Turn oxygen cylinder off.
- 7** Depressurize system by turning the suction control lever to the on position. When oxygen cylinder contents gauge indicates empty, turn suction control lever to the off position.
- 8** Ensure that the resuscitator head is set on adult and that the adult resuscitation mask is attached.
- 9** Ensure that all suction components are clean and dry.
- 10** Ensure rubber face pieces on resuscitation masks are not perished and are inflated.
- 11** Ensure all component parts and contents are clean and operational. All non-disposable component parts may be cleaned with methylated spirits or an approved antiseptic solution.
- 12** Ensure that oxygen cylinder is turned off when not in use.

Changing an oxygen cylinder and operating an Oxy-viva Mark 3

A Changing an oxygen cylinder

- 1** Remove plastic seal from neck of oxygen cylinder.
- 2** 'Crack' cylinder valve by opening slowly and closing cylinder valve quickly to blow out any dust and to ensure that the cylinder is not empty.
- 3** Close cylinder valve on oxygen still in place on unit.
- 4** Rotate the cylinder yoke key in an anticlockwise direction until the shaft of cylinder yoke key is clear of the cylinder neck by approximately 1.5 cm.
- 5** Pull neck of cylinder towards the shaft of the cylinder yoke key to free the oxygen cylinder from the location pins of the cylinder yoke.
- 6** Slide empty oxygen cylinder clear of the cylinder yoke.
- 7** Ensure that a sound yoke washer is in place around the oxygen aperture. Replace if necessary.
- 8** Locate full oxygen cylinder into unit by pushing neck of cylinder through the yoke and lining up to the two location holes in the neck of the cylinder with the two locating pins on the cylinder yoke.
- 9** Secure in position by rotating the cylinder yoke key in a clockwise direction until tight.
- 10** Turn oxygen cylinder on. Check contents gauge and ensure that the cylinder yoke connection is not leaking.

B Oxygen therapy

- 1** Ensure oxygen cylinder is turned on.
- 2** Connect an end of the oxygen therapy tubing to the outlet nipple marked therapy.

CONTINUED

*CONTINUED**Changing an oxygen cylinder and operating an Oxy-viva Mark 3*

- 3** Connect a face mask to the other end of the oxygen therapy tubing.
- 4** Turn oxygen therapy control on. This delivers a fixed flow of oxygen.
- 5** Carry out oxygen therapy by face mask technique.
- 6** Alternatively if variable flow rate is essential, attach a flowmeter to the oxygen inlet/outlet connection on side of carry case. Connect oxygen therapy tubing to flowmeter and carry out oxygen therapy.

C Aspiration

- 1** Ensure oxygen cylinder is turned on.
- 2** Connect one end of suction tubing to the straight nipple of the suction jar head.
- 3** Connect the appropriate size Y suction catheter to other end of suction tubing.
- 4** Turn suction control on.
- 5** Carry out aspiration as detailed below in section on oropharyngeal aspiration.
- 6** On completion, clean suction components:
 - unscrew jar, empty and clean
 - disconnect suction tubing from angled nipple of suction jar head
 - dispose of Y suction catheter
 - clean and dry all suction components and reassemble unit.

Note: Do not tip suction jar over if containing secretions, blood etc., as these may flow into the suction control.

D Resuscitation

- 1** Ensure that the oxygen cylinder is turned on.
- 2** Operate resuscitation head.

Operating oxygen demand valve for a breathing casualty

- 1** Ensure that the oxygen source is turned on.
- 2** Turn flow control to adult in all cases of oxygen therapy
- 3** Select the appropriate size resuscitation mask.
- 4** Attach the selected resuscitation mask to the demand valve head by:
 - pushing the round opening of mask onto the non-rebreathing valve
 - rotate the mask in a clockwise direction to ensure that the black plastic demand valve head adaptor is screwed firmly to the demand valve metal body. Failure to do this may result in malfunction of the demand valve unit.
- 5** Reassure the casualty as to the need for oxygen therapy.
- 6** Tell the casualty to breathe normally once the mask is applied to the face and not to squeeze or press the lever on the demand valve head.
- 7** Position resuscitation mask comfortably on the casualty's face covering nose, then mouth. Ensure a seal over the nose and mouth by either of the following methods:
 - instructing the casualty on how to hold the mask to ensure the seal over the nose and mouth
 - holding the resuscitation mask in place if the casualty is unable to do so.
- 8** Monitor casualty's pattern of respirations by listening for the audible sound of the oxygen flow during casualty's inhalation. If casualty is unconscious, the pattern of respirations may be monitored by following the above procedure, steps 1 to 4.

Operating oxygen demand valve for a non-breathing casualty

- 1** It is desirable to insert an oropharyngeal airway before a demand valve mask unit is used. See section on oropharyngeal airways on pages 144–147.
- 2** Ensure oxygen source is turned on.
- 3** Turn flow control to appropriate setting (adult or child).
- 4** Select the appropriate size resuscitation mask. Attach it to the demand valve head by:
 - pushing the round opening of mask onto the 22 mm opening of the demand valve head adaptor
 - rotating the mask in a clockwise direction to ensure that the black plastic demand valve head adaptor is screwed firmly to the demand valve metal body. Failure to carry out this step may result in malfunction of the demand valve unit.
- 5** Align the nose portion of the resuscitation face mask with the control lever on the demand valve body.
- 6** Place the resuscitation face mask on casualty's face covering nose, then mouth.
- 7** Maintain casualty head tilt by pulling the chin upwards and backwards with the middle, ring and little fingers of both hands.
- 8** With the thumb and index finger of both hands, clasp the resuscitation face mask firmly to the casualty's face. Ensure a seal over the nose and mouth.
- 9** Lift one thumb from the mask and place on hook section of control lever. If one hand only is used to hold mask, use other hand to operate lever.
- 10** Pull the control lever down towards the mask (not against the body of the demand valve), until the chest rises, then release.
- 11** The sequence of ventilations is as in EAR. If the chest rises too slowly, rotate the flow rate towards adult setting to increase it. If the chest rises too quickly, rotate the flow rate control towards child setting to decrease it.

Soft bag-valve-mask resuscitators

There are two types which depend on oxygen. The bag is made of soft rubber which remains collapsed until filled with oxygen.

In the soft bag and mask (semi-closed circuit), some expired air is re-breathed, but a high flow of oxygen prevents a build-up of carbon dioxide.

The soft bag and mask (closed circuit) has a breathing system incorporating a carbon dioxide absorber which contains soda lime granules that remove carbon dioxide chemically. Only a small flow of oxygen is required. Concentrations ranging up to 100% can be achieved with rates as low as 0.5 lpm. Alternatively, a cannula or face mask can be connected either to the fixed 3 lpm flow outlet, or using the 'Tassie' connection to a flow adjustable from 0.5 lpm to 8.1 lpm.

Self-inflating bag-valve-mask resuscitators (e.g. Air-viva)

These resuscitators can be used with or without oxygen on a casualty who is not breathing.

Without oxygen, 21% oxygen is provided instead of 16% using EAR. Training and practice in their use is important for these resuscitators to be effective.

Oxygen may be added via an inlet into the bag. This gives a greater oxygen percentage to the casualty. Between 30% and 100% oxygen may be provided depending on flow rate and attachments.

Checking and operating an Air-viva Mk 1

Check:

- Air-viva case
- ventilation bag
- casualty valve
- adult resuscitation face mask
- child resuscitation face mask
- 3 Guedel airways — standard sizes
- that the rubber face pieces are not perished and are inflated
- that all component parts are clean and fully operational.

- 1** In non-breathing casualties, it is preferable to insert an oropharyngeal airway before a bag valve mask unit is used since the one-hand grip for holding the mask tends to close the casualty's mouth.
- 2** Select appropriate size resuscitation mask.
- 3** Attach resuscitation mask to casualty valve by pushing the round opening of the mask onto the valve.
- 4** Place resuscitation mask on casualty's face covering the nose, then the mouth.
- 5** Maintain casualty head tilt by pulling the chin upwards and backwards with the middle, ring and little fingers of the left hand.
- 6** With the thumb and index finger of the left hand, clamp the mask firmly to the casualty's face. Ensure a seal over the nose and mouth.

- 7** With the right hand, ventilate the casualty by squeezing the ventilation bag smartly until the casualty's chest rises.
- 8** Release the ventilation bag promptly and completely allowing the casualty to exhale through the mask and valve.
- 9** Check effectiveness of ventilation by:
 - observing that casualty's chest rises with each inflation
 - observing casualty's face and lip colour through mask
 - watch for secretions and stomach contents under the mask. If present, turn casualty on the side and clear airway.
 - sequence of ventilations is as for EAR.
- 10** If the ventilation bag will not compress, the airway is obstructed. Correct the obstruction.
- 11** This method will deliver atmospheric percentage of oxygen to the casualty. If a higher concentration of oxygen is required, the following method should be used:
 - connect the other end of the oxygen therapy tubing to a flowmeter
 - connect the other end of the oxygen therapy tubing to the oxygen nipple on the side of the casualty valve on the Air-viva
 - turn flowmeter on to appropriate rate per minute
 - operate as per preceding method.

Oropharyngeal aspiration

A sucker is used to aspirate fluid, e.g. mucus, saliva, vomit, from the mouth and nose to prevent inhalation of the fluid and to obtain and maintain an unobstructed airway.

Oropharyngeal aspiration — Yankauer suction tube

- 1** Connect Yankauer suction head to suction tubing.
- 2** Turn suction source on.
- 3** Open the casualty's mouth with the crossed finger technique.
- 4** Hold the suction head handle by cradling it in the curled fingers of one hand leaving the thumb free.
- 5** Insert the suction tube tip into the direct view area of the pharynx without the hole in the head being blocked. The curve matches mouth and pharynx.
- 6** Aspirate the casualty by blocking the hole in the tube adjacent to the suction handle with thumb holding the suction head handle.
- 7** Withdraw the suction head slowly.
- 8** Aspirate for a maximum of 5 seconds and then ventilate the casualty prior to repeating the procedure.
- 9** Insert the suction head into a bowl of water aspirating the water to clear the suction head and tubing.
- 10** Ensure that the aspiration bowl does not fill beyond two-thirds full.

Oropharyngeal aspiration using a 'Y' suction tube (flexible catheter)

- 1** Connect the appropriate size Y suction catheter to end of suction tubing.
 - 2** Turn suction source on.
 - 3** Determine the maximum length of catheter by measuring the distance (with the catheter) from the corner of the casualty's nose against the face to the earlobe.
 - 4** Open the casualty's mouth with the crossed finger technique.
 - 5** Insert catheter to the appropriate depth with the Y piece open.
 - 6** Aspirate by blocking Y piece on catheter with a finger and rotating catheter continuously during removal.
 - 7** Aspirate for a maximum of 5 seconds at any one time. Allow the casualty to breathe oxygen, or ventilate the casualty before repeating procedure.
 - 8** Insert catheter into a bowl of water, aspirating the water to clear catheter and tubing.
 - 9** Ensure aspiration bowl does not fill beyond two-thirds full.
 - 10** If an oropharyngeal airway is in place, carry out the above procedure, aspirating either side of the oropharyngeal airway as well as the inside.
- Note:** Do not leave suction turned on unnecessarily as it wastes oxygen at approximately 20 lpm.

Oropharyngeal airway

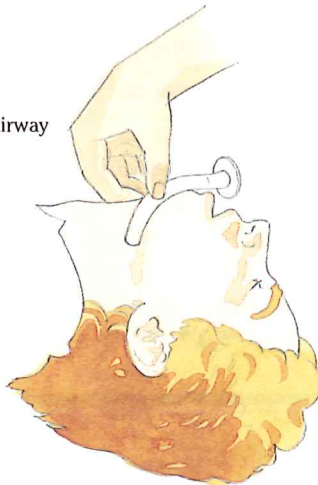
An oropharyngeal airway is a device used to assist in establishing and maintaining an adequate airway. It is used in association with a mechanical resuscitator on an unconscious, breathing casualty when difficulty is experienced in maintaining an open airway.

Inserting an oropharyngeal airway

- 1** Ensure that the casualty's airway is clear.
- 2** Obtain correct size oropharyngeal airway by placing it on the casualty's face so that it measures from the centre of the lips to the angle of the jaw.

30.2 a

Obtain correct size airway



- 3** Use one hand with the thumb and index finger crossed to pry the casualty's teeth apart and hold the mouth open.

Warning: be careful when inserting an oropharyngeal airway. Do not use on a semi-conscious casualty as it can irritate the back of the throat and cause vomiting, coughing or spasm of the larynx. If the casualty shows any signs of retching, remove the airway at once.

- 4 With the tip pointing towards the roof of the casualty's mouth, insert the airway approximately one-third of its length into the casualty's mouth.

b
Insert airway



- 5 Rotate the airway over the tongue so that it now points towards the side of the casualty's mouth.
- 6 Gently push the airway approximately two-thirds of its length into the casualty's mouth whilst rotating it so that the tip is pointing down the pharynx.

CONTINUED

CONTINUED

Inserting an oropharyngeal airway

- 7** Gently push airway further into the casualty's mouth until its flange is pressing on the lips.

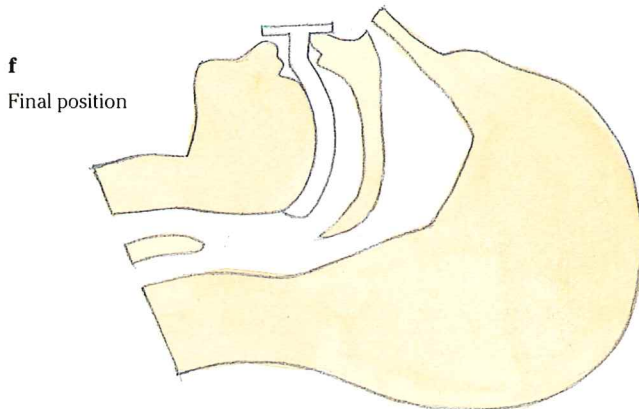
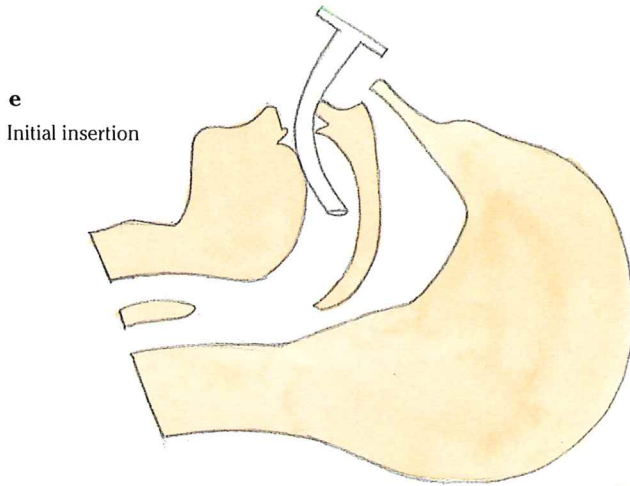
c
Rotate airway



- 8** Hyperextend the casualty's head and, if necessary, apply jaw thrust to assist in settling the oropharyngeal airway into correct position and maintaining an airway. If casualty shows any signs of rejecting the oropharyngeal airway, remove it immediately.

d
Settle airway into correct position





30.2 a-f Insertion of an oropharyngeal airway

31

Triage

The mass casualty situation

Negative (or reverse) triage

Triage is the classification and sorting of casualties for the purpose of management and evacuation, according to the degree of urgency. The aim is to ensure that the most good is done for the largest number of people. It only applies to a situation where there are a number of casualties to be sorted. It does not apply to a single casualty, although the principles involved can be used as a guide to determine the degree of urgency involved in the management of the casualty.

The mass casualty situation

Accidents can occur in industry resulting in a number of casualties, e.g. explosions, collapse of buildings or scaffolds. In such an incident, the first aider may have to take charge of a team effort to attend to all the casualties. In order to ensure that the most serious injuries are treated in their right order of priority, the first aider needs to assess the casualties' injuries according to a plan.

Clearing the accident site

In order to minimize congestion which interferes with rescue work, and because of the danger of further casualties from secondary explosion and building collapse, it is important to remove casualties from the accident site as soon as possible and to obtain appropriate treatment for those most seriously injured. Hence the need for a triage system.

The degree of urgency

All casualties feel that their case is more urgent than anyone else's. However, the first aider may have to decide from among several casualties who will be evacuated first and with what

degree of urgency. It is important to remember that a casualty is in a dynamic, not a static condition. It does not mean that because the casualty feels and looks good at the present time, he will be in the same condition in an hour or two. This is important in head and abdominal injuries, where a gradual deterioration in condition can occur.

An important principle to use, as a guide, is that the saving of life takes precedence over the saving of a limb. The management of absent breathing and circulation, and blood loss are of primary importance. The protection of the airway and the control of bleeding are the most vital things achievable by the first aider. They are conditions that are most readily managed by a surgical team in a hospital.

Another important principle is that function takes priority over appearance. A fractured limb may appear grossly deformed but there may be little damage to skin, blood vessels and nerves. On the other hand, an injured limb may show no external deformity but numbness, pallor of the extremity and absent pulses may indicate the need for urgent hospitalization.

Casualty groups

In a mass casualty situation, the injured may be grouped into four main categories for evacuation from the accident site.

- 1** Those casualties who clearly have trivial injuries and who, in the ordinary course of events, would probably not seek medical treatment, e.g. minor bruises or abrasions, fright, slight headache, etc. These casualties can be instructed to leave the accident area unassisted or with a friend and to return to their own homes after registration.
- 2** Those casualties who have injuries that would benefit from some medical treatment but who do not require immediate hospitalization, e.g. ankle sprains, large bruises and abrasions, back strain etc. These casualties can be evacuated

to their homes, after registration in the care of friends, and instructed to seek early treatment from their own medical practitioner.

- 3** These are the casualties whose injuries require early transport to hospital. Some will require desperately urgent surgery in order to survive, whereas others can afford to wait until the more seriously injured have been treated. Casualties categorized in this group can be further subdivided into priority cases, according to the need for urgent surgical treatment.

Priority 1 (requiring urgent transport to hospital):

- casualties with breathing difficulties e.g. flail chest, pneumothorax, obstructed airway
- casualties with severe bleeding, abdominal injury with signs of shock, open fractures, crush injury, burns of 30% or more of body surface
- casualties with head injuries and deteriorating level of consciousness
- casualties with multiple injuries.

Priority 2 (requiring surgery within a few hours):

- unconscious casualty with a clear airway
- abdominal injury without signs of shock
- large wounds in which bleeding has been controlled
- burns of 10% to 30% body surface
- dislocations of major joints.

Priority 3 (requiring surgery when possible):

- closed fractures
- facial injuries without airway obstruction
- eye injury
- minor wounds
- burns of less than 10% of body surface
- spinal injury.

- 4 Those casualties who are clinically dead or who are probably going to die before reaching hospital, e.g. those who have been cut in half, or whose skull and brain have been blown apart. The triage officer has to be realistic in selecting casualties for early evacuation. He must not jeopardize the survival of those with a chance of recovery by utilizing ambulance and hospital resources for the untreatable because of misplaced concern or fear of making an error. Group 4 casualties are the last to be evacuated.

First aid management

It is important to appreciate that casualties classified in Groups 1 and 2 ought still to receive appropriate first aid management, if possible, prior to evacuation. It is, however, equally important to appreciate that such casualties should not be allowed to crowd a hospital emergency area or an accident site. In a mass casualty situation they are more likely to receive early medical treatment at home or at a remote medical facility than they are if transported to the hospital receiving the more seriously injured.

Negative (or reverse) triage

In most mass casualty situations, the ambulance and hospital services are able to cope. However, in certain situations, e.g. a nuclear explosion or an earthquake in a remote location, the volume of casualties may exceed the capacity of the medical and rescue services.

In a disaster, a triage officer may have to make a choice between who to save and who to leave, perhaps to die. This unenviable task is one that can only ever be properly performed by an experienced medical practitioner.

The principles of triage remain the same except that the triage officer would then have to decide to give priority for evacuation to casualties whose injuries are such that they can be rapidly treated with a good chance of permanent cure rather than to those whose injuries would be time-consuming to treat with the likelihood of permanent disability.

In a disaster situation, therefore, the order of priority may be 'reversed' so that the least seriously injured are evacuated before the most seriously injured.

Glossary

Abdomen	part of the body between the chest and the pelvis, containing digestive organs
Afterbirth	the placenta, cord and membranes expelled after delivery of the baby
Airway	the passage by which air enters and leaves the lungs
Alveoli	air sacs in the lungs
Anus	the external opening of the rectum
Artery	a vessel carrying blood away from the heart
Assessment	the first aider's evaluation of the casualty's condition, indicated by the history, symptoms and signs
Autonomic nervous system	the branch of the nervous system that works without conscious control
Bladder	a sac acting as a reservoir, e.g. urinary bladder (for urine), gall bladder (for bile)
Blood pressure	the force exerted by the blood against the wall of an artery; the force to circulate the blood
Bone marrow	interior of bone, producing blood cells
Bowel	part of the digestive canal below the stomach and duodenum

Breastbone	the flat bone which forms the middle of the front of the chest and which separates the ribs
Bronchi	large air passages that divide from the windpipe
Capillaries	the smallest blood vessels
Carbon dioxide	the gas we breathe out
Cells	the 'building blocks' from which the body is made
Circulation	the movement of blood through the body
Coccyx	the tail bone — the lowest part of the spine
Contusion	a closed wound caused by a blow from a blunt object
Corked thigh	bruised thigh
Cornea	the 'window' of the eye
Cranium	the skeleton of the head, excluding the face and jaws
Diaphragm	the dome-shaped muscular wall separating the abdomen from the chest cavity
Digestive glands	the salivary glands, liver, gall bladder and pancreas
Disc	a layer of fibro-elastic tissue between two vertebrae
Dislocation	an injury where the bones of a joint are pushed out of normal contact with each other

Drug	a substance which exerts a special effect on cells or tissues or the body as a whole
Faeces	waste food products passed by the bowel
Floating ribs	two pairs of ribs that do not join at the breastbone
Gall bladder	a sac in the upper abdomen for storing bile
Genitals	the reproductive organs
Glands	organs that secrete specific substances
Gullet	the passage from the back of the throat to the stomach
Hallucinations	belief in imaginary sights and sounds
Hallucinogen	a drug that causes hallucinations
Heart	the hollow muscular organ responsible for pumping blood
Intestines	the lower part of the alimentary canal
Larynx	the voice box
Ligaments	tissues connecting bones at joints
Lungs	the pair of breathing organs in the chest cavity
Mallet finger	injury to the terminal joint of the finger
Microorganisms	germs
Mucus	sticky fluid from some parts of the body, e.g. the nose, bronchi
Negative (reverse) triage	used in a disaster situation; the least seriously injured are evacuated before the most seriously injured

Nerves	tissues that convey impulses from one part of the body to another
Neurotic	a condition in which a person imagines or magnifies symptoms
Obstructed	blocked
Organ	tissues grouped together to perform a special task
Oropharyngeal airway	a device used to assist in establishing and maintaining an adequate airway
Oropharyngeal aspiration	aspiration of fluid from the mouth and nose to prevent inhalation, and to obtain and maintain an unobstructed airway
Oxygen	a gas contained in the air which we breathe
Pancreas	a gland that produces insulin and alkaline digestive matter
Perineum	the pelvic area between the genitals and the anus
Placenta	special tissue attached to the mother's uterus that nourishes the unborn baby
Plasma	the fluid component of blood
Platelet	a component of blood involved in the clotting process
Psychotic	a condition of severe mental illness
Pulse	the transmission of the heartbeat felt in various parts of the body
Pupil	the opening in the centre of the iris of the eye

Rectum	the final section of the alimentary canal ending in the anus
Red cells	carry oxygen and carbon dioxide in the blood
Respiration	breathing
Sacrum	the solid bony mass at the base of the spine which supports the pelvis
Saliva	secretions in the mouth
Sedative	a drug to calm the nerves and promote sleep
Shoulder blade	the flat bone of the back jointed with the bone of the upper arm
Side-effects	the unintended effects of taking a drug
Skeleton	bones of the body
Skull	the bony framework of the head, enclosing and protecting the brain, and consisting of the cranium and the facial section
Spinal cord	the bundle of nervous tissue extending from the base of the brain; and surrounded and protected by the spine
Spleen	an organ in the abdomen
Sprain	stretching of the ligaments
Sternum	breastbone
Stomach	an organ in the abdomen
Suicide	on the point of taking one's own life
Tissue	a group of cells that performs a special function, e.g. the lining of the mouth

Trachea	windpipe
Triage	classification and sorting of casualties for management and evacuation, according to the degree of urgency
Umbilical cord	the cord attaching the baby to the placenta and the mother
Unconsciousness	a condition in which the brain fails to respond to the messages sent to it
Ureter	the tube leading from the kidney to the bladder
Vagina	the passage leading inwards from the external female genitalia
Veins	vessels that carry blood towards the heart
Vertebrae	(singular: vertebra) the individual bones that make up the spinal column
Voice box	part of the windpipe where the vocal cords are situated
White cells	blood cells which combat infection
Windpipe	the air passage between the throat and the lungs

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CONGRATULATIONS

on completing your
**St John Ambulance
first aid course!**

So, now you're a first aider... what next?



You are now one of the growing band of people throughout Australia with a good basic knowledge of the principles of first aid for the injured and distressed.

We hope that you never have to use your first aid skills. But if you do you will now find it easier to be a good Samaritan.

So where do you go from here?

- Every two or three years you should update your first aid skills.
- You can build on your current knowledge by doing a higher level course such as an Advanced Certificate.
- You can improve your skills in a specific area by doing a specialist course. These courses differ from State to State and may include first aid for divers, the care of patients in the home or first aid in remote areas.
- You can enhance your skills by doing special occupational first aid training.

But there is another door now open for you...

If you feel that you have benefited from your course and if you believe in the St John aim of bringing first aid to the people, why not consider becoming a member of the St John Operations Branch?

Who is in the Operations Branch?

They are the uniformed St John aiders you regularly see in attendance at sporting matches and other public functions. Their volunteer work is vital to the community.

What does membership involve?

- You offer some of your spare time to work as a volunteer first aider.
- You get further free training.
- You join a uniformed group with a co-ordinated approach to its duties.

- You join an organisation with a commitment to care and a system of recognition for the work that you do and the responsibilities you bear.
- You become part of a group with the common interest of providing first aid to the community—and you'll meet new people and enjoy the comradeship and team spirit they share.

St John Ambulance Australia is a national organisation active in every State and Territory.

We need people who care, to continue our work in helping all those who are injured, sick or in distress.

Use your skills to help others.

FIRST AID SAVES LIVES

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