



**St John  
Ambulance  
Australia**

**Skills Maintenance  
Programme**

**1993**

# FEEDBACK SHEET

## SKILLS MAINTENANCE PROGRAMME, 1993

Now that you have completed the 1993 Programme, please fill in this evaluation form. The Operations Branch members responsible for writing the Programme need your views so that they can be taken into account in preparing future editions. Please complete the questions below:

1. How useful did you find the Programme in increasing your knowledge?

*Circle the appropriate number on the scale below:*

Not useful    1   2   3   4   5   6   7    Very useful

2. How useful did you find the Programme as a training experience?

Not useful    1   2   3   4   5   6   7    Very useful

3. Which Module was the most useful?

4. Which Module was the least useful?

5. How would you rate the value of the skills sheets and exercises to you?

Very poor    1   2   3   4   5   6   7    Very good

6. What difficulties did you have with the Programme?

.....

.....

.....

.....

7. How could the Programme be improved?

.....

.....

.....

.....

Other Comments: .....

.....

.....

.....

Name ..... District .....

Please return the feedback sheet by 30 November 1993. Carefully tear this page off and make it into a reply paid envelope. Send it to Assistant Secretary (Operations), PO Box 3275, MANUKA, A.C.T. 2063. Fold it along the lines as shown below so that the address and plain space are outwards and place small pieces of sticky tape (not staples, pins or glue) to close the three open sides.

Many thanks,

J. Fred Leditschke  
Chief Surgeon

..... *Fold along this line* .....

No postage stamp  
required if posted  
in Australia

REPLY PAID 24  
Assistant Secretary (Operations)  
St John Ambulance Australia  
P.O. Box 3275  
MANUKA ACT 2603

..... *Fold along this line* .....



**St John Ambulance Australia**  
**OPERATIONS BRANCH**

# **Skills Maintenance Programme**

## **1993**

Name .....

Signature .....

Division .....

Date .....

St John Ambulance Australia  
Canberra Avenue  
Forrest ACT 2603

© St John Ambulance Australia 1992

This book is copyright. Apart from any fair dealings for purposes of private study, criticism or review, as permitted under the Copyright Act, no part may be reproduced without written permission. Inquiries should be made to the publisher.

Editor: Barry Price  
Production management: Terrence E Jeff  
Typesetting: Megatype Pty Limited  
Printing: Kingsway Printers Pty Limited

# Contents

<i>Page</i>		<i>Completed</i>	
		<i>Signature</i>	<i>Date</i>
7	<b>Module 1</b> Advanced Resuscitation Skill and Equipment		
17	<b>Module 2</b> Approach to and Examination of a Conscious Casualty		
20	<b>Module 3</b> Respiratory Distress and Chest Injuries		
30	<b>Module 4</b> Spinal Cord Injuries		
40	<b>Module 5</b> Medical Emergencies: Diabetes and Epilepsy		
48	<b>Module 6</b> Infection and Communicable Diseases		
59	<b>Module 7</b> Exposure to Temperature Changes		
66	<b>Module 8</b> Dressing Techniques		
69	<b>Module 9</b> Childbirth		

**Note:**

'A.F.A.' refers to *Australia First Aid*, Volumes One and Two, 1989.

'A.R.C.' refers to the Australian Resuscitation Council *Policy Statements*.

# *Welcome to Skills Maintenance Programme 1993*

---

The main reason for our existence as an organisation is the delivery of first aid. The Skills Maintenance Programme sets out not only to test the skill and knowledge of what has been learned in Senior First Aid as covered in *Australian First Aid*, Volumes One and Two, but to broaden the member's knowledge. Anatomy and physiology are included for those who wish to know a little bit more about how our bodies work. Other members want to know the reasons why we deliver first aid in the manner in which we do and this is covered in what is called the pathophysiology of injuries, diseases and disorders. It is hoped that by covering first aid measures in greater detail and depth, that we can satisfy the interests and desires of members to know a little more about the whys and wherefors of what they are doing when they deliver first aid care to a casualty.

Included in the Skills Maintenance Programme is a core of knowledge that must be known and must be passed by all members each year. This is certainly the case in relation to cardio-pulmonary resuscitation - a skill which we rarely need to use but need to keep at a very high level for that occasion when it is needed.

The Skills Maintenance Programme does cover information over and above that covered in *Australian First Aid*, Volumes One and Two. Extra knowledge will include history of the Order of St John, the regulations under which we operate and recognition of insignia indicating rank, qualifications or previous experience within the Cadet movement. First aid skills approved by the Australian Resuscitation Council (A.R.C. Policy) are also included, such as the lateral chest thrust for the non-breathing patient with a foreign body obstructing the airway.

All material included in the Skills Maintenance Programme has been approved by the Director of Training to ensure that matters being taught to the Operations Branch do not put members at risk of litigation by stepping outside what is approved St John policy.

In relation to litigation and the risk of being sued, by what is known as the Statute of Limitations, it is vital that Casualty Report records (previously BF43 and BF45 and now OB11 and OB12) be kept for a minimum of seven years. Members completing a Casualty Report form should ensure that the blue copy is filed carefully in their own personal files in case they later are called to answer for their actions in court. This is why it is so vital that

members record accurately the history elicited from the casualty or bystanders, document the findings on primary and secondary examination of the patient and clearly outline the treatment and the recommendation given to the casualty or those caring for the casualty - be it at home, hospital or local doctor.

At the completion of most modules, a Training Branch Accredited Instructor, who in most cases will also be a member of the Operations Branch, will sign the module. Where such a person is not available or where the matter being covered is applicable only to Operations Branch members, a Professional Officer or a Divisional Officer may be the most appropriate person to sign the module. All Divisions by June 1993 will be required to have a Training Branch Accredited Instructor as a member of their Division. Where by illness or transfer such a person is not available in a Division, the District Surgeon or his/her nominee will be required to assist in obtaining a suitable Accredited Instructor. This process will ensure that on completion of the Skills Maintenance Programme for three successive years, the member will be entitled to the issue or re-issue of a Training Branch Medallion Certificate. Many members will have obtained a Medallion Certificate by attending Training Branch courses or courses run within their Districts before the three years have elapsed.

Delivery of safe, competent first aid is our reason for existence and quality rather than quantity will provide an organisation of which we are justly proud to be members.



J. Fred Leditschke  
Chief Surgeon

### ***National Skills Maintenance Programme Training Committee Members***

Sr Barbara Davis	Chief Nursing Officer
Mr Wayne Deakes	Corps Officer
Dr Nadine Fisher	Corps Surgeon
Mr Gavan Keane	Divisional Ambulance Officer
Sr Diana McErlain	Divisional Nursing Officer
Sr Correne Wassertheil	District Nursing Officer

# Procedure

---

## ***A. St John Members***

1. Each member, on receipt of his/her own copy of the Programme, should sign and date the title page of the Programme.
2. The Programme is divided into modules, with theory and practical skills components.
3. All the skills must be practised and, when mastery is obtained, be signed by the appropriate person as indicated.

## ***B. Officers/Training Personnel***

1. Unless exempted under General Regulations, all officers/members of Operations Branch shall complete the Skills Maintenance Programme to the standard prescribed.
2. The term 'training personnel' refers to all St John members/officers with a designated training function. If professional training personnel are unavailable within a Division, then the Officer-in-charge should communicate the name and qualifications of a nominee to fill the role to the District Surgeon for consideration. All such requests will receive written advice.
3. All officers and/or Training Branch Accredited Instructors are responsible and accountable for the modules of the training programme they have signed as being satisfactorily completed.
4. Practical skills items pertaining to the module being undertaken must be signed as satisfactory by one of the designated persons.
5. If, on conclusion of the training module, the member is found to be unsatisfactory, then further training will be given, and another date and time for the assessment will be arranged.
6. On satisfactory completion of the module by the member, the programme is to be signed and dated in the space provided at the end of the relevant section.

This programme belongs to all officers and members of St John and its success depends on all working as a team. Your assistance and comments are always appreciated. A feedback sheet, which can be folded, closed up and returned as a reply paid envelope, is provided for those comments.

# *Advanced Resuscitation Skill and Equipment*

**OBJECTIVE:**      **1.1** On completion of this training module and after practising the practical skills listed below, to a satisfactory performance level as per the module, Operations Branch members will be able to apply one or more of these skills to a mock practical incident.

## **Practical Skills**

1. Two person cardio-pulmonary resuscitation (C.P.R.);
2. Insertion of an oropharyngeal airway;
3. Use of soft bag on a non-breathing casualty.

### ***1.1 Cardio-pulmonary resuscitation***

Checklist	Tick
<p><b>Dangers</b> Look around and listen for hazards. If the casualty is in a hazardous location he/she should be moved or the hazard removed before continuing.</p>	
No dangers. Yell for help.	
<p><b>Response</b> “Can you hear me?” “Open your eyes.” “What is your name?”</p>	
Kneel beside casualty’s shoulders; shake gently by grasping the casualty’s shoulders.	
No response: quickly turn the patient into stable side position.	
Place the far side arm at right angles to the body. Place the other arm across the chest.	

Checklist	Tick
Bend the nearest knee to bring the thigh at right angles to the body. Place your hand under the casualty's neck and support the head.	
Roll the casualty onto his/her farther side. Turn the face slightly downwards to ensure drainage of fluid.	
<p><b>Airway</b></p> <p>Check that the airway is clear.</p> <p>Open casualty's mouth.</p> <p>Look inside the mouth for foreign matter.</p> <p>Scoop with fingers, being careful not to push matter further in. <i>A.F.A., Vol. 1, p. 32</i></p> <p>Remove dentures only if loose.</p> <p>Airway clear.</p> <p>Open the airway. <i>A.F.A., Vol. 1, p. 33</i></p> <p>Tilt head backward.</p>	
<p>Place one hand on the forehead. Other hand to support the jaw at the point of the chin. Tilt the head backward (<b>not the neck</b>). <i>A.F.A., Vol. 1, p. 33</i></p> <p>Ensure the face is turned slightly downwards to enable fluids to drain from the mouth.</p>	
<p><b>Breathing</b></p> <p>Check to see if the casualty is breathing by observing for signs of respirations.</p> <p>Look for movement of the lower chest/upper abdomen.</p> <p>Listen and feel for air movement. <i>A.F.A., Vol. 1, p. 34</i></p>	
<p>No movement found.</p> <p><b>Note:</b> It may be difficult to hear movement of air if there is background noise, so it is important to follow the sequence - look, listen, feel.</p>	
<p>No breathing.</p>	
<p>Quickly turn the casualty onto his/her back while supporting the head and neck.</p> <p>Now commence expired air resuscitation (E.A.R.) or use intermittent positive pressure ventilation (I.P.P.V.).</p>	
<p>Kneel beside the casualty's head. Open the airway.</p> <p>Backward head tilt.</p> <p>Place the palm of one hand on the forehead. <i>A.F.A., Vol. 1, p. 35</i></p> <p>Support the jaw with pistol-grip between the knuckle of the middle finger and the thumb.</p> <p>Firmly but gently tilt the head backwards (<b>not the neck</b>).</p> <p>Lift the jaw upwards and forward at the same time.</p> <p>Avoid excessive force.</p> <p>The airway always takes priority over any injury, including a spinal injury.</p> <p>Seal the nose.</p> <p>Pinch the nose with the thumb and index finger of the hand supporting the forehead, or seal by pressing your cheek against the casualty's nose. <i>A.F.A., Vol. 1, p. 35</i></p>	

Checklist	Tick
<p>Take a deep breath.</p> <p>Apply your mouth over the casualty's open mouth.</p> <p>Blow to inflate the lungs. <i>(A.R.C./C.P.R. p. 10).</i></p> <p>Give five quick full effective ventilations with your expired air within ten seconds.</p> <p>Chest should rise - indicating air has entered the lungs.</p> <p>Quickly remove your mouth.</p> <p>Turn your head to the side to observe the casualty's face.</p> <p><b>N.B.</b> A Laerdal pocket face mask or Air Viva is to be used if available and gloves donned prior to checking for foreign bodies in the mouth.</p>	
<p><b>Circulation</b></p>	
<p>Check for presence of carotid pulse while maintaining backward head tilt.</p>	
<p>Use the flat pulps rather than the fingertips, as the fingertips are less sensitive.</p> <p>The thumb is not used as it is even less sensitive.</p>	
<p>Use two or three fingers along the line of the carotid artery, between the Adam's Apple and the large muscle of the neck.</p> <p>Check for five seconds.</p>	
<p><b>Recognition of Cardiac Arrest</b></p>	
<p>A collapsed victim has had a cardiac arrest if he/she is unconscious, not breathing and has no carotid pulse. <i>A.R.C., 6.2, Mar. 1988.</i></p>	
<p>Commence cardio-pulmonary resuscitation (C.P.R.)</p>	
<p>A second person kneels beside the casualty's chest. <i>A.F.A., Vol. 1, pp. 39-40</i></p>	
<p><b>External Cardiac Compression (E.C.C.)</b></p>	
<p><b>Locate compression site:</b></p> <ul style="list-style-type: none"> <li>- Locate upper border of sternum by feeling groove in midline between collar bones (clavicles).</li> <li>- Locate lower border of sternum by feeling lower ribs at the rib junction in the midline with the bony sternum.</li> <li>- Use the caliper method to locate and mark the centre of the sternum.</li> <li>- Place the first finger of each hand at the upper and lower borders of the sternum.</li> <li>- Bring both hands down so that the thumbs rest on the centre of the sternum. The position for the hands is between the thumb and finger of the lower hand.</li> <li>- Place the heel of one hand centrally over the lower half of the sternum against the central marker thumb.</li> </ul>	
<p>Keep palm and fingers off the ribs of the chest wall and only on the sternum.</p> <p>Cover first hand with other hand; either grasp the wrist of the lower hand with thumb of upper, or interlock the fingers of both hands.</p>	
<p>Press downward through the heel of the lower hand.</p>	
<p>Keep compressing arm straight and vertical so your body weight is the compressing force.</p>	

Checklist	Tick
Squeeze down firmly, keeping arms straight. Release quickly with equal time for compression and relaxation. <i>A.F.A., Vol. 1, p. 40 A.R.C. 89 Update. p. 17.</i>	
Press firmly (4-5 cm) for an adult casualty.	
Press rhythmically. Do not use rocking movements, thumps, or quick jabs.	
The action is compression rather than massage; hence the unacceptability of the term 'external cardiac massage'.	
Pivot from the hips and not the knees.	
Release the pressure to allow proper expansion of the chest, but do not remove hands from the chest.	
Aim is generate a pulse by compression of the heart and forcing blood up the carotid arteries.	
Give 5 compressions immediately in 4 sec.	
<b>Compression Rate:</b> One compression every 3/4 of a second, i.e. 75 compressions per minute or 5 compressions in 4 seconds. <i>A.R.C., 1988, p. 17</i>	
<b>Ratio:</b> Interpose 1 ventilation after every 5 compressions. <i>A.F.A., Vol. 1, p. 52</i>	
<b>Cycles per minute:</b> 15 cycles of 5:1.	
<b>Achieve:</b> At the end of each minute a compression rate of 75 per minute must be achieved.	
<b>Effective Standards:</b> - 15 ventilations/min. - 75 compressions/min.	
<b>Monitor Effectiveness</b> Regular revival check (A.B.C.). After 1 minute (15 cycles). Every 2 minutes thereafter (30 cycles). Continue until medical aid arrives. (Pulse and respiration do not return with this incident).	
<b>Note:</b> If the casualty vomits, stop, turn onto his/her side and clear airway before resuming E.C.C. or C.P.R. If a rib cracks and fractures during resuscitation efforts, continue; it is better to have a survivor with a broken rib than one who is dead and intact. The older the casualty the less elastic the bony skeleton.	
<b>Two Person C.P.R.</b> The rate of external cardiac compression (E.C.C.) in two person C.P.R. should be performed at a rate of 75 external cardiac compressions per minute opposed to 1 person C.P.R. at a rate of 60 external cardiac compressions per minute.	
Cycles per minute: 15 cycles of 5:1 per minute	

Practical skill mastered

Signed .....

Date .....

## Oropharyngeal Airway

---

Reference: *Occupational First Aid*.

An oropharyngeal airway is a device used to assist in establishing and maintaining an adequate airway in a comatose or deeply unconscious casualty who has lost the protective cough and gag reflexes in the throat.

### ***Indications for Use:***

For use on a comatose or deeply unconscious breathing/non-breathing casualty.

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 and respiratory obstruction.

**N.B.** If the casualty shows any signs of rejecting the airway or retching, remove the airway at once.

Ensure that the casualty's airway is clear.

To obtain the correct size oropharyngeal airway for the casualty, place the airway on the casualty's face so it measures from corner of the lip to the angle of the jaw.

## 1.2 Insert An Oropharyngeal Airway (Manikin to be used)

Checklist	Tick
<p>Select appropriate size airway; to avoid damage to the manikin, an infant airway should be used in learning this skill.</p> <p>Check that casualty has a clear airway.</p> <p>Open casualty's airway by head tilt/jaw support method.</p> <p>Maintain head tilt and keep casualty's mouth open.</p> <p>Pick up the airway by the flanged end and position it so that the convex curve is against the casualty's bottom lip.</p> <p>Insert the airway between the tongue and roof of the mouth until half the airway is in the mouth.</p> <p>Rotate the airway between the tongue and roof of the mouth until half the airway is in the mouth.</p> <p>Rotate the airway 180° and slide into the mouth fully.</p> <p>Check that the bottom lip is not curled.</p> <p>Check that the lumen (hole) of the airway is clear. Use suction if it is blocked.</p> <p>Check that air is moving freely through the airway.</p>	

Practical skill mastered

Signed .....

Date .....

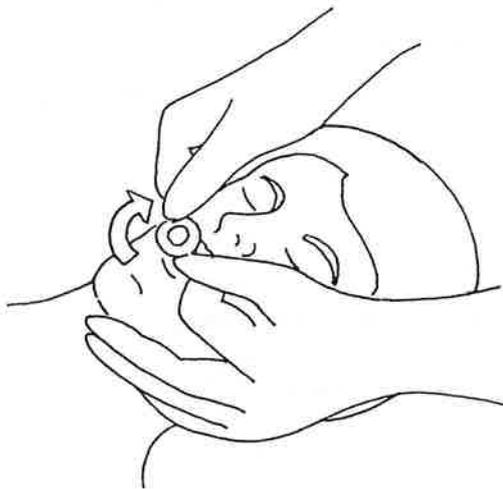
## Inserting An Oropharyngeal Airway



**Fig. 1** Obtain correct size airway by comparing the airway chosen with the distance from the corner of the lips to the angle of the casualty's jaw.



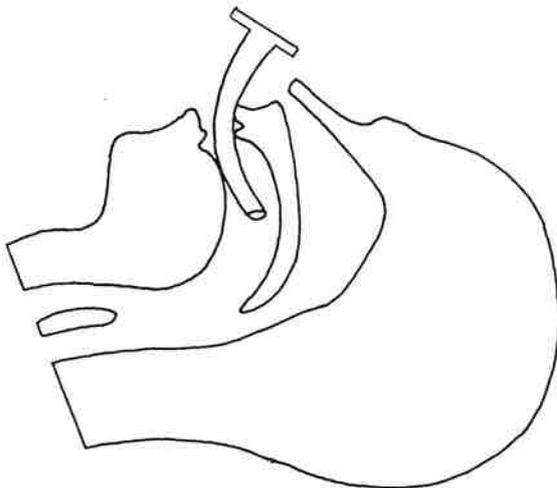
**Fig. 2** Using cross-finger technique to hold the mouth open, insert airway to one-third of its length.



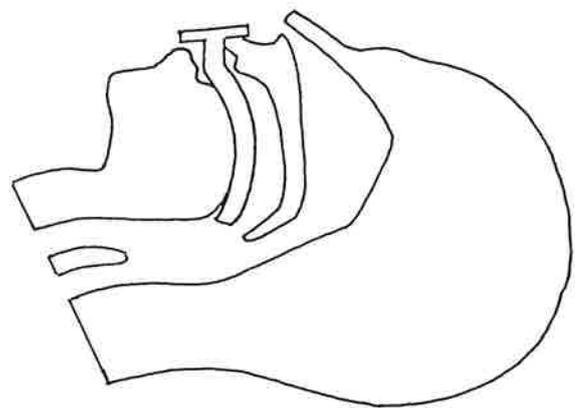
**Fig. 3** Rotate airway 180° and gently push into casualty's mouth.



**Fig. 4** Tilt the casualty's head and, if necessary, apply jaw thrust.



**Fig. 5** Initial insertion



**Fig. 6** Final position.

### 1.3 Use a soft bag resuscitator on a non-breathing casualty

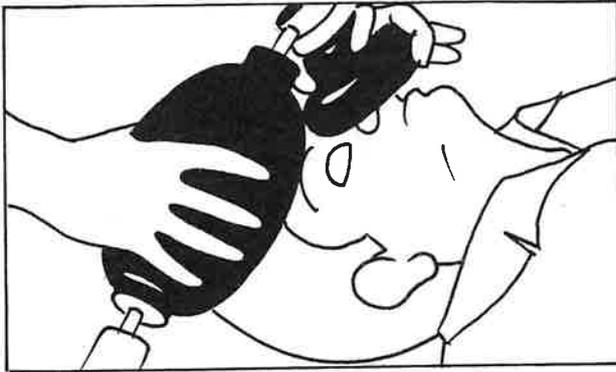
Checklist	Tick
<p>Kneel at head of casualty.</p> <p>Check and clear airway.</p> <p>Open airway.</p> <p>Insert an Oropharyngeal Airway if available.</p> <p>Choose appropriate size face mask (adult or child).</p> <p>Squeeze soft bag to check relief valve and exhalation valve.</p> <p>Place mask over casualty's face (narrow part over bridge of nose).</p> <p>Secure mask over casualty's face:</p> <ul style="list-style-type: none"> <li>- thumb over nose at top of mask;</li> <li>- index finger over base of mask;</li> <li>- other three fingers under the jaw, pulling it up and back.</li> </ul> <p>Check that the mask is firmly applied and that the head tilt is maintained.</p> <p>Squeeze the bag with the other hand and watch for the chest to rise; then release the bag.</p> <p>Squeeze the bag every 4 seconds (adult) or every 3 seconds (child).</p> <p>Check constantly that the equipment is functioning and that your technique is correct:</p> <ul style="list-style-type: none"> <li>- check that the mask maintains a tight seal;</li> <li>- check the rise and fall of the casualty's chest;</li> <li>- check constantly for evidence of vomiting;</li> <li>- monitor casualty for return of normal breathing.</li> </ul> <p>(Fit oxygen tubing to oxygen inlet nipple of the soft bag if this is possible with your equipment and supply oxygen at 6-8 litre/minute flow)</p>	

Practical skill mastered

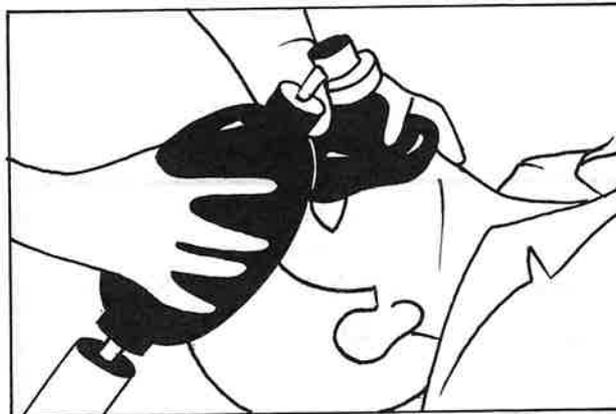
Signed .....

Date .....

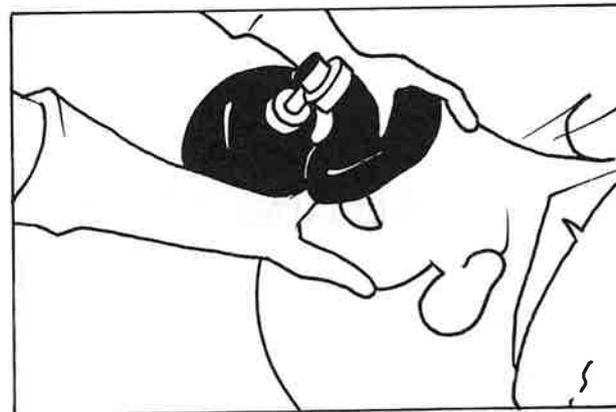
## Bag Valve Mask Application



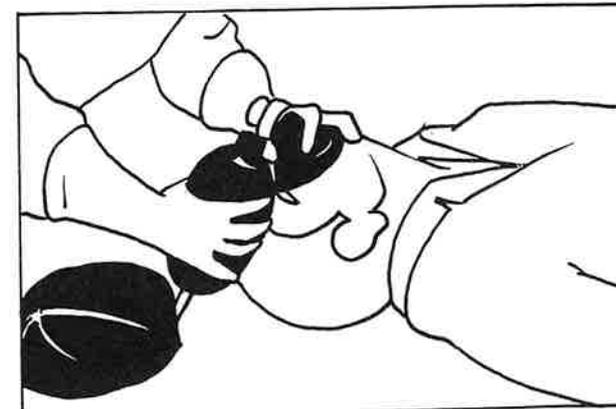
**Fig. 7** (a) Place the apex of the mask over the bridge of the casualty's nose and roll mask onto casualty's face.



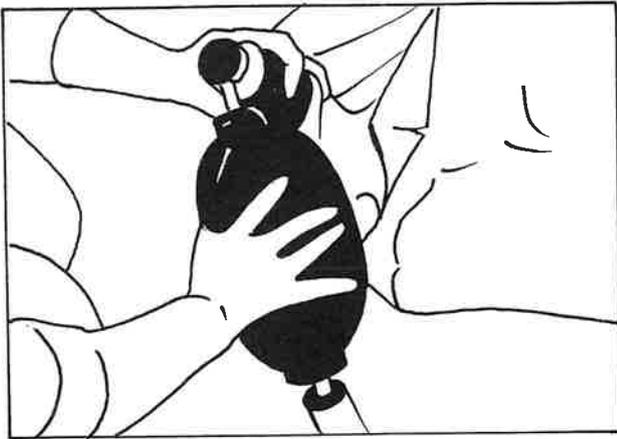
**Fig. 8** (b) Place the base of the mask in the space between the casualty's lower lip and chin. Firm downward pressure can now be applied to the mask to obtain a tight seal between the casualty's face and the face of the mask.



**Fig. 9** (c) Use the third, fourth and fifth fingers of the other hand to pull the chin up and backward; the casualty's head and neck will be in the extended position.



**Fig. 10** (d) Use the thumbs and index finger to maintain a good seal, with firm pressure applied to the mask.



**Fig. 11** (e) With four fingers on top of the bag and the thumb underneath, squeeze the bag and look for rising in the chest. Failure to rise may mean a poor seal or obstruction in the mouth or air passage.

***Skills Mastered***

Satisfactory

Fail

Re-test




EXAMINER Please tick  
Please sign and print name

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# *Approach to and Examination of a Conscious Casualty*

---

**PRESCRIBED REFERENCES:** *Australian First Aid*, Vol. 1 and 2, 1989.  
Supplementary Training Notes.

**OBJECTIVES** Having studied the relevant pages of the prescribed text and attended training sessions, the St John member will be able to:

- 2.1 Approach a casualty in a confident and safe manner.
- 2.2 Relate to the casualty as a person.
- 2.3 Manage the casualty's injuries, gently and carefully.
- 2.4 Examine a conscious casualty using the checklist.

---

## **Supplementary Training Notes**

---

When approaching an injured person, it is essential to introduce yourself in such a way that the injured person knows who you are and so can have confidence in your ability. So, when giving instructions to the casualty, speak firmly, quietly and with authority.

Always relate to the casualty as a person - not as a 'fractured femur', or a 'heart attack', but as **a person with a fractured femur or a person who has had a heart attack**. Find out the casualty's name so you can speak to him/her during treatment. Be aware of the emotional problems associated with injury or illness. For example, a small child with a fractured leg is more worried about what Mummy or Daddy will say, because the injury may have been caused by the child doing something he/she may have been told not to do. Teenagers may be more concerned about when they can play sport again or how the injury will affect their appearance. Young adults may worry about when or how quickly they can get back to work. Elderly people are usually worried about becoming confined to bed for a long period with complications of chest infections and the loss of their mobility and thus becoming dependent on others. It is just as important to look after the emotional needs of the casualty as it is the injury.

The relatives of an injured person can be of assistance if properly informed and advised by the first aider. They can provide information about the injured person and verify information already gained. A child may be more responsive if his/her mother or father is present.

## 2.1 Examination of a conscious casualty

Checklist	Tick
<p><b>D DANGERS</b></p> <p>On approaching casualty, <b>observe</b> the scene for DANGERS:</p> <ul style="list-style-type: none"> <li>- to yourself;</li> <li>- to others;</li> <li>- to the casualty.</li> </ul>	
<p><b>R RESPONSE</b></p> <ul style="list-style-type: none"> <li>- responds;</li> <li>- clues for possible injuries.</li> </ul>	
<p>Speak to the casualty:</p> <ul style="list-style-type: none"> <li>- "Lie/stay still - don't move";</li> <li>- "I'm a first aider and I can help you";</li> <li>- "My name is .....";</li> <li>- "What is your name?"</li> </ul>	
<p><b>A AIRWAY</b></p> <ul style="list-style-type: none"> <li>- Ask casualty to open mouth; check if clear.</li> </ul>	
<p><b>B BREATHING</b></p> <ul style="list-style-type: none"> <li>- Yes - Check for chest movement</li> <li>- Ask the casualty what happened - "Tell me what happened."</li> </ul>	
<p><b>C CIRCULATION</b></p> <ul style="list-style-type: none"> <li>- Check for haemorrhage.</li> <li>- Explain to the casualty that you are going to examine them.</li> <li>- Place gloves on.</li> <li>- Treat any severe bleeding immediately.</li> </ul>	
<p><b>ASSESSMENT</b></p> <ul style="list-style-type: none"> <li>- Ask where pain is - "Where are you hurt?"</li> <li>- Investigate these painful areas.</li> <li>- Ask the casualty to explain to you in detail what he/she remembers about the incident.</li> <li>- "Tell me exactly what happened." This may lead you to further possible injuries. If casualty has only a vague recollection, suspect a period of loss of consciousness (L.O.C.).</li> <li>- Check the casualty for injuries consistent with the story.</li> </ul>	

Checklist	Tick
<ul style="list-style-type: none"> <li>- Ask a bystander who saw the accident to tell you exactly what happened. Compare the casualty's story with the bystander's story.</li> <li>- Ask casualty for previous medical history. (This may provide further clues to his/her condition or may influence later treatment).</li> <li>- Check remaining areas of the body systematically for function, unusual appearance, or feel which may indicate further injury.</li> <li>- Treat injuries according to order of severity. Reassure the casualty.</li> <li>- Record your observations of the casualty and the situation on the Casualty Report form.</li> <li>- Arrange for the casualty's disposal (medical aid, home or back to work, as appropriate).</li> </ul>	

Practical skill mastered

Signed .....

Date .....

<b><i>Skills Mastered</i></b>			
	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signed: ..... Date ..... / ..... / 1993			
Name: ..... Position: .....			
Qualification: (Please tick where appropriate)			
Doctor ..... Registered Nurse ..... Ambulance Officer .....			
Training Branch Accredited Instructor: .....			
Operations Branch Member (approved by District Surgeon): .....			

# *Respiratory Distress and Chest Injuries*

**PRESCRIBED REFERENCES:** *Australian First Aid*, Vol. 1, Chapters 12 and 14.  
Supplementary Training Notes.

**AIM:** To enable the St John member to recognise and administer appropriate emergency first aid for respiratory distress and chest injuries.

- OBJECTIVES:**
- 3.1 Name the causes of respiratory distress.
  - 3.2 Outline the symptoms and signs of respiratory distress.
  - 3.3 Demonstrate the management of fractured ribs.
  - 3.4 Demonstrate the management of flail chest.

## **Respiratory Distress**

### ***Definition***

Respiratory distress is difficulty in breathing or shortness of breath. It is usually acute but may be chronic with a pre-existing disease or disorder.

**History** about this episode of respiratory distress, or any previous episode, is vital.

### ***Symptoms and Signs***

The casualty may complain of any these symptoms:

- shortness of breath;
- choking feeling;
- “can’t get enough breath in”;
- “can’t take a deep breath”;
- chest feels tight;
- feeling wheezy;
- chest pains;

- cough;
- dizziness;
- pins and needles in hands and feet and around mouth.

## ***Signs***

There may be **minimal** signs of the casualty's respiratory distress or you may observe any of the following:

- increased respiratory rate;
- noisy breathing;
- laboured breathing (where the casualty's whole chest seems to heave with every breath);
- increased pulse rate;
- frothy or blood-stained sputum;
- anxiety, confusion or restlessness;
- evidence of chest injury;
- very shallow breathing, e.g. fractured ribs;
- cyanosis.

## **Treatment**

---

Often basic first aid or patient care treatment is all that is required (or possible) for respiratory distress. This includes;

- treatment of underlying injury (if possible);
- rest, reassurance and adopting the position of comfort;
- oxygen (if available):
  - . 6-8 litres per minute by mask;
  - . 3-4 litres per minute by nasal prongs;
- seek medical aid.

## **Causes**

---

Respiratory distress can be due to many conditions. Often it is caused by something quite apart from the chest or airways, e.g. stress or excitement; severe abdominal pain.

### **1. Medical Causes**

#### **(a) Upper Airway**

Any upper airway obstruction is a serious condition and requires urgent medical aid. The casualty will usually complain of a choking feeling, have shallow, noisy respiration and have difficulty in talking.

The usual causes are:

- swollen throat from infection, e.g. severe tonsillitis;

– swollen throat from an allergy, e.g. bee sting.

Ice packs to the throat may help. If the casualty is conscious, sucking an ice block may give some relief.

– foreign bodies.

Less frequent but diagnosis is vital as a foreign body may move, causing increasing respiratory obstruction.

See *Skills Maintenance and Re-examination Programme, 1992* for Management of Choking.

#### (b) Lungs and Chest

Chest conditions are often recurring and the casualty will often have a past history of respiratory distress, e.g. asthma. They may tell you the name of their disease, the tablets and treatment they require and the name of the hospital or doctor they usually attend.

In most cases, oxygen is the only active treatment available before the casualty reaches medical aid but the calm reassuring voice of the first aider will assist.

People known to be suffering from Chronic Obstructive Airways Disease (C.O.A.D.), e.g. chronic bronchitis or emphysema, should only be given oxygen if they are very cyanosed, restless and distressed. If given, the rate should be at or below 2 litres/minute.

For all these lung conditions the casualty will probably have the following signs and symptoms:

- shortness of breath;
- cough;
- wheeze (particularly in asthma).

The common conditions are:

- asthma;
- chronic bronchitis and emphysema;
- pneumonia;
- pneumothorax (air in the pleural space compressing the lung);
- pulmonary oedema (fluid on the lungs due to heart failure).

Overbreathing is not a lung condition and can be difficult to diagnose. It occurs usually in young people following a stressful situation, e.g. at a pop concert or following a car accident. The symptoms and signs are:

- rapid respiration, often sighing which 'blows' off excess carbon dioxide;
- complains of pins and needles in hands, feet and around mouth;
- cramps in the hands and feet, if there is prolonged overbreathing.

The treatment is firm reassurance and advice to the casualty to breathe in and out of a paper bag (slow, regular breaths), to restore correct blood gas levels.

#### (c) Non-respiratory Causes of Respiratory Distress

Respiratory distress can be a symptom of any serious medical condition, especially with the casualty in **severe pain** or in **shock**.

One of the first signs of shock - whether due to internal haemorrhage, overwhelming infection, extensive burns or severe pain - is an increased respiratory rate.

Other common causes of an increased respiratory rate are:

- heart attack
- snake bite;
- poisonings;
- drug overdose, e.g. paracetamol;
- stress, anxiety or excitement;
- diabetes - both in hypoglycaemia and hyperglycaemia.

## 2. Accidents and Injuries

### (a) Upper Airway

Anything that causes injury to the upper airway can be fatal and requires very prompt emergency treatment. Causes include:

- blows to the neck, e.g. kick at football;
- choking, e.g. from impacted food or foreign body;
- strangulation and hanging - accidental and suicidal;
- jaw and mouth injuries - sport, vehicular, falls;
- drowning;
- insect or venomous bites to the upper airway or neck;
- allergy to insect venom.

### (b) Lungs and Chest

Causes of chest injuries:

- blows;
- falls;
- crushing;
- stabbing;
- gunshot;
- blast.

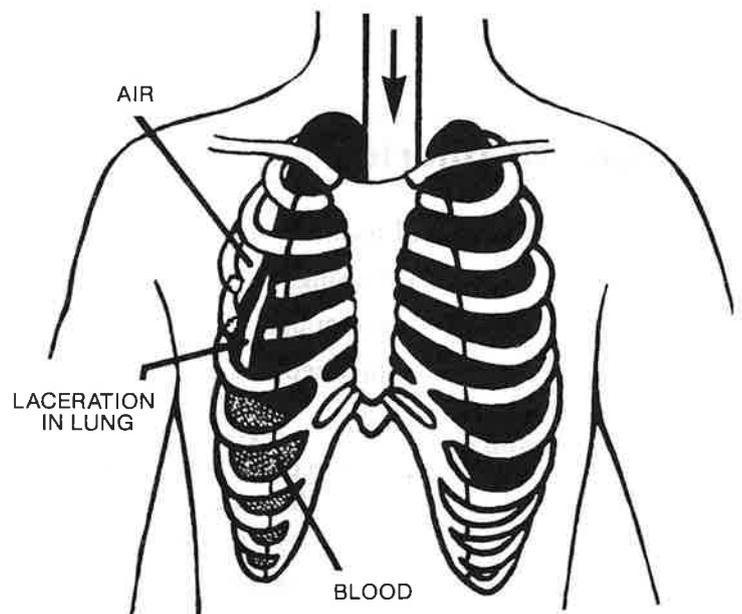


Fig. 1 Fractured ribs with lung damage

### Flail Segment

If several ribs are fractured at both ends, the segment of chest wall, instead of moving outwards on inspiration, will be drawn inwards, whilst the injured side moves outwards. This is called paradoxical breathing.

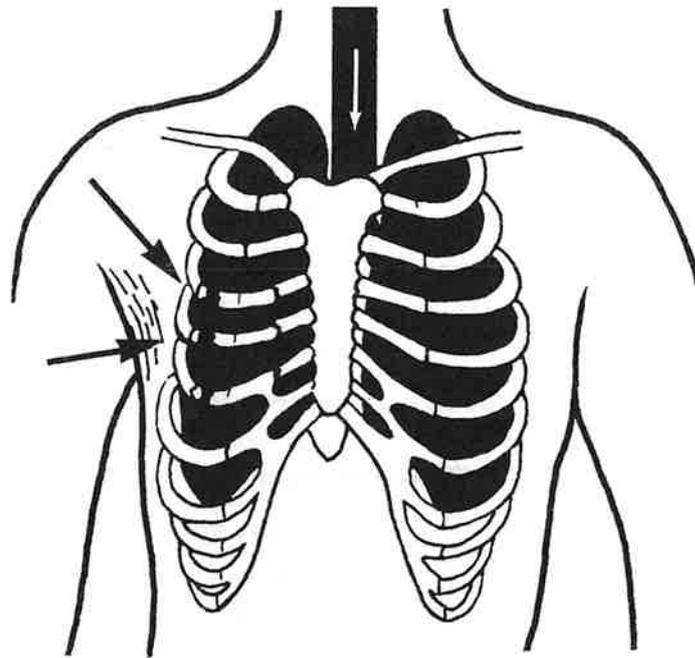


Fig. 2 Flail chest

The rib cage is very elastic and can withstand a great deal of force. However, once the rib cage has been fractured, the lung and other organs may be injured. Such injuries can be serious or even fatal. The lungs may be:

- bruised;
- compressed (by a flail segment);
- punctured (by a fractured rib).

Rib or sternum fractures may make breathing so painful that respiration is very seriously affected, particularly in someone who smokes heavily or has a previous chest problem, e.g. chronic bronchitis or asthma.

Other organs, such as the heart, liver or spleen, may be damaged in chest fractures. **Shock** may develop at any time.

## Types of Injuries

---

### Minor

- bruising;
- lacerations;
- fractured ribs.

### Major

- fractured ribs with complications:
  - . flail chest;
  - . injury to underlying structures;
- pneumothorax;
- haemothorax;
- haemo-pneumothorax;

- lung contusion;
- ruptured diaphragm;
- rupture of great vessels, e.g. aorta;
- tear to the liver with bleeding;
- tension pneumothorax;
- blast injuries;
- cardiac tamponade.

General signs and symptoms:

- obvious trauma (injury);
- chest or back pain at injury site;
- difficulty in breathing (dyspnoea);
- marked cyanosis of fingernails and toes, tongue, lips, ear lobes or mucous membranes of the mouth;
- failure of chest to expand normally during inspiration;
- cough, with or without frothy, bloody sputum;
- rapid weak pulse;
- blood pressure (taken by doctor, nurse or ambulance officer) falls;
- shock;
- pale and sweaty;
- sudden sharp pain which may be referred to (shoulder, across chest and to abdomen);
- deviation of larynx and trachea from midline;
- distended neck veins with cardiac tamponade as blood can't get back to the heart;
- purplish blue colour of head, neck and shoulders;
- sucking sound when casualty breathes in or out (rare).

### ***Emergency Treatment***

D – Check for dangers.

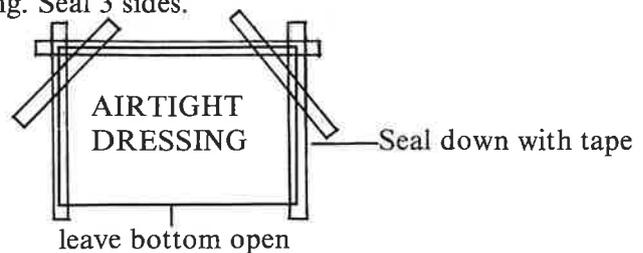
R – Talk to and reassure casualty who will be very distressed.

A – Check airway is clear; maintain an open airway and assist with breathing if necessary.

B – Note type of breathing.

C – Check pulse.

- Administer oxygen if available and if trained to use it.
- Open clothing to assess for open wounds (always check for exit wounds on the back and front).
- Seal any open sucking wounds.
- Place your hand or a pad over wound until an airtight dressing is available.
- Use an airtight dressing. Seal 3 sides.



(this acts as a one-way valve, allowing air to escape from the chest cavity but not to enter)

Fig. 3 Management of open sucking wound

- Do not remove any impaled objects.
- Care for any other bleeding;
  - . direct pressure;
  - . pad;
  - . bandage.
- Place casualty in a half sitting position, leaning towards the injured side or lying on the injured side, whichever the casualty finds more comfortable and allows the casualty to breathe more freely.
- Treat for shock.
- Monitor vital signs:
  - . airway - respirations;
  - . pulse;
  - . pupillary reaction;
  - . conscious state;
  - . if a doctor, nurse or ambulance officer, take and record blood pressure.
- Assess and treat any other injuries to casualty.
- Calm and reassure the casualty.
- Be alert for risk of vomiting and place on side to allow drainage.
- If casualty unconscious, place in stable side position, injured side down.

***Transport immediately - Urgent medical treatment is needed.***

***Definitions:***

1. **Cardiac tamponade** – blood or other fluid in the pericardial sac which surrounds the heart, exerting pressure on the heart and preventing venous return.
2. **Haemothorax** – blood leaks into the chest cavity from lacerated vessels or the lung itself and the lung becomes compressed.
3. **Hypoxia** – a condition in which the tissues of the body receive inadequate amounts of oxygen.
4. **Lung contusion** – usually caused by high velocity blunt trauma with bruising and bleeding into and from the lung, e.g. motor vehicle accident.
5. **Pericardium** – the membrane sac which holds the heart.
6. **Pneumothorax** – air enters the chest cavity through a sucking wound or leaks from a lacerated lung. The lung collapses and cannot expand.
7. **Signs** – what you observe or elicit on examination of the casualty.
8. **Symptoms** – what the casualties tell you they feel.
9. **Thorax** – the chest: the cavity which holds the heart and lungs.

### 3.1 Apply Triangular Bandages to a Casualty with Fractured Ribs

Checklist	Tick
<p>Check D.R.A.B.C.</p> <p>Check respiration and pulse rates.</p> <p>Check abdomen for tenderness or rigidity (signs of internal abdominal haemorrhage) unless the rib fractures are above the nipple line.</p>	
<p>If the casualty is conscious, place in half-sitting position, injured side down.</p> <p>Place soft padding over injured area.</p> <p>Ask casualty to fold his/her arms across the chest, thus holding the padding in place.</p> <p>Pass a broad bandage around the casualty's chest and upper arm on the injured side.</p> <p>Tie bandage firmly with a reef knot on front of the uninjured side.</p> <p>Place padding under knot.</p> <p>Apply St John sling to the supporting arm.</p>	
<p>Check that the casualty feels more comfortable and that breathing is not unduly restricted.</p> <p>Reassure the casualty by calm voice and gentle handling.</p> <p>Check pulse and respiratory rate (if it has risen, think of shock).</p> <p>If casualty is distressed, give oxygen.</p> <p>Write down your observations at regular intervals.</p> <p>Transport to medical aid.</p>	

Practical skill mastered

Signed .....

Date .....

### 3.2 Treat a Casualty with Flail Chest

Checklist	Tick
Check D.R.A.B.C. Check respiration and pulse rates. Check for paradoxical breathing. Check abdomen for tenderness or rigidity (signs of internal abdominal haemorrhage).	
If the casualty is conscious, place him/her in half-sitting position, injured side down. If unconscious, place in stable side position, injured side down.	
Place large dressing over flail segment. Tie one or two broad bandages firmly around the chest to secure the dressing. Splint the chest by using the arm on the injured side. The arm should be bent at the elbow, fingers pointing to the opposite shoulder and securely bandaged to the chest.	
Give oxygen if the casualty is distressed.	
Check that the casualty feels more comfortable with the bandage in position. Check pulse and respiratory rate constantly (if they rise, it may indicate shock developing). If casualty is distressed, give oxygen. Write down your observations at regular intervals. Seek medical aid urgently.	

Practical skill mastered

Signed .....

Date .....

***Skills Mastered***

	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

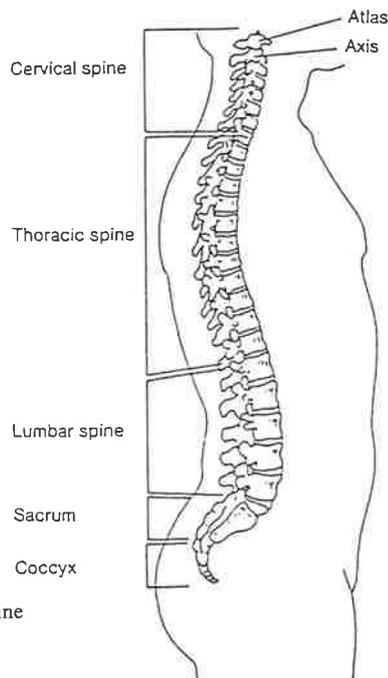
Operations Branch Member (approved by District Surgeon): .....

# *Spinal Cord Injuries*

**PRESCRIBED** *Australian First Aid*, Vol. 1, pp. 117-121, 1989.  
**REFERENCES:** *Australian First Aid*, Vol. 2, pp. 11-12 and pp. 90-92, 1989.  
 Supplementary Training Material.

## **Introduction**

A spinal cord injury is one of the most disabling traumatic conditions affecting individuals. It causes not only physical disability in the affected individual but also immense psychological impact upon the casualty, the casualty's family and friends. The age group mainly affected by spinal cord injuries is the adolescent and young adult. This group has a lifestyle that predisposes it to the types of situations that cause spinal cord injuries. In Australia, approximately 50% of spinal cord injuries are the result of road traffic accidents. Diving accidents are responsible for a further 10-12%. The remainder occur in the sporting, occupational and domestic environments.



**Fig. 1** The Spine

## ***The Vertebral Column***

The spinal column consists of a row of 33 individual bones called vertebrae which are aligned one on top of the other. The lowest four vertebrae are fused to form the coccyx and the five vertebrae immediately above the coccyx fuse to form the sacrum. The remainder are connected to each other by small joints formed by the bones themselves, together with ligaments and muscles which attach along the length of the vertebral column and in between the individual bones.

Each vertebra consists of a body and an arch. The body is largely weight bearing and the arch surrounds and protects the spinal cord. A vertebral body is separated from its neighbours by an elastic disc which essentially functions as a 'shock absorber'. The backs of the bodies and the arches of the vertebrae form a canal known as the spinal canal through which the spinal cord passes. The vertebrae and discs are attached to each other by a complex arrangement of ligaments and supported by several arrangements of muscle layers. The muscles, ligaments and discs provide stability and control movement. On each side of each vertebral arch just behind the vertebral body, the nerves to the body emerge.

## ***The Spinal Cord***

The spinal cord can be likened to a series or collection of electrical cables in which nervous impulses are transmitted in cables from the body to the brain and vice versa. These impulses either continue to be transmitted uninterrupted in their cables or are tapped by 'modulating mechanisms' or 'electrical sub-stations' and directed out to the body in order to cause or change a function. Sensory impulses are also received by each 'sub-station' and transmitted up the spinal cord to the brain for interpretation. The transmission cables from the cord to the body are called nerves and transmit impulses both ways.

The nerves described above carry motor, sensory and autonomic messages from the spinal cord to the extremities and vice versa. *Motor* nerves cause movements by initiating muscular contraction. *Sensory* nerves transmit sensations such as pain, temperature and touch from the extremities to the spinal cord. *Autonomic* nerves modulate the intensity of autonomic (or automatic) functions such as heart beat, sweating, respiration and digestion, depending upon the needs of the body at any point in time.

## ***Bony (Vertebral) Injury***

The types of injury that result in spinal cord damage are:

- fractures;
- dislocations;
- subluxations (partial dislocations);
- or combinations of the above.

These can be classified as stable and unstable. However, proper x-ray evaluation is required for classification and thus beyond the capability of a first aider at the scene of an incident. Therefore, all suspected injuries to the vertebrae must be considered to be unstable, likely to slip and cause more damage, and therefore treated as such.

## ***Spinal Cord Injury***

Following an injury which causes impaired spinal cord function, a wide spectrum of damage from minor bruising or swelling to total division of the spinal cord may result. However, it is impossible to predict the quantity and permanency of cord damage from the signs at the time of the accident. The fact that a person has no feeling and no movement does not mean that the cord is necessarily torn and will not recover. Therefore, all casualties with spinal cord signs must be treated as though the injury could recover. In addition, twisting or bending an injured spinal column may increase the cord damage caused at the time of the initial injury, or damage the cord even though it was not initially damaged.

An injury to the spinal cord will produce the following signs below the injured level:

- total or partial muscular weakness or paralysis;
- loss of or altered sensation;
- altered autonomic function control.

## ***Quadriplegia***

Quadriplegia is produced by a neck injury. It involves paralysis of the upper limbs, lower limbs and trunk muscles.

## ***Paraplegia***

Paraplegia is paralysis involving the lower limbs and some or all of the trunk muscles. It is the result of an injury involving any part of the vertebral column below the neck.

## ***Causes of Spinal Cord Injury***

The same mechanisms of injury causing fractures and dislocations apply. These are:

- direct force;
- indirect force;
- abnormal muscular action.

More specifically, the situations which result in spinal cord injuries are:

1. A fall from a height;
2. A direct blow to the spine including penetrating injury such as gunshot or knife wounds;
3. Jackknifing;
4. Diving or surfing accidents;
5. Sudden acceleration or deceleration to or from high speed, e.g. aircraft or high speed motor vehicle accidents or a blow to the forehead of a competitor running past during a sporting event.
6. Where a person becomes a projectile, e.g. a person knocked off a bicycle and propelled a distance or ejected out of a motor vehicle or from a motor cycle.

Spinal cord injury must be considered in all persons with severe head injuries or where an incident has resulted in the death of another victim.

# Assessment of the Injured Person

---

## *History*

The casualty and observers must be questioned as to what happened in addition to the mechanism and magnitude of the forces involved. The first aider must appreciate and recognise the various types of situations that potentially cause spinal cord injuries.

## *Presenting Features*

### **1. The Conscious Victim.**

#### **Symptoms:**

- Pain at or below the level of the injury.
- Absent or altered sensation below the injury, e.g. pins and needles.
- Absent muscular power or weakness below the injury.

#### **Signs of Bony Injury:**

- Tenderness over the injured area of the spinal column.
- Deformity of the spine is relatively uncommon and should not be looked for if cannot easily be felt when assessing the tender area.
- Swelling is usually minimal at the time of the injury and thus its absence does not exclude significant bony injury.

#### **Signs of Cord Injury:**

##### *Motor:*

- Reduced or absent muscle power on asking the casualty to move upper and/or lower limbs.
- A poor cough may indicate weak chest and abdominal wall muscles. In neck and upper thoracic spine injuries, paradoxical movement of the chest wall will be present. This is called paradoxical breathing, when instead of the chest expanding on inspiration, it moves inward and the reverse occurs as the casualty breathes out.

##### *Sensory:*

- There will be altered or absent sensation below the injury. It must be remembered that a neck injury affects the upper limbs.
- Compare limbs and trunk sensation with that of the face as the sensation to the face will not be affected by spinal cord injuries and is therefore normal.

##### *Autonomic:*

- The usual signs of shock (as haemorrhage) cannot occur as the nervous impulses that would produce these signs are interrupted. In neck and upper thoracic injuries, the exact opposite happens:
  - (a) The pulse rate is usually slow.
  - (b) The pulse strength is either weak or near normal.
  - (c) The skin remains dry but warmth and colour are variable. This is because blood vessels lose their ability to constrict as their nerve supply is not functioning.

- (d) A male casualty may have an erection as the penile blood vessels fill with blood because of the dilation of these blood vessels.
- (e) Breathing may increase in rate but its depth is commonly reduced owing to muscular weakness of the abdominal and chest wall muscles. Paradoxical breathing will be present. Cough will be poor.
- (f) Following injury, the stomach and intestine will stop absorbing its content. Thus there is a potential hazard of the victim quietly regurgitating whilst lying flat on the back and obstructing the airway with vomitus, or inhaling the vomitus.
- (g) The victim will be unable to evacuate or empty the bladder and bowel owing to paralysis of those muscles. This leads to retention of urine and the bladder may be palpable like a tennis ball in the midline lower abdomen.

## **2. The Unconscious Victim.**

Spinal cord injuries need to be suspected in all persons unconscious as a result of an injury. It is unlikely that a first aider, who is not skilled in assessing spinal cord injuries, will be able to confidently diagnose such an injury in an unconscious casualty. But that does not matter. The approach is that of an unconscious casualty. Whether that victim has a spinal cord injury or not does not matter until the dangers and life threatening problems have been assessed and treated. Thus, the unconscious and spontaneously breathing casualty will be on his/her side at the time of examination for other injuries.

The signs which may assist in making a diagnosis of a spinal cord injury in the unconscious victim could be some or all of the following:

- (a) a paraplegic will have loss of muscular tone in the lower limbs (floppy limbs) where upper limb tone is present;
- (b) a quadriplegic may have no response to painful stimuli in the upper limbs, lower limbs or trunk when a grimace is noted on testing for painful stimulus on the face;
- (c) dry skin in the presence of a slow, either weak or normal strength, pulse;
- (d) paradoxical breathing;
- (e) the presence of an erection in the male.

### **Internal Haemorrhage**

This must be suspected in all casualties who have suffered a spinal cord injury. The usual signs of blood loss do not occur in high spinal injury above the upper thorax.

### **Management of Spinal Cord Injury**

If the victim is unconscious at the time of initial assessment, follow the D.R.A.B.C. rule and place in the stable side position, in the usual manner. Then continue the examination of the casualty on the side. If **immediately** available, apply a cervical collar prior to rolling.

If the casualty is conscious:

- Reassure.
- Loosen tight clothing and ensure no hard objects are in pockets or underneath the casualty, to prevent pressure sores in areas now lacking normal sensation.

- Assessment should be brief and simple:
  - . Can the casualty feel one or more of the limbs?  
Sensory loss may be incomplete or involve only one side of the body.
  - . Can the casualty feel some, or all, of the trunk?  
If not, where does it change?
  - . Ask the casualty to shrug the shoulders, flex the elbow, move the fingers and make a fist.
  - . Ask the casualty to flex the hip, bend and straighten the knee and bend the foot up and push it down again at the ankle.
- Do not move the casualty unless this is essential because of danger. If essential, avoid bending (flexing) the spine; drag by feet or under the armpits.
- Unless circumstances make it necessary, leave lifting, loading and transportation to a qualified person, such as an ambulance officer. It is preferable that the casualty be transferred on to a stretcher using a lifting frame (see *A.F.A.*, Vol. 2, Ch. 27, pp. 90-91).
- Support the head and neck by hand until other support can be arranged; this is especially important if the patient is found in a sitting position when trapped in a motor car.
- Apply a cervical collar if available; otherwise use a folded towel, newspaper or a bulky dressing around the neck.

If a previously conscious casualty becomes unconscious, the main problem is the airway and the victim must be placed in the stable side position. It is advisable, where possible, to apply an improvised collar prior to rolling.

When a diving accident has occurred:

- Support the head and neck.
- Use a flotation or surfboard if handy to support the casualty prior to removing from water.
- Leave the casualty on the board until a doctor or other qualified person has examined him/her and decided what to do.
- An aqua-stretcher fitted to a Jordon Lifting Frame is useful; however, this stretcher is not available in all States.

A damaged cord may sustain further injury through improper handling. A partially severed cord may be completely cut. An undamaged cord may be injured. Consider every head injury as having a neck injury until proven otherwise.

**Life threatening injuries always take precedence over possible spinal injuries.**

The usual signs of shock may be obscured in the presence of a spinal cord injury. Always suspect and look for other injuries.

Prolonged or detailed evaluation of a cord injury is inappropriate outside hospital, and is certainly not a first aid measure.

A rigid frame with plastic gliders, the Jordon frame can be used to lift an injured person with little or no disturbance or movement of the injuries. This type of device is particularly useful for a casualty with suspected spinal injury or other major injury if the frame can be placed around an accessible casualty.

The Jordon frame is placed around the casualty. There are a number of prongs along the length of the frame and holes in each end of each glider. The plastic gliders are slid underneath the casualty. This is done without altering the casualty's original position. Each end of each glider snaps onto the prongs of the frame. The position and tension of each slat can be adjusted individually against the casualty's body. The frame can then be lifted so that a stretcher can be placed beneath it or it can be lifted and carried a very short distance to an awaiting prepared stretcher.

It must be stressed that lifting frames are not stretchers and do not replace them. The design of the frame allows hand position to be comfortable during lifting but not for carrying. The slats can dislodge and the surface is slippery.

If no stretcher is available, the casualty must be secured to the frame as in a normal stretcher to prevent the limbs moving or the patient slipping off.

An inflatable mattress device called an Aqua-Stretcher can be attached to the Jordon frame. It is fitted to the frame, inflated and passed under the casualty in the water. Once the casualty is on the Aqua-Stretcher, a harness is then passed over the casualty allowing the victim to be safely lifted to a boat, floated to shore or air lifted.

## 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 minimising 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 all circumstances, care should be taken to strap the casualty to the stretcher. A special velcro strap pillow should be used for immobilising the head and neck.

### **Warning:**

- avoid pressure on localised 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. Scoop stretchers should only be used to transport casualties a very short distance.

## **Prepare and Apply an Improvised Cervical Collar to a Patient**

### **1. Making an improvised cervical collar**

The function of a cervical collar is to help support and minimise movement of the neck of a casualty with suspected cervical injury and to avoid further injury which may damage the spinal cord and result in paralysis. A cervical collar should always be used whenever there is the slightest possibility of injury to the cervical spine. It reminds the first aider of a possible spinal cord injury but still means the head and neck must be held and stabilised when moving the casualty.

### **2. Preparing a collar**

- Use something firm for the core of the collar, e.g. folded newspaper or cardboard.
- Wrap the core material in something absorbent and/or soft, e.g. towel.
- Ensure that collar is the correct size before beginning application in order to prevent excessive flexion or extension of the neck:
  - . the correct width from under the chin and jaw to the sternal notch with head in a neutral position, i.e. neither extended nor flexed;
  - . the correct length to encircle neck.

If you do not have anything from which to make the core, it is best to fold firmly an article of clothing or linen to the correct size and apply. Alternatively, place a sand bag, brick or rock each side of the head to prevent movement.

### **4.1 Prepare and Apply an Improvised Cervical Collar to a Casualty**

Checklist	Tick
Check A.B.C. Prepare cervical collar. <b>Important:</b> <b>Without a firm core there is added possibility of pressure on the trachea.</b> Inform casualty of procedure. Remove obstructing neckware (ties, jewellery). Support the head and neck from behind if possible (using a second person when available). Mould collar firmly around neck. Tie collar into place with string, bandage etc. Check there is no pressure on the airway and that it is providing firm support. Check collar is firm enough to provide support and stability. Ask the casualty if comfortable (to ensure effectiveness and adequate support, some discomfort is inevitable). Re-check A.B.C.	

Practical skill mastered

Signed .....

Date .....

# Lesson Outline for Spinal Injuries

---

## ***Introduction***

- The Vertebral Column      - Basic anatomy.
- The Spinal Cord           - Basic normal physiology.
- Vertebral Injury           - A brief discussion.
- Spinal Cord Injury       - Brief explanation of pathophysiology.
  
- Definitions               - Quadriplegia.
- Paraplegia.
  
- Causes of Spinal Cord Injury - Motor vehicle and motor cycle accidents.
- Diving into shallow water and hitting submerged objects.
- Falls onto head, buttock or feet.
- Direct injury to spine by knife wounds, gunshot or bullet.
- Explosion in confined space.
- Falls from a height greater than 6 metres (20 feet).
- Sporting accidents where the victim has been a projectile.

## ***Assessment of the injured victim***

History - Symptoms and signs.

- (a) The Conscious Victim.
  - Vertebral Injury.
  - Cord Injury      . Motor;
  - . Sensory;
  - . Autonomic effects.
- (b) The Unconscious Victim.

## ***Management of spinal cord injury***

- (a) The conscious victim.
- (b) The unconscious victim.
- (c) The victim that becomes unconscious.

## ***Lifting frames***

### ***Skills maintenance***

- (a) Using lifting frames.
- (b) Creating an improvised collar.
- (c) Semi-rigid collar.
- (d) Application of cervical collar used by State Ambulance Service or approved by the District Surgeon e.g. Stifneck, Vertebrace or Ferno Washington Collar.

***Skills Mastered***

	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# *Medical Emergencies: Diabetes and Epilepsy*

## *Diabetic Emergencies*

- 
- OBJECTIVES:** On completion of the period of training, the St John member will be able to:
- 5.1 State the difference between hypoglycaemia and hyperglycaemia.
  - 5.2 Complete the Practical Incident.
- 

### **Diabetes**

---

Diabetes is a lifelong disease, which can be controlled but not cured.

Diabetes prevents the body from processing sugar properly. Normally, sugar from all foods enters the bloodstream. Insulin helps the sugar pass from the blood into the cells of every part of the body. The sugar, in the form of glucose, is used for energy. Insulin is produced in the pancreas. But if the pancreas is diseased or not working properly, it will not make enough insulin. The sugar then builds up in the bloodstream, causing the symptoms of diabetes.

There are two types of diabetes:

1. **Insulin Dependent Diabetes:** This is the more severe form, usually arising before the age of 25. These people require insulin injections several times a day, very careful diet and regular testing of their blood sugar levels.
2. **Non-insulin Dependent Diabetes:** This arises in older people, and usually can be controlled by diet and tablets alone.

### ***Hyperglycaemia***

Hyperglycaemia means high blood sugar. This comes on slowly, over several hours or days. It can occur as the first sign of diabetes in someone who does not know he/she is diabetic, or in a diabetic who has not taken his/her medication, is eating too much or is ill.

The symptoms are:

- thirst;
- nausea and vomiting;
- frequent urination.

The signs are:

- hot, dry skin;
- fast pulse;
- drowsiness, confusion;
- possible sweet acetone smell on the breath.

Diabetics with hyperglycaemia must be taken to hospital as soon as possible. Beware of the confused, agitated casualty with a dry, hot skin, demanding fluids to drink and with a frequent desire to pass urine. He/she may have diabetes.

## ***Hypoglycaemia***

Hypoglycaemia - also called a 'hypo' - means low blood sugar. It occurs in known diabetics, over a matter of minutes, and can be fatal. It is a real emergency.

### **1. Situations where hypoglycaemia may occur.**

Hypoglycaemia may occur when a diabetic:

- has not eaten enough, e.g. missed a meal - inadequate glucose intake;
- has exercised much more than usual - burned up his/her glucose;
- has been vomiting or had a fever - vomited his/her glucose intake; fever has burned up glucose;
- has injected too much insulin - by accident or on purpose.

### **2. Symptoms and signs of hypoglycaemia.**

These may arise very rapidly, with only a few minutes between the first symptom and unconsciousness.

Symptoms include:

- weakness, faintness;
- dizziness;
- nausea.

Signs may include:

- pale, cold and clammy skin;
- rapid pulse;
- confusion and drowsiness;
- aggression;
- unconsciousness.

The unwell diabetic person may appear to be drunk rather than ill. He/she may stagger and become unco-ordinated.

### **3. Treatment**

**You cannot treat hypoglycaemia if you do not think of it.**

Diabetics often wear identifying bracelets, e.g. Medic Alert, and carry their insulin with them.

If the casualty is **unconscious**, perform a D.R.A.B.C. check and seek urgent aid medical aid.

If the casualty is **conscious**, i.e. responsive to command, give something sweet - soft drink, orange juice with extra sugar, a lolly or honey. The casualty should respond very quickly, but will need **extra sugar** soon.

After five minutes give the casualty something to eat, such as a sweet biscuit or a piece of bread. After fifteen minutes, give another sweet drink.

If you are unsure whether the casualty is having problems with high blood sugar or low blood sugar, **give sugar anyway**. Giving a bit of sugar to someone who is already hyperglycaemic will not make too much difference. Giving sugar to someone who may be hypoglycaemic could be lifesaving.

#### **4. Follow Up**

A diabetic who has had a 'hypo' will need follow up in hospital or with his/her own doctor to determine the cause. A diabetic who has had a 'hypo' must not leave the first aid room unaccompanied, unless he/she has been given an 'all clear' by a doctor.

A diabetic who does not improve rapidly after being given sugar, or who relapses, should receive urgent hospital attention. A diabetic who has hyperglycaemia should be in hospital.

#### **5. Injuries in Diabetics**

In diabetics, wounds take longer to heal and are more likely to get infected. Any diabetic who comes to the first aid room with a wound, no matter how trivial, needs that wound cleaned and dressed with meticulous care. The casualty should be encouraged to see his/her own doctor for follow up in every case, with details carefully recorded on a Casualty Report form.

### ***Further Training Suggestions***

1. Arrange for a talk by a podiatrist about foot care for diabetics.
2. Arrange for a talk by a doctor or diabetes educator from the Diabetes Foundation about blood sugar testing, diabetes in young people and diabetes in older people.
3. Arrange for a talk by a dietician about diet, in treatment and prevention of diabetes.

## 5.1 Treatment of a Diabetic Emergency

### Practical Incident

A 16 year old boy with diabetes comes to your first aid room at a sports carnival. He says he has accidentally given himself too much insulin and he is feeling dizzy and sick.

Checklist	Tick
<p><b>Approach</b></p> <p>Ask his name.</p> <p>Sit him on a bed or on the floor/ground (NOT on a chair).</p> <p>Ask if this is how he feels when his sugar levels are too low.</p> <p>Ask exactly what time he took his insulin, and how much he took.</p>	
<p><b>Observations</b></p> <p>Observe colour and skin (pale, clammy).</p> <p>Take pulse (120/minute).</p>	
<p><b>Treatment</b></p> <p>Give drink/sugar/honey.</p> <p>Assist him to drink/eat.</p> <p>Watch for quick improvement over 2 minutes.</p> <p>Repeat sugar if no immediate improvement.</p> <p>Check pulse again (100).</p>	
<p><b>Follow Up</b></p> <p>Ask if he is feeling better. Yes.</p> <p>Stress the need for continued observation.</p> <p>Give some solid food, e.g., sandwich, biscuits.</p> <p>Arrange transport to hospital, by Ambulance, or by private car with parents.</p>	
<p><b>Records</b></p> <p>Complete Casualty Record sheet.</p>	

Practical skill mastered

Signed .....

Date .....

# *Epilepsy Emergencies*

---

---

**OBJECTIVES:** At the completion of the training period, the St John member will be able to complete the following practical incidents:

- 5.3 Emergency care of a casualty during and after a generalised epileptic seizure.
  - 5.4 Emergency care of a casualty during and after an infantile febrile convulsion.
- 
- 

## **Epilepsy**

---

Epilepsy is a condition where brain activity becomes abnormal at times, causing seizures.

Epilepsy can be hereditary. Epilepsy can be caused by brain tumour or damage due to trauma, meningitis or a stroke. A person may become epileptic for no reason, at any age.

Epilepsy is usually controlled by medication. Epileptics may have a seizure if they miss a tablet, have too much alcohol, have a fever or look at bright flashing lights.

An epileptic can have several seizures in a short time or have a very prolonged seizure. Most seizures last for under five minutes.

### ***Types of seizures*** (formerly called 'fits')

#### **1. Generalised seizures (or fits)**

- (a) Tonic-clonic seizures (usually called 'grand mal' epilepsy). The person falls unconscious to the ground, with all limbs twitching. This is followed by a period of unconsciousness, and a gradual return to full alertness. He/she may pass urine or empty the bowels during a seizure.
- (b) Absences. (Previously called 'petit mal' epilepsy). There is brief, sudden loss of alertness, lasting 10-15 seconds. The sufferer will stop what he/she is doing for a short time and then resume speaking or whatever where he/she left off. These seizures can be difficult to recognise, particularly in children.

#### **2. Partial seizures**

These cause no loss of consciousness, with twitching of only one part of the body. Sometimes the epileptic person will do bizarre things which he/she does not remember on recovery.

There are many other unusual forms of epilepsy.

## ***Further Activities***

1. Contact the Epilepsy Foundation in your state for guest lecturer/videos/information.
2. If one of your St John members is epileptic, discuss whether any restrictions should be placed on his/her activities because of the condition.

## ***5.2 Emergency Care of a Casualty during and after an Epileptic Seizure***

Checklist	Tick
<p><b>Prevent further damage during seizures</b></p> <p>Keep bystanders away from casualty.</p> <p>Do <b>not</b> attempt to restrain casualty's movements or force the mouth open.</p> <p>Remove dangerous objects from vicinity.</p> <p>Call for medical aid.</p> <p>Note duration of seizure.</p> <p>Note which parts of the body are twitching or shaking.</p>	
<p><b>Protect casualty after seizure</b></p> <p>Check and clear airway.</p> <p>Check breathing and circulation.</p> <p>Place casualty in stable side position.</p> <p>Check pulse and respiration.</p> <p>Check pupils and conscious state.</p> <p>Check body for signs of injury and treat injuries.</p> <p>Check pockets for casualty identification or neck or wrist for Medic Alert tag.</p> <p>Note duration of unconsciousness.</p>	
<p><b>When casualty has recovered</b></p> <p>Keep casualty comfortable.</p> <p>Continue observations.</p> <p>Take a history of previous seizures, epileptic medication and what started this seizure.</p> <p><b>Note:</b> Epileptics may have a seizure if they miss a tablet, have too much alcohol, have a fever, or become upset. An epileptic can have several seizures in a short time.</p> <p>Encourage the casualty to go on to further medical aid.</p>	
<p><b>Records</b></p> <p>Complete a Casualty Report form.</p> <p>Write down all observations including time when taken.</p>	

Practical skill mastered

Signed .....

Date .....

### 5.3 Emergency Care of a Casualty after an Infant Febrile Convulsion

**Note:** A seizure is called an infant febrile convulsion if it occurs in a child aged between 6 months to 6 years and who has a **fever**. Teething never causes a febrile convulsion.

Checklist	Tick
<p><b>While the child is having a seizure</b>            Keep the child away from hard objects and furniture.            Note duration of seizure.            Note which parts of the body are twitching.            Do not attempt to force the mouth open.            If the seizure continues and the child becomes blue, administer oxygen if available and first aider is qualified to use oxygen.</p>	
<p><b>Assessment after the seizure</b>            Check and clear airway.            Check breathing and circulation; perform C.P.R. and/or E.A.R. if necessary.            Assess conscious state and pupils.            Note duration of any unconsciousness after seizure stops.</p>	
<p><b>Keep child cool</b>            Remove all clothing.            Fan the child, by hand or with an electric fan, until the body temperature cools (to touch or via thermometer). Take temperature via the axilla.  <b>Note:</b> Giving the child a cool bath or a sponge is no longer thought necessary.            Administer paracetamol.</p>	
<p><b>Seek medical aid</b>            Complete a Casualty Report form.            Write down all observations and hand them over to medical attendants.  <b>Note:</b> Medical aid is essential:            - in case of further seizures;            - to find out the cause of the fever;            - to rule out meningitis (bacterial inflammation over the brain).</p>	

Practical skill mastered

Signed .....

Date .....

***Skills Mastered***

	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# *Infection and Communicable Diseases*

---

**PRESCRIBED:** *Family Care at Home*, Pamphlets 9, 10 and 13.  
**REFERENCES:** *Australian First Aid*, Vol. 1, 1989.  
Supplementary Training Notes.

**OBJECTIVE:** 6.1 Having studied the appropriate texts and discussed the topic with nurses and others, the St John member will be competent to answer questions at the end of the module.

---

## **Supplementary Training Notes**

---

### ***Definitions:***

**Microorganisms**, also known as microbes and germs, or to the layperson as 'bugs', are forms of animal or plant life too small to be seen with the naked eye.

**Normal flora** are microbes which live in the body or on the surface of the body without causing disease. They perform a number of useful functions if they remain in their usual environment, e.g. on the skin, in the nose, throat and mouth, in the gastro-intestinal tract and in the vagina.

**Pathogenic microorganisms** are those capable of causing disease. They could be normal flora which have been introduced into an area which they do not normally inhabit, or they could be organisms which are new to the body, e.g. the normal flora on a carer's skin can cause infection if transferred to a person's wound.

### ***Types of microorganisms and treatments***

1. **Bacteria** grow best at body temperature (37°C) but they can multiply in a wide range of temperatures from 10°C - 60°C. Very low temperatures (e.g. refrigerators) inhibit the growth of most bacteria and temperatures above 60°C can kill bacteria. Food and water are required by all bacteria for growth and a supply of energy. Some require oxygen (e.g. microbes

multiplying in an open wound); some flourish only when oxygen is absent (e.g. deep in a wound of skin tissues or muscle); some can thrive with or without oxygen.

Some bacteria have the ability to develop round or oval structures called spores. These spores contain 'condensed' bacterial material which can live in unfavourable conditions without nourishment for many years and then resume normal activity when conditions again become favourable, e.g. tetanus and gas gangrene which live in dirt. Spores are highly resistant to high temperatures, sunlight, freezing and disinfectant and can usually only be killed by steam under pressure, e.g. in an autoclave steriliser. A bacterial infection can be treated by antibiotics.

2. **Viruses** are much smaller than bacteria and usually only grow within living cells, invading them and then taking over the metabolism (or functioning) of the cells to reproduce themselves. Some diseases which are caused by viruses are: the common cold, influenza, measles, mumps, rubella, chickenpox, herpes simplex, herpes zoster, rabies, hepatitis (also may be caused by bacteria), poliomyelitis, gastroenteritis (may be caused by bacteria), meningitis (may also be caused by bacteria), pneumonia (can also be caused by bacteria), croup and infectious mononucleosis (glandular fever). Viruses cannot be treated with antibiotics. There are no cures at present, but some cases may be prevented by immunisation.

3. **Fungi** (singular = fungus). These are vegetable organisms present in soil, air and water. Most species are non-pathogenic, but a few cause diseases, e.g. candida albicans (monilia) which is part of the normal flora of mouth, intestine and vagina. It can cause vaginitis, thrush and candida skin infections. Also there is a group of fungi which only attack skin, hair and nails, e.g. ringworm and tinea pedis (athlete's foot). The fungi can be controlled and killed by antifungal medications (creams, powders, pessaries [vaginal suppositories] and tablets).

4. **Parasites or protozoa** are single celled animal organisms, some of which are transmitted by insects (vectors) to humans. They require large amounts of water and they are abundant in soil and water and also in plants and animals.

Some diseases they cause are amoebic dysentery (transmitted in contaminated food and water), toxoplasmosis (transmitted by domestic animals) and trichomonas vaginitis (causes vaginitis and vaginal discharge). The protozoa can be found in body secretions, blood and plasma, lymph nodes and cerebro-spinal fluid. Once found, they can be treated with certain drugs.

**Infection** is a condition which exists when pathogenic microorganisms have invaded and multiplied in the tissues and there are signs and symptoms of damage to tissues. Infection is dependent on certain factors:

1. Pathogenic organisms in sufficient numbers to produce disease (varies with different organisms).
2. A means of entry into the tissue.
3. A susceptible host (one with lack of resistance to an organism).
4. A means of exit from the host.
5. Transmission to a new host. This is necessary to prevent the species or organism from dying out.

## ***Routes of entry***

1. Inhalation into the respiratory tract via the nose or mouth.
2. Ingestion through the mouth into the alimentary canal.
3. Inoculation (also sometimes termed 'injection') through the skin or mucous membrane, e.g. cracked skin, skin broken during injury, surgical procedures, injections, bites, stings or abraded mucous membranes in mouth, vagina, rectum or sometimes eyes.
4. Transplacental infection when organisms from the mother cross the placenta to enter the foetal circulation, e.g. a mother with syphilis or who is HIV positive.

## ***Routes of exit***

Microorganisms may leave the body by many routes depending upon the site of infection:

1. In mucus and saliva from the mouth and upper respiratory tract during talking, coughing and sneezing (take care with used cutlery and crockery, e.g. forks, cups, thermometers and used handkerchiefs and tissues).
2. In faeces excreted from the bowel (take care with cleaning toilets and bed pans).
3. In vomited material.
4. In discharges from wounds or discharges from infected organs, e.g. eye, ear, nose and vagina.
5. In blood, e.g. hepatitis and Human Immuno-Deficiency Virus (HIV) which causes AIDS.
6. In urine when there is an infection of the urinary tract (urine is normally sterile with no microorganisms).

## ***Body defences against infection***

The potential entry of microorganisms does not always result in disease, as the natural defence system of the body may destroy the invaders.

1. **The skin** forms an intact waterproof barrier against microorganisms and its sweat and sebum help kill some organisms.
2. **Mucous membranes** trap most organisms until they can be removed, e.g. by washing out with tears or saliva or by coughing and sneezing. Some organisms pass through.
3. **Ciliated mucous membranes:** Some mucous membranes, e.g. in upper respiratory tract, contain little projections called 'cilia' which sweep particles away from the lungs to be swallowed or coughed out. The cilia act like a field of waving corn working in one direction only.
4. **Body secretions** such as saliva, tears, gastric juice and bile are anti-bacterial in that they can discourage the growth of the bacteria and can kill certain bacteria.
5. **Lymphoid tissues**, e.g. nodes, found in all parts of the body, filter microorganisms from the circulation and destroy them. Groups of lymph nodes are found particularly in the neck, axilla and groin. Other lymphoid tissues include tonsils and spleen.

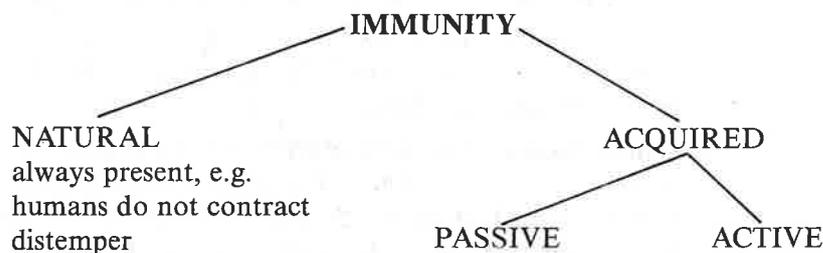
6. **Antibodies** are protein substances produced by the body mainly in the lymph nodes in response to an 'antigen'. An antigen is a substance not normally present in the body but when it enters the tissues (see section on 'Routes of entry' earlier in this module), it will stimulate the production of antibodies which are specific, and will only attack the antigen responsible for their formation.

The invasion of tissues by microorganisms causes an inflammatory response by the body. The signs and symptoms of inflammation in the inflamed area are:

- redness;
- swelling;
- heat;
- pain or tenderness;
- loss of function.

The flora, which normally live on and in the human body without causing disease, protect the body by suppressing invasions of pathogenic microorganisms.

**Immunity** is the ability of the body to resist an infectious disease. It is due to the presence of specific antibodies; therefore, immunity to one disease does not influence one's resistance to another.



### ***Types of acquired immunity***

1. **Passive:** no 'work' by individual's tissues; antibodies given to individual:
  - before birth via bloodstream of umbilicus;
  - after birth via breast feeding;
  - via injection of serum with antibodies or antitoxins, e.g. gamma globulin for hepatitis or anti-tetanus serum for a person not immunised by tetanus toxoid.

The antibodies of passive immunity only last for a short time.

2. **Active:** achieved by active production of the antibodies of the body:
  - an attack of an infectious disease;
  - repeated exposure to infection, which although not powerful enough to produce evidence of disease will still stimulate the production of antibodies;
  - **immunisation** which is vaccination or the injection of a toxoid:
    - vaccinations** are fluids containing either live, dead or weakened organisms introduced into the body to stimulate the production of specific antibodies, e.g. B.C.G. for tuberculosis, Sabin for poliomyelitis;

**toxoids** are bacterial toxins which have been neutralised to make them safe for injection into the body, e.g. tetanus toxoid, diphtheria toxoid and triple antigen (containing tetanus toxoid, diphtheria toxoid and whooping cough [pertussis] organism).

### ***Individual immunity***

1. **Environment:** People who live in overcrowded, unhygienic conditions are more exposed to more concentrated infection than those who live in spacious surroundings.
2. **Nutrition:** A good standard of nutrition is important in maintaining the body's defence system. For example, skin and mucous membranes are mechanical barriers to microorganisms only as long as they are intact and to remain intact they must receive adequate nutrients.
3. **Smoking** damages the lining of the respiratory tract and increases susceptibility to respiratory tract infections.
4. **Fatigue:** Excessive fatigue can make a person more susceptible to infection especially as nutritional standards often decline in time of overwork.
5. **Age:** Very young babies (up to 6 months of age) have a low tolerance to infections once acquired. They are particularly susceptible to respiratory infections, because the antibodies to these infections are not transferred across the placenta from mother to baby, unlike some other types of antibodies. Babies' immunity is improved by the age of 18 months.  
Elderly people have a lowered level of resistance to infection due to general deterioration of body tissue, and also have difficulty in fighting infections, once acquired.
6. **General health:** Anything which is detrimental to the health of body tissues will adversely affect their ability to resist infections. Long term conditions such as cancer, diabetes mellitus, certain blood disorders and alcoholism lower the individual's resistance to infection.

### ***Prevention of spread of infection***

1. **Infected carer or worker:** Assess the degree of infectivity. If the carer has an infected finger, he/she may be able to work wearing a glove. If he/she has a respiratory infection and is to remain on duty, a mask should be worn.
2. **Infected patient:** It may be necessary to isolate a particular area of a patient, e.g. a dressing covering an infected wound, or to take care of disposal of all body secretions. It may even be necessary to isolate the whole person including the bed, all bed linen, all articles handled by the patient, all equipment used by the staff in attending to the patient and all surfaces (walls, floor, furniture). The degree of isolation required depends on the type of infection and will be determined by the medical practitioner and registered nurse.
3. **The environment**  
**Room hygiene:** Ensure dispersal of dust into the atmosphere is minimal, e.g. use of vacuum cleaners with filters, minimal flicking of bed linen, damp dusting (using damp cloth to wipe over surfaces) washable furniture and removal of items which might attract flies and ants. Also, do not leave damp areas as microorganisms can grow in these, e.g. suction bottles with secretions inside or a bottle of milk left out of the refrigerator.

All equipment used by more than one person should be regarded as capable of causing cross infection (the carrying of infection from one place to another) and precautions taken as necessary. These items include mattresses, pillows, bed furniture, commodes, walking frames, telephones and toys.

**Foodstuffs** are ideal mediums for growth and reproduction of microorganisms. Materials which can form a protective shell over microorganisms are grease, dirt, pus, blood, mucus, food particles, tissue segments, adhesive materials, e.g. adhesive tapes. Proteins coagulate in higher temperatures, e.g. in milk and blood. Therefore:

- Cleaning ensures the physical removal of dust, dirt and any contaminants and moisture from a surface to prevent microbes from having the nutrients available to be able to grow in and under.
- Clean off blood with cool water rather than hot to ensure thorough removal.
- Receptacles containing certain foods, including milk and milk products, chicken and sea foods, should be kept covered and refrigerated. Foods kept warm for long periods of time provide ideal mediums for microorganism growth.
- Once physical removal of food, e.g. egg, is complete, crockery and cutlery should be washed in soapy water with a detergent and allowed to dry by draining upside down.
- Tea towels used should be laundered after each occasion, and not used as hand towels also.

### ***Other preventive actions***

Hands are big spreaders of infection, being able to contaminate everything which they contact. Handwashing begins to be effective after 30 seconds and is best done under running water. Rub your hands all over each other, using soap, under the running water to ensure physical removal of organisms.

Keep rubbing, washing off the soap. Dry with a dry cloth towel or paper towel. Change hand towels every day. Wash hands after going to the toilet (and before if you have contacted someone who has an infection, e.g. skin infections such as boils which you catch by cross infection) and before dealing with food, crockery or cutlery. Also wash your hands after blowing your nose or sneezing or coughing, if your hands cover your mouth and if you are dealing with food or about to do another clean procedure.

Avoid touching any infected wound or potentially infected material, e.g. dressing or tissues, with bare hands. Treat any blood or blood-stained item as infectious and dispose of it properly and promptly; (See *A.F.A.*, Vol. 1, pp. 225-226.

Wear gloves when treating all wounds.

There are times when a known risk of infection exists. In such cases, medication can be taken prior to infection to actually prevent the infection occurring, e.g. malaria.

### ***Other definitions***

**Carriers:** These are people who are immune to a particular infection but carry the bacteria in their bodies and transmit them to others who are not immune, e.g. diphtheria carriers harbour bacteria in their throats and hepatitis carriers harbour infective hepatitis in their blood and secretions such as saliva.

**Droplet Infection:** Infection carried in moisture, e.g. organisms from the nose and mouth, may be expelled through talking, coughing and sneezing.

## Some Specific Infections:

---

### **1. Tetanus**

Tetanus is caused by a bacterium which lives in soil and dirt. Any wound contaminated by dirt, earth or manure - wounds from rusty nails, barbed wire, garden tools, gravel or road dirt - is a 'tetanus-prone wound'. All patients with a tetanus-prone wound - no matter how small - should seek medical advice, even if they have had a recent tetanus toxoid injection.

**All open fractures, burns and penetrating wounds** are considered to be tetanus-prone wounds.

### **2. Hepatitis A (Infectious Hepatitis)**

### **3. Hepatitis B (Serum Hepatitis)**

Hepatitis is a viral liver infection spread by direct contact with the blood, saliva or excreta of an infected person. It can be passed on by unprotected sexual intercourse. Some people are Hepatitis B carriers; the virus is in their blood, and causes them no ill effects, but can still spread to others.

Hepatitis B is very common among some groups of people:

- Aboriginal people;
- Intravenous drug users;
- South East Asian immigrants;
- Homosexual men with a number of partners.

The **symptoms and signs** of Hepatitis B are similar to those of Hepatitis A, but much more severe. The disease can be fatal.

#### **Treatment:**

There is no actual cure for Hepatitis. Rest and nursing care under medical supervision are essential until the symptoms disappear. The patient should preferably be kept in a single room and should not be allowed to handle food other people will be consuming.

#### **Prevention:**

- (a) Prior to a duty, examine your hands and cover cracks in skin or wounds with adhesive dressings. Get as little blood on your hands as possible. Unless there is life-threatening bleeding, **do not** put your hand directly on a wound but wear disposable examination gloves. Wash any blood off your hands as soon as you leave the casualty. Dispose of all blood-stained material properly.
- (b) Immunisation is available for people especially liable to come in close contact with the blood or body fluids of Hepatitis B sufferers - dentists, nursing staff, doctors, first aiders and laboratory technicians.
- (c) There is an injection available which may prevent Hepatitis B from developing; the injection must be given within 5 days of contact with Hepatitis B.

If you are in any doubt, see your own doctor.

#### **4. AIDS - *Acquired Immune Deficiency Syndrome***

AIDS is caused by the Human Immuno-Deficiency Virus (HIV). This virus changes the genetic structure of the cell it attacks, making the cell incapable of functioning normally. Once the virus has entered the bloodstream the body begins to produce AIDS-specific antibodies which can be detected in the blood after 2-3 weeks.

AIDS has been reported among several groups of people:

- (a) Homosexual/bisexual men;
- (b) Intravenous drug users;
- (c) Prostitutes;
- (d) Blood transfusion recipients (since 1985 all blood donations have been screened for the AIDS virus);
- (e) Haemophiliacs;
- (f) Heterosexual contacts of the above groups.

##### **Transmission**

- (a) Sexual activity involving exchange of body fluids;
- (b) Sharing contaminated needles;
- (c) Transfusion of infected blood or blood products;
- (d) Accidental needle stick injuries and where the contaminated fluid comes into contact with broken skin of the handler.

AIDS is **not transmitted** through:

- (a) Sweat;
- (b) Casual contact, e.g. shaking hands;
- (c) Air;
- (d) Insect bites.

The AIDS virus has been found in saliva but the disease has not been proven to have been spread by contact with contaminated saliva to date. Nevertheless, as there is a theoretical risk, the St John member should take the same precautions with saliva that are taken with blood.

##### **Prevention**

The same precautions need to be taken for AIDS as for Hepatitis B.

If a St John member suspects that contact has been made with the AIDS virus, the member should have blood taken as soon after the event as possible, then again 2-3 weeks and 6 months later to determine whether AIDS antibodies are being produced. If after 6 months there are no antibodies in the blood, then the disease has not been contracted.

Most cases of health workers being infected with the AIDS virus have been due to inadequate precautions being taken with a known AIDS patient. It is, therefore, necessary to use the same precautions for all patients so that they become familiar and contamination is less likely to happen.

**Prevention is always better than cure.  
Treat all blood as infectious.**

## A SUMMARY OF SOME SELECTED COMMUNICABLE DISEASES

TABLE 1

INCUBATION PERIOD	DISEASE	SYMPTOMS	DURATION OF INFECTION	TREATMENT	COMPLICATIONS
SHORT PERIOD	Influenza	Fever Sore throat and dry cough, husky voice Tiredness Loss of interest	Variable with each epidemic	Rest in bed. Copious fluids. Light diet. Limit talking	Pneumonia
	Diphtheria	Fever. Localised throat infection. White patch on side(s) of throat. Swollen nodes (glands). Difficulty in swallowing. Vomiting	Four weeks approximately	Rest in bed Anti-toxin	Toxic effect on heart muscles and nerves
	Infectious Diarrhoea	Abdominal pain Frequent loose bowel actions Vomiting	Variable, depending on seriousness of condition	Boiled water with a pinch of salt or gastrolyte liquid available from chemists. Semi-solid food - no solid food for twenty four hours	
	Scarlet Fever	Sudden symptoms of fever, chilliness, headache A sore, reddened throat and tongue Nausea and vomiting	Approximately ten days in uncomplicated cases	Rest in bed. Antibiotics. Pain reliever. Semi-solid food until throat improves	Otitis media (infection of middle ear) Kidney infection around third week
	Measles (1)	Severe cold with a harsh cough Sore 'watery' eyes Rash inside mouth, on face and then rest of body (red and patchy)	Approximately four weeks	Rest in bed while fever lasts Shaded light in room Copious liquids	Bronchitis pneumonia conjunctivitis Ear and sinus infection Small bowel infection Inflamed brain tissue
	Whooping Cough	Infection in upper breathing passages Has the appearance of a severe cold, coughing in bursts. Blue tinge of skin - vomiting may occur	Four to six weeks from beginning of whoop	Rest in bed while feverish Avoid dust, smoke and excitement Fluids and bland foods	Bronchopneumonia Lung collapse
	Poliomyelitis	Headache, fever, general tiredness, stiffness of neck and back	Usually up to six weeks, but variable	Rest in bed in isolation. Observe for throat infections Avoid fatigue and discharges from throat and bowel Physiotherapy — later	Respiratory infections Muscular weakness
	Gonorrhoea (earlier in men) (longer in females)	Burning pain on passing urine Discharge from urethra, mucus at first, later pus	Several weeks	Penicillin injections	Inflammation of urethra and reproductive organs
	Measles (2) Rubella (German measles)	Small (pinhead) size rash over the body enlarged and tender nodes (glands) at back of head and neck — fatigue	One week before and up to four days after rash disappears	If feverish, rest in bed Plenty of fluids	Rare, unless in the case of a pregnant woman when the developing infant can be affected
	Chickenpox	A small red and itchy rash on body, face and the body limbs, which turn to yellow blisters and then break Headache, cough	Until after rash has dried, formed scales and dropped off	Bed rest Calamine lotion to relieve itch Cotton mittens to limit scratching in children	Pneumonitis after severe attacks— cough, difficulty in breathing after a severe condition
Mumps	Fever, a sudden onset with swelling of salivary glands in front of and below the ear on one or both sides	Seven days after swelling subsides	Nurse in room alone should doctor order this Hand washing essential after handling any article of the patient as infection is by direct contact and droplet infection	Rare, occasional inflammation of reproductive organs	
LONG PERIOD (over 3 weeks)	Infectious (Virus A) Hepatitis	Jaundice of skin and whites of eyes Dark, tea coloured urine - pale faeces Fever, lack of appetite Nausea, tiredness	Variable, depending on severity of condition	One hour rest after each meal, otherwise strict bed rest is not essential. Diagnosis may require a short stay in hospital. Restricted physical activity. A high calorie balanced diet. A good standard of personal hygiene	Chance of recurrence at a later date
	Serum (Virus B) Hepatitis	As above, but is often acute at start Upper abdominal discomfort, loss of appetite Nausea and vomiting	May recur after weeks or months	Similar to above	Serious liver damage
	Syphilis	Ulceration at site of transfer of condition e.g. vulva, penis, lips, tongue, hands, rectum, nipples	May be months or years	Special treatment in clinics for this purpose	Many other organs of the body can be affected in a serious manner, e.g. heart and blood vessels

NOTE: INCUBATION PERIOD — The time between coming in contact with the disease and symptoms appearing.

TABLE 2 RECOMMENDED IMMUNISATION SCHEDULE

AGE	DISEASE	AGENT	ROUTE
2 months	Diphtheria, Tetanus, Whooping cough (Pertussis)	D.T.P. Vaccine (also called Triple Antigen)	Injection
	Poliomyelitis	Sabin Vaccine	Oral drops
4 months	Diphtheria, Tetanus, Whooping cough (Pertussis)	D.T.P. Vaccine (also called Triple Antigen)	Injection
	Poliomyelitis	Sabin Vaccine	Oral drops
6 months	Diphtheria, Tetanus, Whooping cough (Pertussis)	D.T.P. Vaccine (also called Triple Antigen)	Injection
	Poliomyelitis	Sabin Vaccine	Oral drops
12-15 months	Mumps, Measles and Rubella	M.M.R. Vaccine	Injection
18 months	Diphtheria, Tetanus Whooping cough (Pertussis)	D.T.P. Booster	Injection
5 years or prior to school entry	Diphtheria, Tetanus	C.D.T. (Childhood diphtheria tetanus vaccine)	Injection
	Poliomyelitis	Sabin Vaccine	Drops
10-14 years (Females)	Rubella (German measles)	Rubella Vaccine	Injection
15-19 years or on leaving school	Diphtheria and Tetanus	A.D.T. (Adult diphtheria and tetanus vaccine)	Injection
	Poliomyelitis	Sabin Vaccine	Drops

## Questions:

---

1. How are infectious diseases spread?
2. How can you prevent the spread of infection?
3. What precautions are necessary when you are nursing an infectious person at home?
4. A person comes into the first aid room with a large laceration to the forearm. The wound is bleeding freely. What will you do?

After you have begun treatment the casualty tells you that he has Serum Hepatitis. What, if anything, will you need to do?

5. A mother comes into your first aid post with her young child who has cut his foot on a piece of broken glass. The child is two years old. After you have treated the child, the mother asks you if the child requires a tetanus injection. What will you need to ask the mother and what would you suggest she do?
6. Describe how you could clean a baby's bottle (including teat) **prior** to its sterilisation. With each step of cleaning, explain why you doing that step.
7. Why should crockery and cutlery be checked when taken out of a dishwasher?
8. What should be done with bed linen which is blood contaminated?

### *Skills Mastered*

	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# *Exposure to Temperature Changes*

---

**PRESCRIBED REFERENCE:** *Australian First Aid*, Vol. 1, 1989.

**OBJECTIVE:** 7.1 On completion of the training period and after studying the material listed below the member will be able to complete the questionnaire following.

---

## **Heat Emergencies**

---

### ***Heat Exposure***

The body maintains a central core temperature of 37°C. To maintain this constant temperature, the body has a complex regulating device controlled from the hypothalamus in the brain. This regulating device includes heat loss from the expired breath, urine, faeces and skin. The skin is the most effective of the heat regulating organs and loses heat quickly due to evaporation, conduction, convection and radiation. However, if any part of this system fails, is overcome or damaged then the casualty will suffer from heat exposure.

Heat exposure is a continuing process extending through the three stages:

- heat cramps;
- heat exhaustion;
- heat stroke.

#### **1. Heat Cramps**

Heat cramps are characterised by severe muscle pains and cramps, especially in the legs and the abdomen. Because heat cramps may lead to heat exhaustion, the casualty may complain of faintness, nausea or vomiting, dizziness and marked weakness. The skin is cool and moist.

#### **Treatment**

- (a) Remove casualty to a cool place and have him/her lie down.

- (b) Replace salt by giving casualty drinks containing a mixture of small amounts of glucose, salt and water at a ratio of one half teaspoon of salt to 1000 mls of water or products such as Staminade. No salt tablets should be given as they do not dissolve. Also check whether casualty is a diabetic before giving glucose.
- (c) Apply ice packs to cramped muscles for 15-20 minutes.
- (d) Gently stretch the cramped muscles.

## 2. Heat Exhaustion

The casualty may complain of generalised weakness and fatigue and may even faint. Helpful in identifying heat exhaustion is the pale, clammy skin of the casualty. The skin temperature may feel normal or cool. The casualty may be nauseated and may even vomit. The pulse is weak and rapid. Blood pressure is usually decreased, breathing is rapid and pupils may be dilated. The casualty if conscious may also exhibit signs and symptoms of heat cramps.

### Treatment

- (a) Move casualty to a cooler environment.
- (b) Loosen clothing and if possible sponge casualty with cold water.
- (c) If the casualty is conscious, give water with small amounts of glucose and salt (one half teaspoon salt to 1000 mls water). If no salt, give water and plenty of it to drink.
- (d) Treat any muscle cramp.
- (e) If fainting has occurred, place casualty flat with feet raised or if still unconscious turn into the stable side position.

**A casualty suffering heat exhaustion has a definite pallor which is in marked contrast to the reddish blush and dry skin of the heat stroke victim.**

## 3. Heat Stroke

In contrast to heat exhaustion, heat stroke is an emergency of greater magnitude. Heat stroke, like heat exhaustion, indicates poor acclimatisation to excessive heat, usually associated with high humidity. The casualty's body is unable to cope with the excessive heat and the heat regulation mechanism fails as sweating stops. It must be noted that heat stroke has a 25-50% mortality rate.

The cardinal signs of heat stroke are:

- history of exposure to high temperatures;
- a hot, flushed dry skin;
- strong, bounding, rapid pulse;
- agitation, coma and seizures.

These cardinal signs may be preceded by signs and symptoms of heat cramp and heat exhaustion. Occasionally a casualty may continue to sweat freely.

A patient with a temperature over 40°C needs urgent medical aid. If the casualty's temperature reaches 41°C due to heat illness, the casualty can have irreversible damage to kidneys and other organs and may die.

### Treatment:

- Remove to cooler place.
- Remove all clothing.
- Douse with cool water and cover with wet sheet.

- Circulate air over casualty by fanning.
- Administer oxygen if possible.
- If conscious, give frequent sips of water or ice in the mouth as fluid decreases morbidity and mortality.

**All casualties who suffer heat exposure must be hospitalised as a matter of urgency.**

## **Cold Emergencies**

---

### ***Exposure to Cold***

Cold by itself is not usually a problem unless it is extreme or the subject is scantily clad, ill, injured, undernourished, exhausted, elderly or on some anti-depressive drugs.

If there is exposure to cold and wind, the wind drives cold air through clothing and over exposed surfaces. Heat loss increases markedly. Remember, the faster the wind, the cooler the casualty will become; therefore get the casualty out of the wind.

The effects of these conditions on a person depend on his/her physical state, clothing, food intake and mental state.

### ***Cold, Wind and Water***

Water makes intimate contact with skin and is a powerful conductor of heat. Misty rain removes heat as it evaporates from the body surface. Heavier rain removes heat as it flows over the body surface. Water also ruins the insulatory value of clothing. Cotton when wet loses 90% of its insulating value, wool 50%.

The combination of cold, wind and rain is a potentially fatal mixture for the ill, infirm, elderly, injured or unwary.

### ***Signs and Symptoms of Hypothermia***

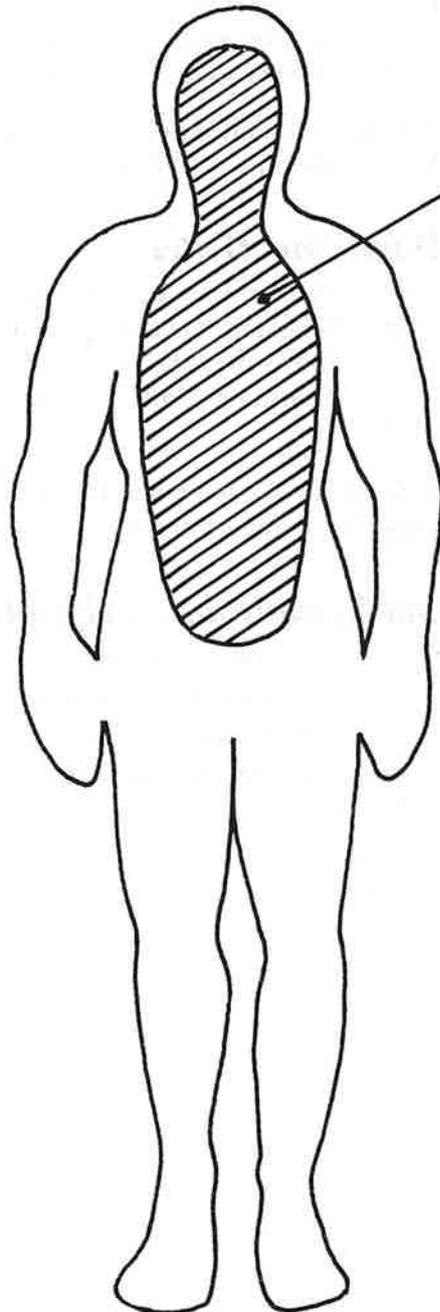
It is not always easy to recognise the onset of hypothermia. Watch out for:

- unexpected and unreasonable behaviour, often accompanied by complaints of coldness and tiredness;
- physical and mental lethargy, including slowness to respond to or understand questions;
- visual disturbances are common;
- slurred speech;
- sudden shivering fits;
- abdominal cramps;
- violent outbursts of unexpected energy, possible physical resistance to help, foul violent language;
- falling;
- collapse and coma;
- slow pulse;
- slow, weak respirations;
- skin cold to touch.

## ***Progressive Clinical Presentation of Hypothermia***

C

- 37° – Normal oral temperature.
- 35° – Shivering maximum at this temperature.
- 33° – Severe hypothermia below this temperature.
- 32° – Shivering ceases.
- 30° – Progressive loss of consciousness.
- 28° – Ventricular fibrillation may develop if heart irritated.
- 25° – Ventricular fibrillation may be spontaneous.
- 24° – Pulmonary oedema develops.
- 22° – Maximum risk of ventricular fibrillation.
- 20° – Cardiac standstill.



**Fig. 1** Core Temperature

Brain  
Spinal cord  
Heart  
Lungs

### **Treatment:**

The principle is to prevent further heat loss.

- (a) **Stop where you are;** provide shelter out of weather.
- (b) Remove wet clothing and dry casualty off without excessive movement.  
Excessive movement can tip a casualty into ventricular fibrillation.
- (c) Dress in dry clothing.
- (d) Get casualty into a sleeping bag or wrap neck to toe in polythene bags.  
**Insulate above and below** casualty against wind and rain.
- (e) Optional treatment is to place casualty, after drying, into sleeping bag naked and other member of party stripped to underclothing get in with him/her.
- (f) If casualty is conscious, give hot sweet (very sweet) drinks, glucose or condensed milk.
- (g) If respiration ceases, perform E.A.R. Casualties with cardiac or respiratory arrest merit extraordinary resuscitation efforts as cooling may prevent brain damage.
- (h) Send distress signal or send for assistance. If isolated, either stay together where you are or send for help. **Leader must make decision.**
- (i) Treat casualty as a stretcher case, even if he/she seems to have recovered.
- (j) **Keep head lower than body.**
- (k) If with hiking party **assume all are likely exposure casualties;** therefore, shelter, warm food, rest.

### **Do not try to warm by:**

- giving alcohol by mouth;
- rubbing limbs and flesh;
- placing hot water bottles, heated stones or electric blankets near casualty, as these will cause severe burns due to poor diffusion of conducted heat by bloodless skin. There is also the risk of thawing limb tissue becoming gangrenous due to the blood being frozen and thus unavailable to the partially thawed limb. All the above treatment is designed to do is prevent further loss of heat. The re-heating of the hypothermic casualty takes hours under strict medical supervision.

Please remember that not just mountaineers suffer hypothermia. Casualties who drown in cold water, casualties who are in cold water for periods of time, the ill, the elderly and the poorly nourished also are very prone to cold exposure.

As St John members we must be aware of excessive cooling of burns casualties, who have lost the major heat regulating mechanism. If it occurs via their skin, it will cause hypothermia which may be more dangerous than the burn. If the casualty is shivering or 'blue' or complaining of cold, cease the cooling and cover the burn. Also remember, the casualty lying on a street on a cold, wet, windy winter's night must also be prevented from developing hypothermia.

**The best treatment for hypothermia is prevention.**

## **Frostbite**

---

Frostbite occurs when isolated parts of the body are exposed to prolonged or intense cold. The exposed part first becomes red and inflamed. The skin progressively turns grey or mottled, leading to a white and waxlike

appearance, with stiffening and hardening. As these changes occur the casualty feels firstly stinging and burning, followed by pins and needles sensation, then stiffness and loss of function.

**Treatment:**

- (a) Gently remove clothing from affected area, e.g. shoes and socks.
- (b) Remove any constrictions to limbs.
- (c) Re-warm part by covering with warm hand.
- (d) Cover damaged tissue with dry non-stick dressing.
- (e) Give casualty warm, sweet drinks.
- (f) Treat hypothermia.
- (g) **Do not allow casualty to smoke.** Nicotine causes constriction of blood vessels, further compromising blood flow to the affected part.
- (h) Anticipate the severe pain a casualty may feel as part thaws.
- (i) Send to medical aid. Do not allow casualty with frostbitten feet to walk.

**Do not rub or chafe affected areas.**

**Do not apply snow.**

**Re-heat only under medical direction.**

## **Questionnaire - Heat Emergencies**

---

1. What is the standard method of determining body temperature?
2. What is heat cramp?
3. Outline the treatment of heat cramp?
4. What is heat exhaustion?
5. Outline the treatment of heat exhaustion.
6. List the signs and symptoms of heat stroke.
7. Outline the treatment of heat stroke.
8. What is the mortality rate of heat stroke (as stated in this module)?

## **Questionnaire - Cold Emergencies**

---

9. What are the three major environmental factors in the cause of hypothermia?
10. List ten contributing factors which increase a person's chances of suffering hypothermia.
11. State how a strong wind helps in cooling a person's body.
12. Why is wet clothing so dangerous to a tired person in a cold and windy spot?
13. List the signs and symptoms of hypothermia.
14. Outline the treatment of hypothermia.
15. Why must you never place hot objects next to the skin of a hypothermic casualty?
16. What conditions make a person more susceptible to hypothermia?
17. What happens when frostbite occurs?
18. Outline the correct management for frostbite.

***Skills Mastered***

Satisfactory

Fail

Re-test

EXAMINER Please tick  
Please sign and print name

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# *Dressing Techniques*

---

**PRESCRIBED REFERENCES:** *Australian First Aid*, Vol. 1, pp. 225-227, 1989.  
*Family Care at Home*, Skill 25, 1990.  
Supplementary Training Notes.

**OBJECTIVES:** On completion of the training period and after practising the practical skills listed below, the member will be able to apply one or more of the skills to a mock practical incident:

**8.1** Preparation of sterile equipment.

**8.2** Aseptic dressing technique.

---

## **Supplementary Training Notes**

---

### ***1. Preparation of Sterile Equipment in the Home Environment***

You will require:

- 1 large saucepan with well fitting lid;
- 1 cup or bowl;
- 1 saucer or small plate;
- 4 pairs forceps (dressing);
- cotton balls or gauze swabs;
- combine dressing;
- scissors;
- 1 casserole dish with lid;
- small paper bags.

Two extra pair of forceps are included in case those in use touch an unclean surface and need to be discarded.

#### **Step 1**

Ensure all equipment to be used is cleaned thoroughly with soap and water.

Place cup, saucer and forceps in large saucepan and cover with water. Put lid on saucepan, then bring to the boil on the stove and boil for 10 minutes (by the clock). After this time, remove from the heat and drain off the water, leaving articles in the saucepan. Leave the lid firmly in place until articles are required for use.

Items can be boiled in an appropriate container for 10 minutes in a microwave oven.

### **Step 2**

Place cotton balls, gauze and combine dressing into casserole dish. These can be left loose or placed in paper bags. If using paper bags, place 3 gauze swabs, 6 cotton balls or 1 piece of combine dressing in each bag, fold over the top three times and then tape down. Place bags into the casserole dish.

Place dish and lid separately into an oven that has been preheated to 160°C (325°F) and bake for 1 hour. Turn off heat and allow oven to cool before opening door. Place lid onto casserole dish, taking care not to touch the inside of the lid, dish or the dressings.

Any dressings that have been scorched should be discarded; use a pair of forceps to remove from container.

Covered container of loose dressings may be kept for up to 24 hours; then the procedure should be repeated. Dressings done in sealed paper bags are sterile for 1 month provided the bag is not broken or wet.

### **Step 3**

Scissors should be opened and then soaked in a disinfectant solution, e.g. alcoholic (70%) chlorhexidine or safsol (teaspoon to a glass of water) for 3 minutes.

### **Step 4**

Saline can be prepared using 600 ml boiling water and 1 teaspoon salt. Into a glass container, put boiling water and salt and then cover and allow to cool. This solution must be discarded after 24 hours.

## ***2. Aseptic Dressing Technique***

Collect:

- sterile equipment as prepared above;
- clean hand towel and soap;
- ice cream or similar container lined with a plastic bag for soiled items;
- medicaments as and if ordered by doctor.

Explain procedure to the patient.

Thoroughly wash hands under running water with soap for 2 minutes. Dry with clean hand towel.

Collect equipment and place on clean table beside patient.

Remove cup, saucer and forceps from saucepan, taking care not to touch inside of cup or saucer or pointy end of forceps. Place forceps, points down, in cup. Pour required quantity of solution in cup.

Remove lid of casserole taking care not to contaminate inside of lid.

Remove required dressings with forceps from casserole and place on saucer. Replace lid on casserole. Replace forceps in cup.

Gently remove old bandage or tape and loosen dressing. ↘

Wash and dry hands as previously.

Use one pair of forceps to remove old dressing and discard into lined ice cream container. Discard forceps back into saucepan.

Clean wound using forceps to hold swab and, using each swab once only, wipe from top to bottom of wound and from inside wound to out. Discard used swabs into ice cream container. Discard forceps back into saucepan.

Apply ordered medicaments to wound.

Cover wound with new dressing. Taking care to touch only the outside of the dressing, place it over the wound then tape or bandage in place.

Discarded swabs and dressing should be disposed of by burning or placing in sealed, plastic bag in bin.

All equipment used should be cleaned thoroughly with soap and cold water ready to be sterilised for next use.

Wash hands with soap and water and dry thoroughly.

### ***Skills Mastered***

	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Signed: ..... Date ..... / ..... / 1993

Name: ..... Position: .....

Qualification: (Please tick where appropriate)

Doctor ..... Registered Nurse ..... Ambulance Officer .....

Training Branch Accredited Instructor: .....

Operations Branch Member (approved by District Surgeon): .....

# Childbirth

---

---

**PRESCRIBED REFERENCES:** N.R.C. ROBERTON: *A Manual of Neonatal Intensive Care*, 2nd edition, Edward Arnold, London, 1986.  
*Australian First Aid*, Vol. 2, Ch. 24, 1989.  
Film/Video.

**OBJECTIVE:** 9.1 To assist at a normal unexpected delivery of a baby away from medical care.

---

---

## Stores

---

- doll;
- Resusi-baby;
- childbirth stores as in *A.F.A.*;
- soft bag and mask;
- oxygen equipment and suction.

## Introduction

---

Childbirth is a natural event, and usually goes smoothly with a healthy mother and healthy baby at the conclusion. However, complications can occur and they can occur quickly and unexpectedly.

It is always better for the mother to have her baby with the assistance of medical and nursing attendants. The best way to take a baby to hospital is inside his/her mother. It is almost always safer to take the woman in labour to hospital, rather than loiter at home or elsewhere making elaborate preparations for an emergency delivery.

It is rare nowadays to be out of contact with an emergency service; ring a hospital, doctor or Ambulance Service for instructions and advice before you attempt an emergency delivery. Ring again if anything abnormal arises.

## **First Stage of Labour**

---

During the first stage of labour the cervix, or entrance to the uterus, opens up.

The first stage of a normal labour may last up to 24 hours in a woman having her first child. It may be as short as one hour for a woman who has given birth before.

**Contractions** are regular, painful tightenings of the uterus, which force the cervix open. The contractions become more frequent and stronger as labour goes on: at the height of labour they come every 2-3 minutes and last for 45-60 seconds.

During the first stage, allow the mother to walk, move or lie as she wishes. Check her pulse every 30 minutes, and temperature every 2 hours.

## **Second Stage of Labour**

---

In the second stage, the baby moves down the mother's vagina. The contractions now are strong and frequent, lasting about 60 seconds every 2-3 minutes. The mother will feel like 'pushing' or opening her bowels.

**Do not let her sit on the toilet.**

The second stage may last up to 2 hours with a first baby, allowing plenty of time for the mother to be taken to medical aid. With a second or subsequent child, the second stage may take a few minutes only.

### ***Potential dangers***

1. To mother:
  - (a) Infection (see *A.F.A.* Vol. 2, p. 50).
  - (b) Bleeding. Note the amount of blood that is lost.  
Retain blood-soaked pads and towels to be assessed by medical attendants.
2. To baby:
  - (a) Infection from the cut end of the umbilical cord.
  - (b) Cold.
  - (c) Lack of oxygen.

## **When delivery is close**

---

### ***Position mother for delivery***

- Explain each action to the mother before you do it;
- lie mother on prepared bed, in a position of comfort;
- knees are drawn up and apart;
- place a drape or sheet over the lower part of mother;
- maintain privacy.

### ***Prepare first aider for delivery***

- Put on mask or tie clean handkerchief over your mouth;
- tie apron or sheet around waist, to protect your clothing and minimise infection;
- wash hands thoroughly and dry on a clean towel;
- put on gloves;
- prepare 2 warm towels or nappies for the baby;
- warm them near a heater or have someone warm them under their jumper.

### ***Prepare mother for delivery***

- Swab the genital area thoroughly with diluted, warm antiseptic solution or cooled boiled water;
- if there are no swabs available, gently pour warm water over the mother's genital area;
- swab from top to bottom, using a clean swab for each wipe.

### ***Delivery of the Head***

When delivery is imminent, the perineum (skin between anus and vagina) will start to bulge.

- Place a pad over the anal area;
- as the head emerges, ask the mother to pant; not push, so the head is born slowly and gently;
- place one hand on the crown of the baby's head and hold it gently but firmly to prevent the head flicking out suddenly.
- **Note:** if the head is born too quickly, the mother may suffer a major laceration, and the baby may suffer brain damage (see *A.F.A.*, Vol 2, p. 52, Diagram 24.1).
- the head will emerge face down, then turn to one side;
- feel for cord; if it is around the neck, free it gently (see *A.F.A.*, Diagram 24.2).
- **Note:** If the cord is too tight and cannot be slipped over the baby's head, the first aider will have to tie the cord very securely in 2 places, 3 cm apart, and cut between the ties. This is very difficult.
- await next contraction for delivery of shoulders.

### ***Delivery of shoulders***

- Position your hands on either side of the baby's head, over the ears;
- guide the head slowly downwards as the mother pushes;
- watch for delivery of upper shoulder;
- guide head upwards for delivery of lower shoulder.

### ***Delivery of body***

- Grasp baby under armpits (he/she will be slippery and very wet);
- slowly lift baby up onto mother's abdomen;
- make a mental note of the exact time of birth.

## Care of the Baby

---

The baby will be wet and blue at birth. He/she must be kept **warm and pink** to survive.

### 1. Airway

- Place baby's head low, to drain secretions from its mouth.

### 2. Warmth

- Immediately and firmly dry the baby all over with a dry, and preferably warm, nappy or towel; this will take 15-30 seconds;
- remember to dry the baby's head and in the creases of groin and armpits;
- as soon as the baby is mostly dry, discard the wet cloth and cover the baby in a dry one;
- give the baby to the mother.

### 3. Respiration

The baby will gasp and then start breathing regularly. Its colour will then change from blue to pink. The hands and feet may remain blue for several hours. If the baby has not begun to breathe by one minute, clear the airway of mucus with your fingers or with suction. Blow once on the baby's chest; your cold breath may stimulate the first breath.

If no breathing in response to that:

- commence E.A.R. (see *A.F.A.*, Vol. 1, Diagram 4.3);
- or infant bag and mask resuscitation;
- use oxygen if this is available.

### 4. Circulation

- Check pulse at the apex of the heart; feel with 2 fingers over the left nipple;
- if heart rate is under 60, commence cardiac massage at 120 beats/minute.

The heart rate for a normal new-born is 120 beats/minute. A baby with a heart rate of 60 beats/minute is already a sick baby and will die without first aid intervention. External cardiac compression will promote recovery of the heart to its normal rate and rhythm, while E.A.R. improves the oxygen supply to the baby. Almost all babies respond very quickly to this basic resuscitation.

Once the baby is breathing and pink, wrap it firmly in the dry cloth and hand it over to mother.

## Care of the Cord

---

Once the baby is pink and breathing, it does not need the blood supply from the umbilical cord:

- place a sterile tie approximately 10 cm from the baby's navel area;
- place 2 other ties at 15 cm and 20 cm;
- **do not pull on the cord.**

The cord may need to be cut if:

- the cord is too short for the mother to hold baby properly;
- baby needs to be taken from mother's side for intensive resuscitation;
- mother needs attention and cannot hold the baby.

If warranted, cut the cord between the second and third ties, using sterile scissors. Leave 2 ties on the baby's end of the cord. As the cord is cut, blood will spurt everywhere. Place a pad over the cord to stop the spray. Then:

- cover cord stump loosely with a sterile dressing.

## **Delivery of Placenta**

---

- Mother lies on her back, with legs apart;
- wait patiently for delivery of placenta (10-30 mins);
- do not pull on cord;
- place placenta in plastic bag or icecream container;
- note time of delivery of placenta;
- placenta is always transported with mother, with details of time of the birth of the baby and delivery of the placenta.

## **Care of Mother**

---

- Place sanitary pad or towel in position;
- sponge face, hands, legs and genital area;
- give a drink;
- cover her with a warm blanket; it is very common for the mother to have 'the shakes' straight after the birth;
- check pulse, temperature and respiration.
- check blood loss.

**Note:** If blood loss is excessive, firmly but gently massage above the uterus, which will be felt as a hard lump at the level of the navel. Also, putting the baby to the breast helps contract the uterus and stop bleeding.

Record all these events, observations, and time of delivery on Casualty Record sheet.

## 9.1 Emergency Childbirth

### Practical Incident

At a duty at a country fair, a woman in labour arrives at your first aid vehicle. Within 5 minutes she gives birth to her baby in your first aid vehicle. The baby is blue and makes no attempt to breathe. Continue from that point.

Checklist	Tick
<p><b>Position Baby</b></p> <p>Lay baby on mother's abdomen.</p> <p>Place baby in head down position, head to one side.</p>	
<p><b>Dry Baby</b></p> <p>Dry baby quickly.</p> <p>Cover baby with warm towel.</p>	
<p><b>Airway</b></p> <p>Open baby's mouth.</p> <p>Sweep mouth clear of mucus.</p> <p>Wipe nose free of mucus.</p> <p>Use suction, if available, to suck visible mucus from mouth and nose.</p>	
<p><b>Breathing</b></p> <p><b>No attempt to breath at one minute.</b></p> <p>Blow once onto baby's chest. Await response.</p> <p><b>No response.</b></p> <p>Place one hand on top of head.</p> <p>Place other hand at point of chin.</p> <p>Tilt head back slightly.</p> <p>Place your widely open mouth over baby's slightly open mouth.</p> <p>Puff gently.</p> <p>Watch for rise and fall of chest.</p> <p>Give 5 quick breaths.</p> <p>Respirations established - <b>No.</b></p>	
<p><b>Check Circulation</b></p> <p>Feel for apex beat; pulse is 40.</p> <p>Locate midpoint sternum using calliper method.</p> <p>Place 2 fingers over middle of sternum.</p> <p>Depress 15 mms at rate of 15 compressions in 10 seconds.</p> <p>Continue C.P.R. at rate of 12 inflations and 90-100 compressions per minute.</p>	
<p>Check after 1 minute</p> <ul style="list-style-type: none"> <li>- <b>respiration established - yes</b></li> <li>- <b>colour - pink</b></li> <li>- <b>heart rate - 120</b></li> </ul>	

Checklist	Tick
Warm baby warmly Give to mother.	

Practical skill mastered

Signed .....

Date .....

<b><i>Skills Mastered</i></b>			
	Satisfactory	Fail	Re-test
EXAMINER Please tick Please sign and print name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Signed: .....	Date ..... / ..... / 1993		
Name: .....	Position: .....		
Qualification: (Please tick where appropriate)			
Doctor .....	Registered Nurse .....	Ambulance Officer .....	
Training Branch Accredited Instructor: .....			
Operations Branch Member (approved by District Surgeon): .....			

## CONFIRMATION OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME, 1993

Name (*please print*) .....

Division ..... Date joined St John ..... / ..... / 19.....

Signed ..... Date ..... / ..... / 19.....  
Member to sign when Programme completed

The above member has completed the programme to my satisfaction:

Signed ..... Date ..... / ..... / 19.....  
Person responsible for training

Signed ..... Date ..... / ..... / 19.....  
Divisional, Corps or District Surgeon responsible for training

*To be completed if the member needs a Training Branch First Aid Certificate issued.*

The above member has satisfied the standards required by the Training Branch for Medallion accreditation or re-accreditation.

Signed ..... Date ..... / ..... / 19.....  
Training Branch Accredited Instructor

The above copy is to be retained by the member

The Superintendent/Officer-in-charge is to send only the bottom section of this page to the District Surgeon at Headquarters.

## CONFIRMATION OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME 1993

Name (*please print*) .....

Division ..... Date joined St John ..... / ..... / 19.....

Signed ..... Date ..... / ..... / 19.....  
Member to sign when Programme completed

The above member has completed the programme to my satisfaction:

Signed ..... Date ..... / ..... / 19.....  
Person responsible for training

Signed ..... Date ..... / ..... / 19.....  
Divisional, Corps or District Surgeon responsible for training

*To be completed if the member needs a Training Branch First Aid Certificate issued.*

The above member has satisfied the standards required by the Training Branch for Medallion accreditation or re-accreditation.

Signed ..... Date ..... / ..... / 19.....  
Training Branch Accredited Instructor