St John Ambulance Australia

SKILLS MAINTENANCE PROGRAMME 2001

ST JOHN AMBULANCE AUSTRALIA
NATIONAL CARDIAC ARREST DATA COLLECTION
UTSTEIN STYLE

Division or State/Territory Duty.....

Location of Duty.....Location of Casualty Inside ❒ Outside ❒
Tick appropriate box

Date: Day - Month - Year.....

Weather at time.....

Age of Casualty.....years Accurate ❒ Guess ❒

Sex of Casualty Male ❒ Female ❒

Pre-existing cardiac disorder (if known) Yes ❒ No ❒

Drugs taken (e.g. Anginine) Yes ❒ No ❒

Smoker Yes ❒ No ❒

Alcoholic odour Yes ❒ No ❒

Pre-arrest symptom (e.g. chest pain, pallor)

.....

Witnessed cardiac arrest Yes ❒ No ❒

Arrest after St John first aider arrived Yes ❒ No ❒

Arrest after Ambulance arrived Yes ❒ No ❒

Arrest after medical support arrived Yes ❒ No ❒

CALL RESPONSE INTERVAL.....minutes
(Period of time between receipt of call and arrival of St John first aider at casualty)

ASSESSMENT INTERVAL.....seconds
(Period from arrival of St John first aider till arrest assessed i.e. unresponsive, breathless, pulseless casualty)

TYPE of expired air resuscitation e.g. mouth to mask.....

.....

Time C.P.R. commenced.....hours and minutes (24 hour clock)

Time IF CIRCULATION restored.....hours and minutes (24 hour clock)

Time IF BREATHING restored.....hours and minutes (24 hour clock)

Time AMBULANCE CALLED.....hours and minutes (24 hour clock)

Time AMBULANCE ARRIVED.....hours and minutes (24 hour clock)

Time if C.P.R. ABANDONED.....hours and minutes (24 hour clock)

Time AMBULANCE DEPARTS WITH CASUALTY.....hours and minutes (24 hour clock]

Defibrillation performed Yes ❒ No ❒

Destination of Casualty (e.g. name of hospital and address if known).....

.....

Complete as accurately as information available permits

TYPE OF ARREST

1. PRESUMED CARDIAC
(e.g. coronary occlusion; myocardial infarction; cardiac arrhythmia) Yes ❒ No ❒

2. NON-CARDIAC e.g. Sudden Infant Death Syndrome..... Yes ❒ No ❒

Drug overdose..... Yes ❒ No ❒

Suicide..... Yes ❒ No ❒

Drowning..... Yes ❒ No ❒

Severe bleeding..... Yes ❒ No ❒

Or presumed cause

.....

If defibrillation used, what was the number of defibrillation shocks?.....

Who performed the defibrillation?.....

Were there any problems with the defibrillator?.....

What was the type of defibrillator used (e.g. brand name).....

Comments by first aider or duty officer to cover items not covered above or on the previous page

.....

.....

.....

.....

Signature of person completing proforma.....Grade.....

Printed name of person completing proforma.....

Current address.....Postcode.....

Age:.....years Sex: Male ❒ Female ❒ Years in St John:..... years

Current level of first aid accreditation: Senior ❒ Advanced ❒ Other.....

Add names, addresses and phone numbers of contacts - to assist in following up the casualty:

.....

.....

Please return this form, together with a **copy of the OB12 Casualty Report form** completed for the casualty with the suspected or confirmed cardiac arrest, as soon as possible, to:

Dr F.H.G.Bridgewater
C/o National Secretary, Volunteers
St John Ambulance Australia
P.O. Box 3895, MANUKA, ACT 2603

SMP 04

St John Ambulance Australia
OPERATIONS BRANCH

Skills Maintenance Programme 2001

Name .....

Signature .....

Division .....

Date received...../...../.....

St John Ambulance Australia
Canberra Avenue
Forrest ACT 2603

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Contents

Note:

'A.F.A.' refers to Australian First Aid. Third edition,1998.

Introduction to Skills Maintenance Programme 2001

To my esteemed fellow workers,

Asking questions is generally regarded as a tool in learning and something to be encouraged. However, it has been said that even a fool can ask a question that will confound the wise. There are different types of questions and different reasons for asking them. What is the start of the 21st Century? Why climb Mount Everest? If a tree fell in a dense forest, with no one within earshot, would it make a sound? These are examples of different types of questions. For some questions there are clear answers - for others, the response can be debated interminably. It has been suggested that the important factor is not a precise answer but rather a consideration of the outcome of basis for the question. What happens if there is a new centrury? What happens if I climb Mount Everest? What happens if...?

The start of the new century, or millennium, (which incidentally is on 1 January 2001!) is an opportunity to reflect and, looking at the events of the past, seek to change things favourably for the future. This will also be the value of the work by Ian Howie-Willis as he records the work of 'The Brigade' and 'Operations Branch' over a hundred years in Australia. Within St John Ambulance Australia Operations Branch's history, there will be events that will evoke the whole spectrum of emotional responses.

It would be wise of us to individually look back at our own involvement. Hopefully, for many there will be an element of justified satisfaction with a personal recognition of a job well done indeed! Honestly, for some there will be a bitterness of past ill-spoken words or deceitful actions. The new century provides a great opportunity, and if need be a challenge, to bury that bitterness and to get back onto good terms, to start working together towards a common goal as you help each other through this Skills Maintenance Programme 2001. That will take some 'guts' but I dare you to do it!

Sincerely in service

Franklin HG Bridgewater.
Chief Professional Officer

National Skills Maintenance Programme Training Committee Members and Contributors

Paul Arbon	Chief Superintendent
Stephen Baddeley	Territory Medical Officer (N.T.)
Kieran Brown	Training Branch Chairman (Tasmania)
Raymond Cook	Territory Medical Officer (A.C.T.)
Garry Coombes	Commissioner (S.A.)
Barbara Davis R.N.	State Officer (Victoria)
Wayne Deakes	Regional Officer (Victoria)
Diana de Silva R.N.	Divisional Officer (Victoria)
Professor Christine Duffield, PhD	State Nursing Officer (N.S.W.)
Nadine Fisher	Divisional Medical Officer (Victoria)
Stephen Hall R,N.	Nursing Officer (Victoria)
Gavan Keane	Ambulance Officer (Victoria)
Peter Lorimer, R.N.	Chief Nursing Officer
Gerry Meijer	State Medical Officer (Queensland)
Stephen Miller	Chief Ambulance Officer
Jeffrey Williams	State Nursing Officer (W.A.)
Chris Zeitz FRACP	State Officer (S.A.)

Procedure

A. St John Members

1. All members, on receiving their own copies of the Programme, should sign and date the title page.
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 in the Record of Skill Mastery at the end of Module 12.
4. Members who hold an Advanced Resuscitation Certificate, issued by their State/Territory, must sit the re-examination of that State/Territory every year to retain this qualification.

B. Officers/Training Personnel

1. The term ' training personnel' refers to all St John officers/members 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 State/Territory Medical Officer for consideration. All such requests will receive written advice.
2. 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.
3. Practical skills items pertaining to the module being undertaken must be signed as satisfactory by one of the designated persons.
4. 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.
5. **On satisfactory completion of the module** by the member, the programme is to be signed and dated on the Record of Skill Mastery at the end of Module 12.

The 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. Comments may be sent, in the first instance, to National Secretary, Volunteers, St John Ambulance Australia, Box 3895, Manuka, A.C.T. 2603. They will then be forwarded to the Training Committee.

Resuscitation

OBJECTIVES: On completion of the module, the member will:

1.1 competently and efficiently perform cardiopulmonary resuscitation (C.P.R.) for an adult on a manikin;

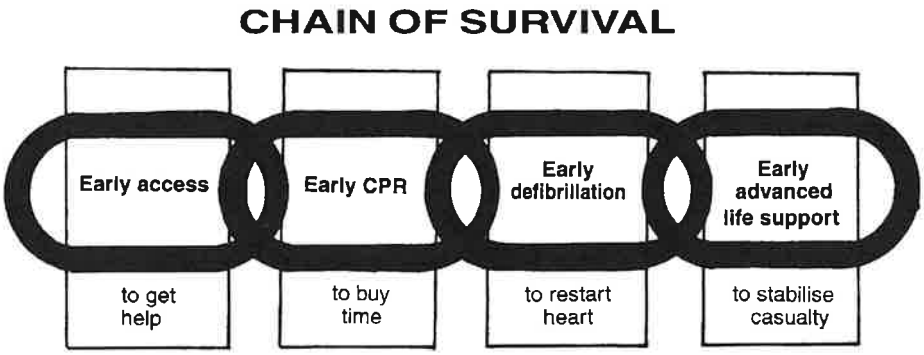
1.2 demonstrate an understanding of the resuscitationalgorithm for a collapsed/unconscious casualty.

Introduction

Resuscitation is the term given for those activities that are used to re-establish heart and lung function sufficiently to preserve brain function until more advanced life support is available.

To ensure that the casualty has the best possible chance of survival, a descriptive and linked process termed the Chain Of Survival has been adopted to emphasise the importance of each step in the management of cardiac and respiratory arrests.

The Chain Of Survival is made up of four critical links that must be kept intact. Each is dependent on the previous link to ensure that the casualty has the best possible chance of survival from cardiac and respiratory arrests.



1 Early access to the emergency response system

It is imperative to the potential survival of the casualty that an ambulance is called immediately so that early defibrillation and advanced life support can be commenced as soon as possible.

2 Early basic life support (B.L.S.)

To ensure that oxygenation is maintained to the vital organs of the body such as the brain, cardiopulmonary resuscitation (C.P.R.) must be commenced within 4 minutes of the heart stopping.

3 Early defibrillation

If defibrillation is initiated within minutes of the cardiac arrest, the chances of the casualty surviving are greatly enhanced.

4 Early advanced life support

Increased oxygenation, airway support and the administration of cardiac drugs by ambulance personnel further increase the likelihood of the casualty surviving.

The goal of the Operations Branch member in those situations, where a casualty has had a cardiac arrest, is to ensure that the length of time to activate each link of the chain is kept to a minimum. **A reduction in time equates directly to a corresponding increase in the survival rate of the casualty.** Refer to Module 12.

The Operations Branch member also has a responsibility to demonstrate calmness, competence and sensitivity in an environment that may be quite stressful when the immediate family, relatives and bystanders are present.

The D.R.A.B.C. Action Plan

The D.R.A.B.C. Action Plan provides the Operations Branch member with a direction for first aid management, ensuring that definitive care is delivered to the casualty with competence, confidence and compassion.

What are the components of the D.R.A.B.C. Action Plan?

(Discuss as a group activity)

Danger:
- To yourself. The person you should least want to get injured at any time is yourself. If you are injured, you cannot help others.
- To bystanders. If bystanders are injured, you suddenly have extra casualties to deal with and fewer people to help you.
- To the casualty. Remove the danger from the casualty or, if this cannot be done, remove the casualty from the danger, being careful not to aggravate any other injuries.

Response:
- Kneel beside the casualty, placing your hands on his/her shoulders, and gently shake and ask loudly "Can you hear me? Open your eyes."
- Always be on guard for the violent casualty and protect yourself as much as possible.
- A response indicates that the casualty is conscious. Do not move the casualty unless there is a possibility of further danger or airway obstruction.

Attend to the following immediately:
- Manage any life threatening injuries.
- Manage other injuries.
- Call for help.
- Calm and reassure the casualty.

If there is **No** response, roll the casualty into the **recovery position** while not aggravating any other injuries, (e.g. spinal injuries).

Demonstrate the recovery position and alternative recovery position.

(Group activity - Refer A.F.A., 1998, p.31 and pp.39-40)

Send for help or consider going to get help yourself if you are alone, but only if the casualty is in the recovery position and the airway is clear.

If the casualty is an infant or a child or if the collapse is likely to have been caused by near drowning or an injury, commence E.A.R./C.P.R. (if necessary) for one minute before seeking help. Leave the casualty in the recovery position. If the casualty is an infant or child, take the casualty with you if possible.

Airway:

- A casualty's airway is of the utmost importance.
- Open the casualty's mouth and clear any foreign objects with your fingers.
- Dislodged teeth and loose dentures should be removed but well-fitting dentures should be left in place.
- Clear the casualty's airway by gently tilting the head back and slightly down.
- At the same time, with your fingertip(s) under the point of the casualty's chin, lift the chin to open the airway.
- **Avoid excessive neck movement if trauma (injury) to the neck is suspected.**

Breathing:

Keeping the airway open, look, listen and feel for breathing **(more than an occasional gasp)** for up to 10 seconds before deciding that breathing is absent:

- Look for a rise and fall of the chest.
- Listen for breath sounds from the casualty's mouth.
- Feel for air on your cheek.

If the casualty is breathing (other than an occasional gasp):

- Leave the casualty in the recovery position.
- Call for immediate assistance.
- Assess Circulation and perform an examination of the casualty.
- Treat any injuries.
- Check for continued breathing.

If breathing is absent:

- Turn the casualty onto his/her back.
- Ensure head tilt and chin lift.
- Start Expired Air Resuscitation (E.A.R.) by giving 2 effective ventilations. (You can give up to 5 breaths to achieve 2 effective breaths).

Procedure:

- Open the airway.
- Place your hand on the casualty's forehead and pinch the nostrils closed with the index finger and thumb or seal nose with your cheek.
- Open the casualty's mouth and maintain chin lift.
- Take a breath and place your lips over the casualty's mouth, ensuring a good seal.
- Blow slowly into the casualty's mouth for about 1.5-2 seconds, watching for the chest to rise.
- Maintain head tilt and chin lift.
- Turn your mouth away from the casualty watching for the chest to fall and to listen and feel for signs of air being expelled.
- Take another breath and repeat the sequence to give at least two effective breaths. (i.e. 2 breaths in which the chest of the casualty both rises and falls).

If the chest does not rise and fall with every breath, check for:

- airway obstruction - open the casualty's mouth and remove any obstruction;
- adequate head tilt and chin lift;
- adequate seal around the casualty's mouth.

If still unsuccessful, move on to assessment of circulation.

Circulation

Assess the casualty for signs of circulation that include:

- checking if the carotid (neck) pulse is present (10 seconds);
- looking for any movement including swallowing or breathing (more than an occasional gasp);
- observing colour of skin on face.

Check for up to 10 seconds before deciding that the pulse is absent.

If you are confident that you can detect signs of circulation **within 10 seconds**:

- Continue rescue breathing at 1 breath every 4 seconds until the casualty starts breathing on his/her own.
- About every minute recheck for signs of circulation; **take no more than ten seconds each time.**
- If the casualty starts to breathe sufficiently on his/her own, place the casualty in the recovery position.
- Check the casualty's condition and be ready to turn the casualty onto his/her back and restart E.A.R. if breathing stops.

If there are no signs of circulation or if you are unsure, commence cardiopulmonary resuscitation (C.P.R.):

- Locate the lower half of the sternum (breastbone).
- Find the sternal notch at the base of the neck.
- Find the lower end of the sternum by running a finger along the last rib to the centre of the body.
- Extend the thumb of each hand equal distances to meet in the middle of the sternum.
- Identify the portion of the sternum immediately below this mid-point and place the heel of your hand over the sternum.
- Place the heel of your second hand on top of the first (Refer to A.F.A., 1998, p. 36).
- Interlock the fingers of both hands and raise the fingers to ensure that pressure is not applied over the casualty's ribs. (Alternative positions, e.g. wrist grip, may be used.)
- Do not apply any pressure over the upper abdomen or bottom tip of the sternum.
- Position yourself vertically above the casualty's chest and with your arms straight press down on the sternum to depress it about 5cm (about 2 inches).
- Release the pressure; then repeat at a rate of 80-100 times a minute (a little less than 2 compressions per second). Compression and release should take an equal amount of time.
- After 15 compressions, tilt the head and lift the chin and give two breaths.
- Combine E.A.R. and compression; give two effective breaths.
- Return your hands immediately to the correct position on the sternum and give 15 further compressions, continuing compressions and breaths in a ratio of 15:2.
- Check pulse about every minute.

Cardiopulmonary resuscitation must be continued until:

- the casualty shows signs of life;
- medical help arrives;
- continuing resuscitation becomes dangerous to the Operations Branch member (exhaustion, weather extremes etc.).

Should cardiopulmonary resuscitation be discontinued, note the time it was ceased and length of time it was performed on the casualty and document on an OB12 Casualty Report form.

If the casualty regains a carotid pulse, the member should continue to support respirations through Expired Air Resuscitation (E.A.R.) or Bag-Valve-Mask with oxygen.

When both breathing and circulation have been restored:

- Place the casualty in the recovery position.
- Call for urgent medical assistance (if not already sought).
- Assess and examine the casualty.
- Treat any life threatening injury.
- Continue to closely monitor casualty through the use of the D.R.A.B.C. Action Plan.

Question: What additional strategies would you adopt if the casualty were a woman who had a cardiac arrest and was in an advanced stage of pregnancy?

Answer:

- Position casualty on her back with shoulders flat to the ground.
- Place padding under the casualty's right buttock to tilt her pelvis to the left.
- If there is insufficient padding available, a second person, e.g. a bystander, should be asked to hold the casualty's abdomen to the left side while C.P.R. is being performed.

A tilt of 15º approximately should be sought by the member to facilitate uterine circulation and venous return back to the heart. If the casualty's pelvis is not tilted to the left, the pregnant uterus will compress major blood vessels impeding both arterial and venous circulation.

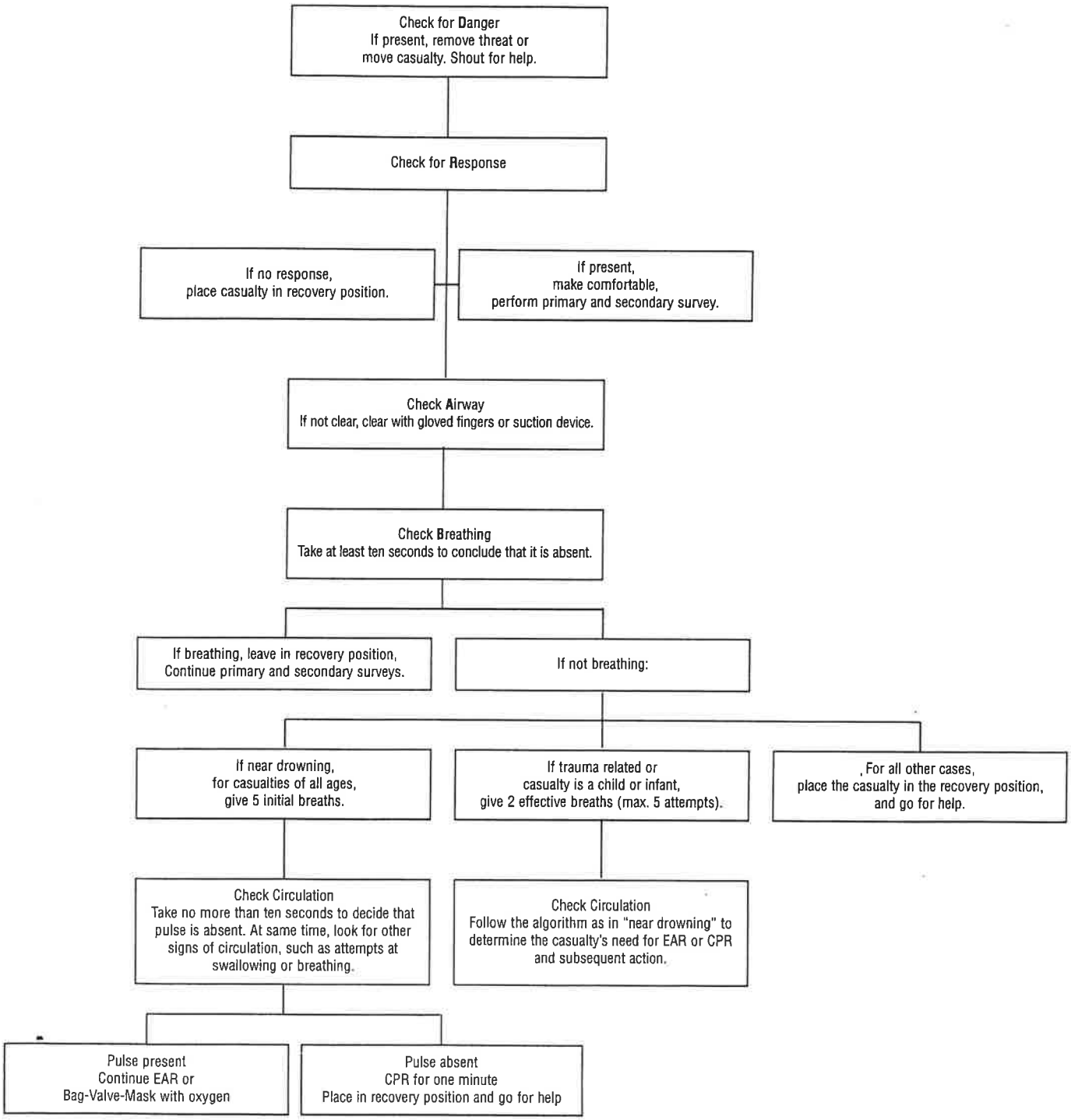
RESUSCITATION RATES

	9 years and older	1-8 years	0-1 year old
INITIAL VENTILATION IN NEAR DROWNINGS	Give 5 initial breaths in all age groups		
INITIAL VENTILATION IN OTHER EVENTS	2 effective* breaths at 1.5-2 seconds each Maximum of 5 attempts#		
E.A.R.	1 breath every 4 seconds 15 breaths/min.	1 breath every 3 seconds 20 breaths/min.	1 breath every 3 seconds 20 breaths/min.
COMPRESSION SITE	Lower half of sternum		
HOW	2 hands	1 hand	2 fingers
DEPTH	4-5cms	One third of depth of chest	One third of depth of chest
ONE OPERATOR	15 cardiac compressions to 2 breaths in 15 seconds; 4 cycles/min.	5 cardiac compressions to 1 breath in 5 seconds; 12 cycles/min.	5 cardiac compressions to 1 breath in 5 seconds; 12 cycles/min.
TWO OPERATORS	5 compressions to 1 breath in 5 seconds 12 cycles/min.	5 compressions to 1 breath in 5 seconds 12 cycles/min.	Not recommended

* 'effective' means that the chest is seen to rise and fall.
# If after five ventilations, two 'effective breaths' have not been achieved, the next step in the resuscitation algorithm must be taken.

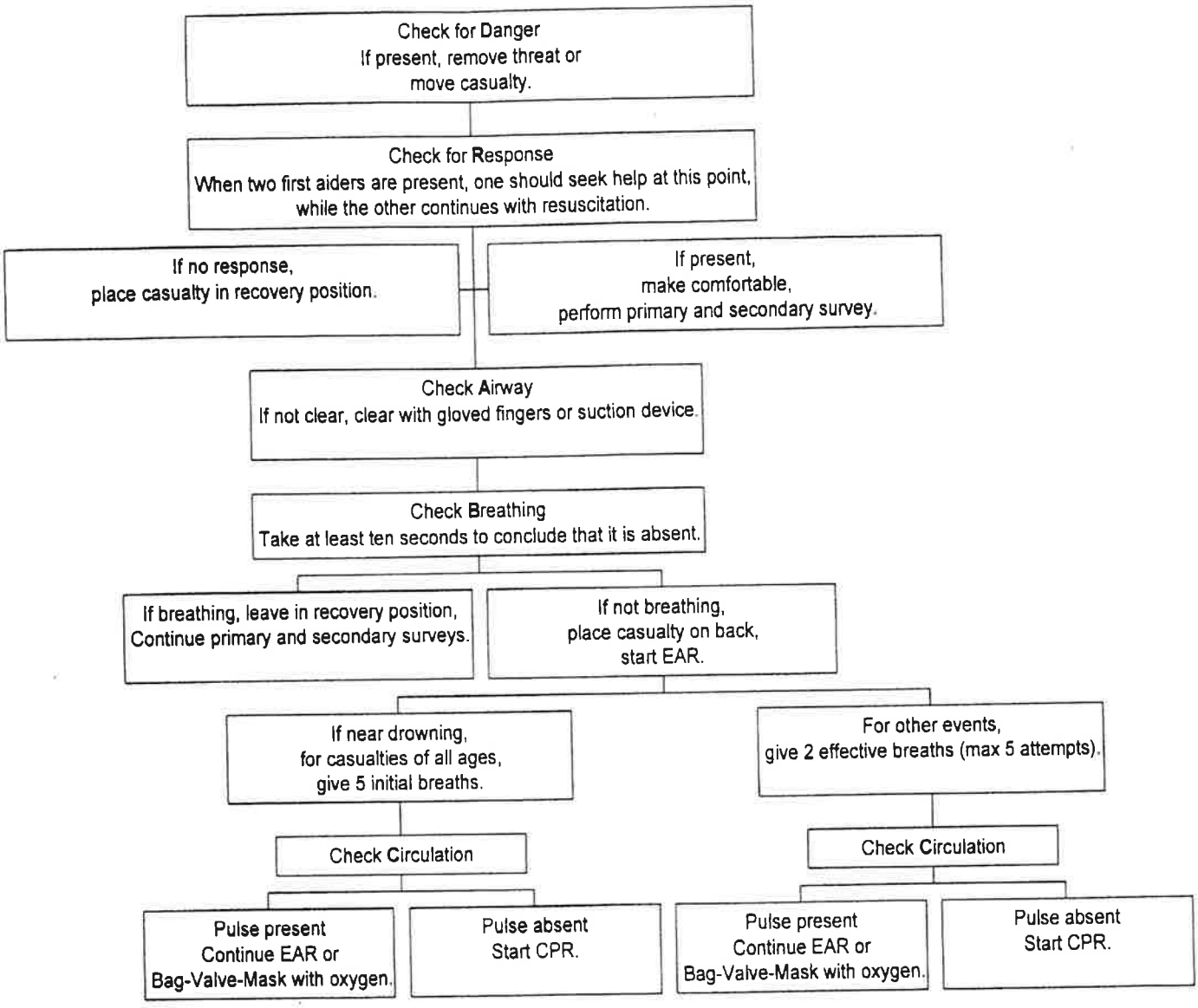
Resuscitation algorithms for a collapsed/unconscious patient

Single operator



* If the casualty is an infant or child, and it is possible, take them with you while you seek help and continue resuscitation.

Two Operators



1.1 *Perform effective resuscitation for an adult*

Resuscitation Assessment

You are called to an unconscious casualty. When you arrive, a member of the public is attempting C.P.R. You have a pocket mask and gloves. Manage the casualty as you normally would.

	Checklist	Needs Improvement Date	Proficient Date
DANGERS	(No) You, others, casualty.		
RESPONSE	(No) - Recovery position. - Send bystander for help; use radio for ambulance.		
AIRWAY	(Vomitus) - Digital clearance/suction, if available and trained to do so. - Insert oropharyngeal airway, if available and if trained.		
BREATHING	(Nil/Agonal gasps) - Roll onto back - Good seal. - 2 effective breaths. - Watch rise/fall of chest.		
CIRCULATION	(Yes)		
COMMENCE E.A.R.	- Rate: 1 breath/4 seconds. - Good seal. - Watch rise/fall of chest.		
REVIVAL CHECK at approx. 1 minute	- Breathing (Nil). - Circulation (Nil).		
COMMENCE 1 PERSON C.P.R. at ratio 15:2.	- Good seal. - Watch rise/fall of chest. - 15 compressions. - Location: lower half of sternum. - Depth: 4-5 cm. - Rate: 4 cycles/minute.		
SECOND MEMBER arrives with pocket mask.	- Member being assessed to ventilate casualty. - Check that ambulance has been called; if not, call.		
COMMENCE 2 PERSON C.P.R.	- Ratio of 5:1 at 12-15 cycles/minute. - Good seal. - Watch rise/fall of chest.		

	Checklist	Needs Improvement Date	Proficient Date
CASUALTY VOMITS	- Turn casualty on side. - Digital clearance on side. - If trained, use mechanical suction. - Return casualty to back - Continue ratio of 5:1.		
AMBULANCE	Hand over.		
RELATIVE ARRIVES	If possible, obtain history and complete OB 12 Casualty Report form.		
GENERAL	- Calls for help at appropriate times. - The ambulance must be called immediately to ensure that early defibrillation and advanced life support can commence without delay. - Use of Standard Precautions.		

This skill may be undertaken to fulfil criteria relevant to the Declaration of Continued Fitness for Public First Aid Duties (Refer to back of text).

Agonal Respirations

The ILCOR Advisory Statements on Single-Rescuer Adult Basic Life Support use the phrase 'occasional gasp'. This is an accurate, lay description of agonal respirations. These are abnormal, ineffective, uncoordinated respiratory movements occurring for a while after cardiac arrest. 'Agonal respiration' is preferred to the term 'agonal breathing' as the latter may imply some effective breathing activity. Agonal respiration is common in the first minute after arrest and may persist for some minutes. The presence of agonal respiration may mislead an observer and delay the commencement of C.P.R. One should not be surprised, and even might expect, to find that there is no palpable pulse in a casualty with agonal respiration.

Breathing is considered present, by ILCOR, if there is 'more than an occasional gasp'. The corollary arises when considering effectiveness of circulation. An 'occasional gasp' must not be thought to indicate vitality. C.P.R. should be commenced.

Orientation and Safety

REFERENCES:

St John Ambulance Australia 1998, *Australian First Aid.* Third edition, pp. 269-286.
St John Ambulance Australia Operations Branch 1999, *General Regulations*, p.6 and pp.58-69.
St John Ambulance Australia 1999, *Welcome to St John, Tips for New Operations Branch Members*, Third edition, p.5.

TRAINING OUTCOMES:

At the end of this learning session, the member will be able to:

2.1 describe the national and state structure of St John Ambulance Australia;
2.2 refer to the annual efficiency requirements for Operations Branch members;
2.3 appreciate the responsibilities and ethics required of the Operations Branch member;
2.4 understand the role of St John in liaising with emergency services, statutory services, the general public and specialist groups;
2.5 appreciate the legal obligations (including duty of care) of members;
2.6 identify and assess risk presenting at an emergency;
2.7 control risk factors at an accident scene.

St John Ambulance Australia - The Organisation

St John Ambulance Australia is part of an international Royal Order of Chivalry whose official title is 'The Most Venerable Order of the Hospital of St John of Jerusalem'. Although it is the Sovereign Military Order of Malta which is the direct successor of the Knights of St John of Jerusalem, St John Ambulance Australia which evolved from the Most Venerable Order in Britain, retains many of the symbols, titles, language, ceremony and heritage of the Knights who go back as far as 1099AD.

St John has four Foundations all of which operate in Australia:

* The Training Branch (teaching of first aid)
* The Operations Branch (rendering first aid to the public)
* The Community Care Branch (rendering care to the public)
* The Ophthalmic Branch (supporting eye care in the Order's Jerusalem Eye Hospital)

The Governing Body of the Order in Australia is known as the Priory Chapter which meets once each year. The titular head is the Prior who is the Governor General of Australia. The Chief Executive Officer of the Priory Chapter is known as the Chancellor*. Priory Chapter also comprises:

Vice Chancellor*

Representing the four foundations:
Director of Training*
Chief Commissioner*
Chair Community Care*
Hospitaller*

Receiver General*
Priory Secretary*
Librarian
Registrar
Director of Ceremonies
Members of the Order elected by each State and Territory Council

The National Executive Committee meets several times each year to advise the Priory Chapter. It includes the Priory Officers (asterisked above) and the Chairs of each of the State and Territory Councils.

The national Operations Branch Standing Committee comprises:
Chief Commissioner
Chief Superintendent
Chief Professional Officer
Chief Officer (Cadets)
State and Territory Commissioners
Priory Secretary
Director of Training
Deputy Director of Training

The National Headquarters is situated at Forrest near Manuka, an inner suburb of Canberra.

Each State/Territory is headed by a Commissioner. The Commissioner delegates his/her authority as follows:

1. *At State/Territory Level*
   - Deputy Commissioner
   - State/Territory Superintendent
   - State/Territory Medical Officer
   - State/Territory Nursing Officer
   - State/Territory Ambulance Officer
   - State/Territory Officer (Cadets)
2. *At Regional and Divisional Levels*
   - Regional Superintendents and other Regional Officers
   - Divisional Superintendents and other Divisional Officers

Exercise

Attempt a structural drawing of the national and State/Territory organisation of St John Ambulance Australia. Use your illustration as the basis for a short address to all divisional members on the basic organisational structure of St John.

Exercise

Discuss with your fellow members and try to place names against as many of the positions held as possible.

Responsibilities and Ethics

The Preamble of the Operations Branch General Regulations provides an insight into the responsibilities and ethics expected of members:

St John should continue as a charity in the Australian community. The motto "For the Service of Humanity" is unreservedly reaffirmed. Its vision for the future, whether acting alone or in partnership with others, is the provision of charitable and humanitarian services to individuals, groups and organisations. Its relief work for persons in sickness, distress, suffering or danger recognises no barrier of race, colour or creed. Funds raised for the services St John provides are viewed simply as a means of achieving its overall humanitarian objectives. Fundraising is not, nor will be allowed to become, an end in itself. St John takes pride in its volunteer ethos, its ethical standards and in its independence. These together provide the firm foundation on which St John decides for itself the best means of achieving the objectives to which it is dedicated.

Exercise

Extract from the above Preamble three or four elements which constitute the ethical essence of St John Ambulance. Discuss the importance of each.

* .....
* .....
* .....
* .....

General Regulation 8.1 denotes the primary responsibility of the Operations Branch member - the rendering of first aid:

It is the duty of members of the Operations Branch to render first aid, when necessary, irrespective of time or place and whether in uniform or not. Membership of the Operations Branch does not, however, confer upon individuals the right to take up a position in the streets or elsewhere on public or other occasions for the purpose of rendering first aid, nor to force their services upon persons who may be injured or in need of assistance.

Approved Casualty Report Forms are to be used in respect of all casualties treated or advised, in accordance with instructions issued from time to time by the Chief Medical Officer. Management of such casualties shall be undertaken using a first aid kit, the contents of which have been approved by the Chief Medical Officer.

Small Group Discussion Questions

1. Does a member's duty cease when he/she is not in uniform?
2. Imagine a situation in which a member does not treat but simply advises a member of the public to see a medical practitioner. Is there any need to complete a Casualty Report Form? Why?
3. Why do you think Operations Branch first aid kit items must be approved by the Chief Medical Officer?

The Operations Branch Member and The Law

Laws exist in statutory/regulatory form (enacted by Parliament or delegate) and at Common Law (the law which has evolved from court case judgements).

Some statute law specifically covers activities relating to first aid (Occupational Health and Safety being an example). Operations Branch members are subject to such laws as they apply.

The Law of Negligence is largely a Common Law matter requiring three essential elements before negligence has occurred:

- there must have been a **duty owed by the member** to the complainant (plaintiff);
- the **duty owed was breached** by the member;
- the **complainant suffered some damage** as a result of the breach.

Exercise

Imagine a situation in which a member of the Operations Branch needlessly shifts a casualty who has fallen from a grand stand.

What is the duty owed to the casualty in such a circumstance?

.....

Do you believe that duty has been breached in this case? Why?

.....

What needless damage might the complainant have suffered?

.....

Hypothetical cases such as the above remind members of their duty of care as first aiders (including the need to stock only those items of first aid equipment which are approved).

The *Welcome to St John* booklet (issued to new members) states:

As an Operations Branch member carrying out first aid, you have a responsibility of care for all persons and special care for the casualty. Do what you can, within the scope of your training, to safeguard the casualty and others from injury or aggravation of injury. You do not have a medical or paramedical role. You are mainly concerned with safety, comfort and reassurance of the casualty and, if necessary, seeking medical aid. Your first aid equipment must be restricted to the approved list. Treatment must be confined to what you have learnt from the authorised St John manuals. These precautions will normally ensure your protection under Operations Branch insurance policies.

Efficiency Requirements

Following are the broad requirements for Efficiency as laid down in General Regulations:

a. successfully undertake Skills Maintenance Programme
b. carry out roles/functions to the satisfaction of the State/Territory and of their senior officer
c. perform 60 hours of service (including 12 divisional instructional meetings)

(Refer to the Regulations for information on exemptions and other detail)

Exercise

General Regulation 7.1 (d) requires 60 hours of service per annum. Refer to General Regulation 7.1.1 (a) (iv) to find out the meaning of 'service'.

Exercise

Members are required to be physically fit to perform public duties. Refer to General Regulation 7.1.1 (b)(ii) to find out how physical fitness is assessed.

Exercise

I joined the Operations Branch on 14th June. Can I be efficient for the calendar year? Refer to General Regulation 7.4 for the answer.

Exercise

What happens if a member fails to meet the efficiency requirements? Refer to General Regulation 7.7. for the answer.

Risk Assessment and Control

The D.R.A.B.C. action plan is the first priority at any accident scene. In assessing DANGER, the first aider endeavours to ensure that everyone present is safe.

Hazards may be identified at the scene under the categories of obvious, potential and hidden.

Eliminate, Guard and Warn is a useful summary for the first aider:

Hazards to be *eliminated* can be electricity, gas, obstructions and oncoming traffic.
Guarding the area might entail the stopping of vehicles, control of bystanders and the wearing of appropriate protective equipment (e.g. reflective vests and gloves).
Warning entails telling others of dangers including the erection of warning signs as appropriate.

At a vehicle accident, the first aider's vehicle should be parked safely with hazard lights switched on. At night, the general scene can be illuminated with headlights. Any observed dangers should be removed if possible OR it may become necessary to remove the casualty (for example, from fire) if this is more appropriate.

If the accident involves a vehicle with hazardous materials, all should stay clear of the accident scene. The first aider should note any clouds of vapour, spilt volatile liquids and gases and any unusual odours. Emergency services will be required to mitigate such dangers including knocked-down high voltage power lines which must be given a 6 metre clearance by all others attending the scene. Vehicles in contact with a high voltage cable are not to be approached. Occupants of such vehicles should remain inside until such dangers have been removed

If there is an extreme life-threatening situation, they will need to jump clear **without touching the vehicle and the ground at the same time.**

The handbrake of a damaged vehicle should be applied if possible and the vehicle placed in gear. Blocks should be placed against the wheels. The ignition should be turned off.

When calling for assistance, the first aider calls '000' for the ambulance first, then the police. On digital phones, dial '112'. If there is a danger associated with high voltage electricity and/or there are spilled chemicals and/or a danger of fire, the telephone operator should be advised to ensure that the appropriate services are contacted.

Exercise

By referring to *A.F.A.*, p. 275, complete the following table which lists the information which should be conveyed when calling emergency services:

In a city or town, give:	In a rural area, give:	If a road accident, give:
Number of casualties	Number of casualties	Number of casualties
Types of injuries	Types of injuries	Types of injuries

In the case of major accidents, a site control centre should be established. It should be easily accessible, preferably in an elevated position to facilitate an overview of the accident area and as near to the accident site as possible.

Wounds

REFERENCE: St John Ambulance Australia 1998, Australian First Aid, Third edition, pp. 96-116 and 147-149.

OBJECTIVES: On successfully completing the module, the member will be able to:

3.1 describe the different types of wounds;
3.2 describe the principles of wound management;
3.3 outline the key responsibilities of the first aider in the assessment of crush injuries;
3.4 state the first aid management of a casualty with a crush injury;
3.5 demonstrate the first aid management of a casualty with a penetrating chest wound.

Introduction

A wound is any disturbance in the continuity of structures of the body caused by physical means that include mechanical injury or surgery.

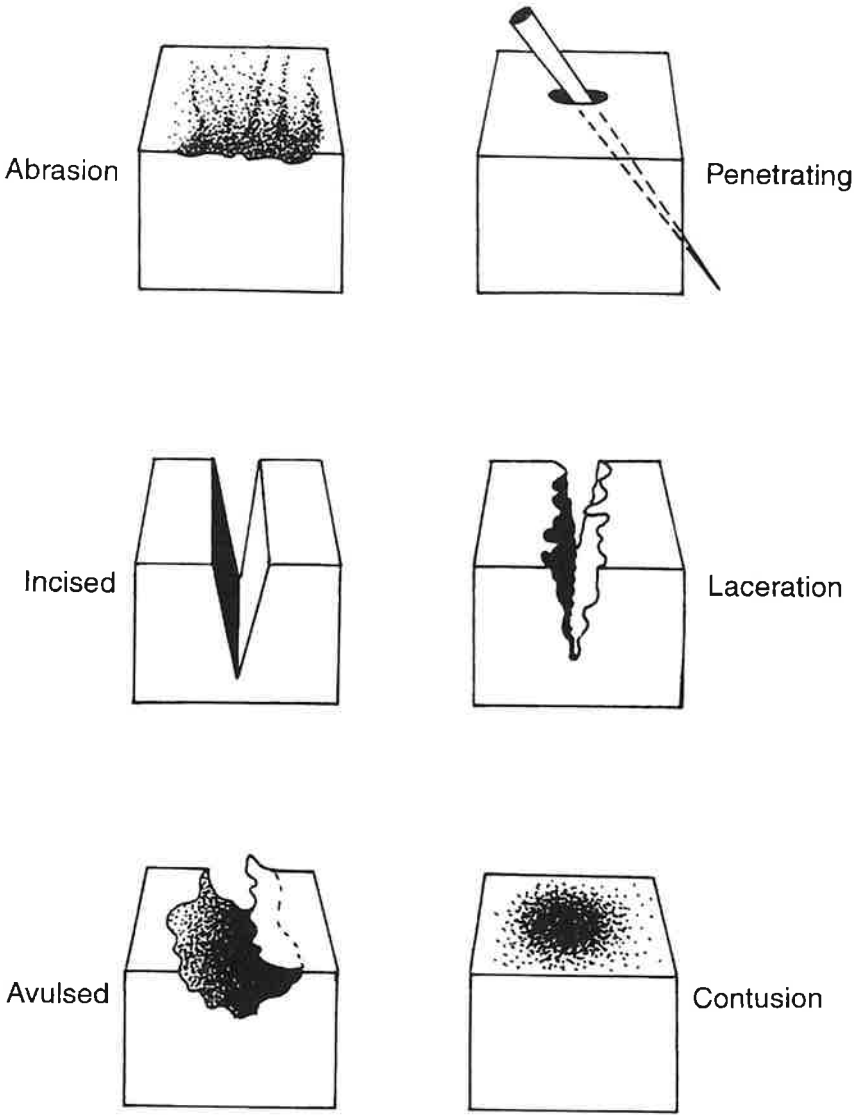
Assessment

A wound is classified as open or closed and assessed according to:

- the location of the wound;
  - wound healing will be dependent upon the site of the wound.
- the cause of the wound;
- the type of the wound:

* Bruise (Contusion)	* Vessels under the skin bleeding into surrounding tissue. * Caused by: falls, blows or crushing (blunt force).
* Abrasion	* Outer layer of skin and tiny underlying blood vessels exposed; described as a dirty, raw, oozing area. * Caused by: rubbing or scraping over a rough surface.
* Incised (Cut)	* Wound with cleaned edges and can involve skin, soft tissues, blood vessels and muscles; these types of wounds can bleed profusely. * Caused by: sharp objects that include knives and glass.
* Lacerated (Tear)	* Wound with torn, irregular edges; may have surrounding tissue bruising; these types of wounds may also bleed profusely. * Caused by: blunt or jagged objects.
* Penetrating (Puncture)	* Wounds where an object has penetrated underlying tissues and/or organs; usually has a small entrance in the skin but its depth may be undetermined. * Caused by: knife and gunshot wounds.
* Avulsion	* Tearing of the skin and often with a skin flap, with or without removal of underlying tissue; these wounds may also bleed profusely.

- the size of the wound:
  - measured in millimetres or compared with a standard measure, e.g. a 10 cent piece;
- the depth of the wound:
  - superficial - there is damage to the skin;
  - deep - underlying tissues are visible, e.g. muscle, tendon or bone;
- pain:
  - onset, duration, location, factors which increase or decrease the pain;
- condition:
  - the wound is new;
  - the wound is old (healing well or not);
  - the condition of the surrounding tissue.



It is important to consider the casualty's previous medical history when assessing a wound (Is the casualty a diabetic, does he/she smoke, does he/she have any allergies?) as some conditions can affect the healing ability and time. These findings should be documented on the OB12 Casualty Report form.

Wounds to the Head and Ear

Bleeding from the scalp
The scalp is the area of head, excluding the face, that is usually covered by a growth of hair. The head is vulnerable to injury because of the superficial covering of tissue and the absence of any padding as in other areas of the body.

Blood loss from scalp wounds can be excessive especially in children. If the adult casualty is shocked in the presence of a scalp wound, the injury to the scalp alone is not generally the cause of the shock.

The first aider should carefully inspect the wound for signs of a skull fracture or foreign material.

Provided there is no underlying fracture, bleeding from a scalp laceration can usually be controlled by direct pressure.

Management of bleeding from the scalp

1. D.R.A.B.C.
2. Adopt Standard Precautions (refer to Module 6).
3. **Fracture suspected:**
   Control bleeding with gentle pressure around the wound.
4. **Absence of any fracture:**
   Control bleeding with firm, direct pressure, using a pad if possible.
5. The casualty may be placed into the sitting position if there are no contraindications such as other injuries or the general condition of the casualty.
6. Monitor the casualty's condition.
7. Refer casualty to medical aid.
8. Complete an OB12 Casualty Report form.

Ear Wounds

Injuries to the ear usually involve the outer soft tissue and result from blunt force caused by falls, assaults or clashes on the sports field. **Bleeding from the external structures of the ear can be controlled by applying pressure to the affected area.**

It is imperative that the first aider, in examining the casualty, excludes head injury or damage to the internal structures of the ear. If there is no obvious bleeding from the external structures of the ear, in the presence of cerebrospinal fluid (a clear watery substance) with or without blood, a fracture of the skull should be suspected.

Management of Ear Wounds

If there is bleeding from within the ear:

1. D.R.A.B.C.
2. Adopt Standard Precautions (refer to Module 6).
3. **Do not plug ear canal.**
4. **Do not administer drops of any kind.**
5. Allow fluid to drain freely.
6. Place casualty on side with affected ear down.
7. Place a sterile pad between ear and the ground.
8. Refer casualty urgently to medical aid.
9. Complete an OB12 Casualty Report form.

Major Wounds

Penetrating Wounds

Penetrating wounds are the result of injuries caused by low energy weapons (e.g. knives) or medium to high-energy weapons (e.g. handguns, crossbows or high powered rifles).

Irrespective of the type of weapon used, the first aider should consider all penetrating injuries to be of a serious nature. A simple entrance wound may be assessed as small but the internal damage that is unseen could nevertheless be extensive. Internal injuries cannot be determined in the field, but the possibility must always be suspected. When examining a casualty with a stab wound, it is important to consider the potential for multiple wounds. Hence, a thorough inspection of the casualty must be undertaken.

The first aider, in assessing a casualty as the result of penetrating trauma, should observe for both entrance and exit wounds. The first aider, in assessing injuries to the casualty, considers that tissue damage will occur at the site of entry into the body, path of the weapon's entrance and upon exit from the body.

Management of Penetrating Wounds

1. D.R.A.B.C.
2. Adopt Standard Precautions.
3. Control bleeding – apply direct pressure around the wound.
4. Keep wound as clean as possible.
5. Cut away or remove clothing covering wound.
6. If wound is not bleeding, carefully clean out loose dirt.
7. **DO NOT** try to pick out foreign material embedded in the wound.
8. **Apply a sterile or clean dressing.**
9. Rest the injured part in a comfortable position.
10. Seek urgent medical aid.
11. Complete OB12 Casualty Report form and continue observations regularly.

Further reading:

A. F.A. , 1998, pp.147-149, Penetrating Chest Wound.

Crush Injuries

Introduction

Crush injury results from the application of a crushing force (e.g. heavy weight) to any part of the body, often causing bursting of the skin. Incidents which may lead to crush injury include motor vehicle accidents, tree felling, building/structure collapse, being caught in industrial machinery, mine cave-ins, avalanches and earthquakes.

Effects of crush injury

When tissues are crushed, they release toxins which, while the crushing force is in place, are trapped in that part of the body. The blood supply may also be cut off and the crushed area deprived of oxygen. Subsequently, these agents are released into the general circulation and can cause serious complications. This is referred to as the *crush syndrome.* This issue will be addressed in hospital and the possibility that it may occur should not delay rescue, release or first aid at the accident site.

Management

Where a casualty is trapped by a crushing force, a rapid assessment needs to be undertaken. This assessment should look at:

- risk involved;
- what the nature of the force is;
- what part of the body is crushed;
- if any other personnel/equipment is required to remove the force.

Risks involved

It may not be possible to extricate the casualty or remove the crushing force immediately. **It is always necessary to make the area safe to work in before beginning any extrication.** To determine this may require other personnel with specific expertise to be called to the site. It can sometimes take hours, or even days, to ensure that the site is safe. This, of course, will be particularly frustrating for those waiting to attempt to rescue and especially those awaiting rescue.

Previously it has been believed that management could be determined by a consideration of how long the casualty had been crushed. This was considered a factor in assessing the risk to the casualty. This has not been supported by clinical experience.

What is the nature of the crushing force?

If a 'simple' object is the cause of the crushing force, it may be a reasonably quick procedure to extricate the casualty. However, in the majority of cases, it is not a simple procedure.

Where the force is:

- due to natural disaster, there may be tons of debris that need to be removed prior to reaching the casualty;
- an industrial machine, it may need to be dismantled to get to the casualty;
- a motor vehicle, you may need to cut away the tangled wreck.

What part of the body is crushed?
Crushing injuries of the head, neck, chest or abdomen can cause rapid death by interfering with breathing and circulation.

First Aid

- D.R.A.B.C.
- Remove the crushing force as quickly as possible, while ensuring your own safety.
- Seek urgent medical aid.
- Control bleeding.
- Cover all open wounds.
- Keep casualty comfortable while waiting for urgent medical aid.
- Administer oxygen via a face mask at 8 litres/minute, if available, and you are trained.
- Provide pain relief if you have the facility and are trained in its use.
- **Never use tourniquets.**

After events
Apart from cleaning up the area, it will be necessary to arrange for counsellors to be available for those who have been traumatised by the events.

Further reading:

Pearn, J., Leditschke, J.F., Marshall, V., Williamson, J., Bowler, P. Crush Injury in *The Science of First Aid*. St John Ambulance Australia, 1996, Chapter 14, pp.125-128.

Exercises

Group or individual – Open Pneumothorax

Attempt to answer the following questions prior to undertaking the practical incident. Answers to these questions have been placed at the end of the module.

1. What is an open pneumothorax?

2. Why is the occlusive dressing over the chest wound taped on **three sides** only?

3. What is a tension pneumothorax?

3.1 Manage a penetrating chest wound

Practical incident

You are called to an incident where a casualty has been assaulted and stabbed in the chest with a knife.

Checklist	Needs Improvement Date	Proficient Date
Primary Assessment **D**anger On approaching the casualty, observe the scene for dangers: - to yourself (e.g. the knife); - to others; - to the casualty (seek early police assistance if necessary).		
Response (Yes). - Speak to the casualty. - "Lie/stay still - don't move" (casualty to be kept in the most comfortable position). - "I am a first aider and I can help you". - "My name is .....". - "What is your name?" - Clues for possible injuries.		
Airway - Visibly check airway (mouth). - Maintain a clear and open airway.		
Breathing (Yes). - Ask the casualty what happened - "Tell me what happened". - Place the casualty in a position (sitting up with injured side down) that facilitates breathing. - Alternatively, place the casualty in the recovery position if there is breathing difficulty, if vomiting is likely, or if the casualty becomes unconscious. - Explain to the casualty that you are going to undertake an examination. - Remove or cut clothing to expose the wound. - Cover the wound - use the casualty's or your own hand (to stop air flowing in and out of the chest cavity). - Cover the wound with a dressing (such as a plastic sheet, bag or aluminium foil) - if not available use a sterile dressing or pad. - Seal with tape on three sides (not bottom). - Administer oxygen therapy via a face mask at 8 litres per minute.		
Circulation (Yes). - Check for and control haemorrhage (refer to Module 7 on Haemorrhage). - Treat for shock (refer to Module 8 on Shock).		

Checklist	Needs Improvement Date	Proficient Date
Secondary Assessment Full examination of casualty. - Reassure the casualty. - Loosen tight clothing. - Obtain a history of events from the casualty; . **A**llergies; . **M**edications currently used; . **P**ast illnesses/**P**regnancy; . **L**ast meal; . **E**vents/**E**nvironment related to the injury. - **C**heck casualty for an alert bracelet, e.g. Medic Alert. - **E**xclude other injuries: look, listen and feel. Check for wounds, fractures, etc., from head to toe. - Treat any injury. - Refer casualty urgently to medical aid. - Check: . pulse; . respiration, rate, depth and effort (use of accessory muscles of respiration); . blood pressure and; . skin colour. - Check level of consciousness: . **A**lert; . **V** Responds to **V**ocal stimuli; . **P** Responds only to **P**ainful stimuli; . **U**nresponsive to all stimuli. - Check pupil response and size. - Recheck pulse, respirations and blood pressure, level of consciousness, pupils and chest wound every 15 minutes.		
General - Complete OB12 Casualty Report form. - Use of Standard Precautions. - Reassurance and support of relatives and or friends. - Ambulance handover.		

Answers to questions - refer to exercise as above - Open Pneumothorax

1. What is an open pneumothorax?

An open pneumothorax or sucking wound of the chest can occur following trauma and is a defect or perforation to the chest wall that results in pressure equilibrium between the atmosphere and that of the chest.

Instead of the normal passage of air to the lung, air enters through the chest defect and path of least resistance and the lung does not work effectively. This process results in severe hypoxia and compromise to the casualty.

2. Why is the occlusive dressing over the chest wound taped on three sides only?

The occlusive dressing that is taped on three sides only provides a flutter valve effect. When the casualty breathes in, the occlusive dressing is sucked in, sealing the wound or defect and preventing air from entering through the path of least resistance in the chest wall. When the casualty breathes out the unsealed section of the occlusive dressing allows air to escape.

3. What is a tension pneumothorax?

Air enters the pleural space because of a one-way air leak from the lung or through the chest wall, with progressive increase in pressure within the pleural space resulting in compression and collapse of the affected lung. If the tension pneumothorax is not resolved through urgent medical intervention, the heart will be moved to one side of the chest and the casualty may die.

Reference:

American College of Surgeons, 1997, *Advanced Trauma Life Support Program for Doctors*, Sixth Edition, American College of Surgeons, United States of America.

Wound Care

REFERENCE: St John Ambulance Australia, 1998, *Australian First Aid*, Third edition, pp. 72-73 and 93-101.

OBJECTIVES: On successfully completing the module, the member will be able to:

4.1 describe the principles of wound management;
4.2 state the signs and symptoms of a wound infection;
4.3 state the ongoing advice you would give to a casualty after you have treated a minor wound on duty;
4.4 demonstrate the care of a wound using a no touch technique.

Introduction

Most wounds may be dealt with in a first aid setting using basic dressing techniques. However, some wounds will require ongoing management and care. Casualties with wounds that are contaminated or have dirt in them may require a tetanus booster. (Refer to Recommended Immunisation Table at the end of this module).

Examples of wounds which may require further assessment and treatment include:
- injuries to the fingers, face or genitalia;
- deep wounds or those with an embedded foreign object;
- dirty wounds;
- wounds which cause loss of function, which may indicate damage to deeper structures.

Examples of people whose wounds may require ongoing management include those:
- with diabetes;
- with disorders of the immune system;
- who are taking anti-coagulant medication (e.g. aspirin, warfarin);
- who have not received childhood immunisation or a tetanus booster in the last ten years.

Management

The four principles of wound management are:
- control bleeding:
  - pressure (direct and/or indirect) and elevation;
- prevent further contamination:
  - hand washing and drying;
  - wearing gloves;
  - wound cleaning using a no-touch technique;
  - infection control measures;
  - sterile dressings;
- prevent further injury:
  - protect the injured area;
  - stabilise with a sling or a splint if applicable and available;
- promote wound healing:
  - provide appropriate advice on wound care;
  - refer casualty to further medical aid if required.

Hand washing

Before examining a wound, hands should be thoroughly washed and dried to prevent contamination of the wound. Gloves should be worn. Following examination or dressing of a wound, gloves should be discarded into general waste and hands should be washed and dried again to prevent potential contamination of yourself or another person.

Cleaning of wounds

Thorough cleaning of the wound is important to promote wound healing. The aim of wound cleaning is to remove contaminants from the wound without damaging underlying tissue.
Despite the number of antiseptics available for wound cleaning, the most cost effective and safe solution to use is normal saline. Normal saline will not cause damage to sensitive tissue, is readily available in pre-packed ampoules or sachets and has a longer shelf life than most proprietary antiseptics.

Wounds are best cleaned by using a steady stream of saline solution directly from the ampoule or package. Wounds should be cleaned and dried using sterile gauze direct from its package. Cotton wool should be avoided as the cotton fibres may adhere to the wound or serous surfaces and delay wound healing.

The use of metal forceps, kidney dishes or gallipots is discouraged as all these implements are a potential harbour for micro-organisms.

Dressing of wounds

A number of different dressings are available for wound care (*A.F.A* .,1998, pp. 72-73). The choice of dressing used will be dependent on an accurate assessment of the wound and the need for referral to ongoing medical care.

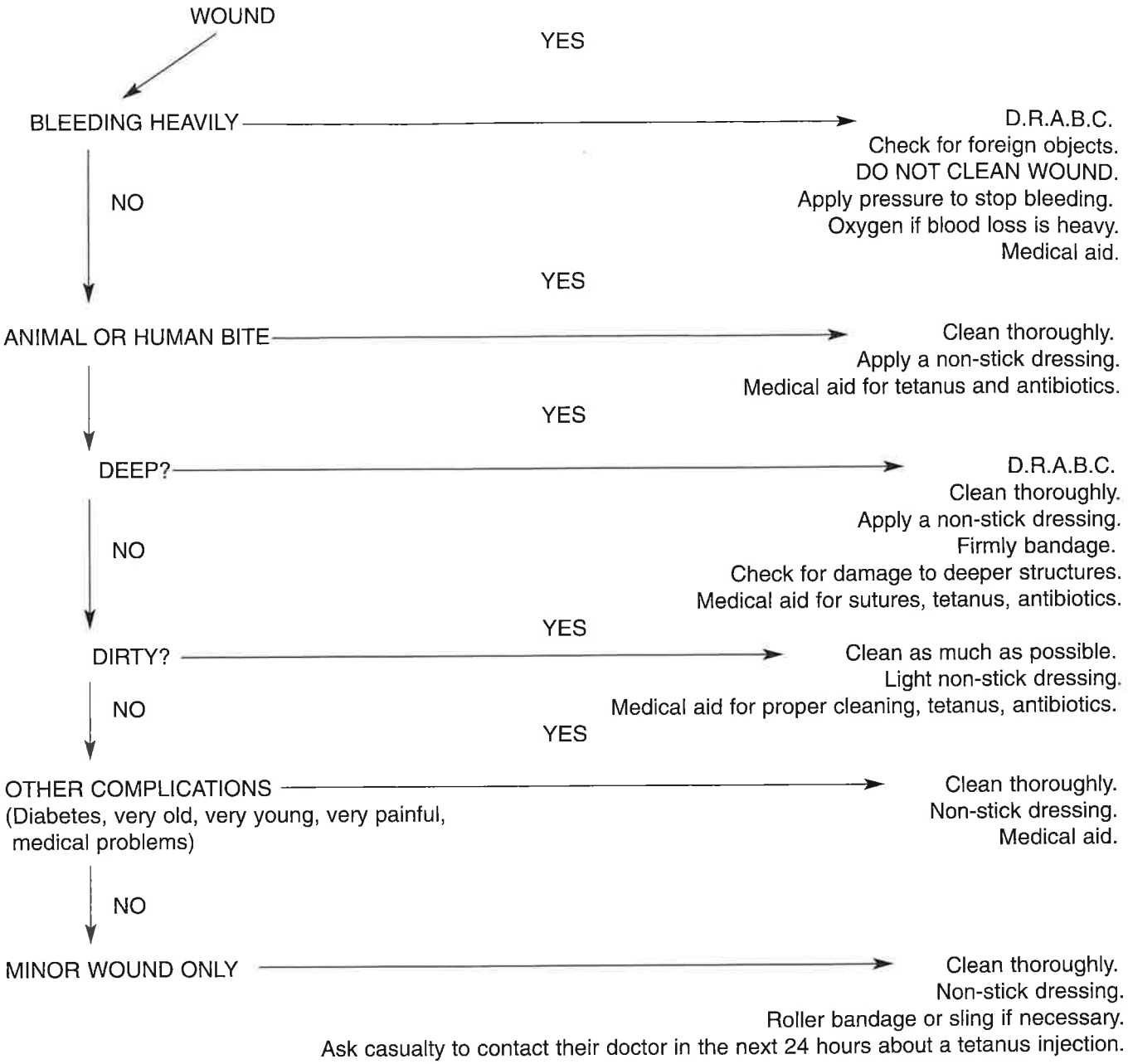
Most wounds encountered in the first aid setting require a simple dressing. These dressings are prepackaged and sterile and have an absorbent pad surrounded by an adhesive material. Caution must be taken with those casualties **who have allergies to some types of wound dressing or adhesive tape.**

Larger or more complex wounds may require larger dressings, pads and bandages to provide compression. It is preferable that casualties who are to be referred for immediate ongoing medical attention have their wounds covered with a non-stick dressing or a saline soaked dressing. Apply compression and elevation if required. The correct application and removal of a non-stick dressing will prevent further damage to the underlying tissue and the potential for re-bleeding.

Re-dressing of wounds

Members may occasionally be asked to re-dress an existing wound whilst on a first aid duty. Prior to doing this, you should question the casualty to determine what care has already been given. If the wound is clean and dry and the casualty is being looked after by a health care professional, refer the casualty back to the carer. However, if the dressing is obviously dirty, loose, restricting circulation or wet then you may need to manage it using a no-touch technique. Should the old dressing adhere to the wound, irrigate thoroughly with normal saline to wet the dressing and soften it so that it is loose enough for safe removal. Accurate documentation of findings and first aid management should be given to the casualty on a completed OB12 form.

WOUND CARE SUMMARY



Note: Completion of an OB12 Casualty Report form is required for all wound care.

Wound Infections

With all wounds there is the potential that they may become infected and the casualty should be alerted to this. Should any sign of infection occur the casualty should seek immediate medical aid. Some of the signs and symptoms which indicate a wound is infected are:

- redness around the wound;
- swelling and tenderness of the wound;
- an increase in pain;
- the wound feeling hot;
- pus discharging from the wound;
- offensive odour from the wound;
- a red line travelling up from the wound;
- an increase in body temperature to above 37.5°;
- an increase in pulse rate;
- general malaise.

4.1 Manage a casualty with a minor wound using contents of a basic first aid kit

Checklist	Needs Improvement Date	Proficient Date
D.R.A.B.C. Undertake Basic Life Support, including immediate control of severe bleeding as per A.F.A., pp. 93-101.		
Casualty Care Ensure privacy if possible. Reassure casualty. Sit casualty down (lie down if pale or feeling unwell). Take a history of injury. Check for alert bracelet, e.g. Medic Alert. Explain what you are going to do.		
Wound Examination Wash and dry hands. Put on gloves. Look at wound. Note: - type; - position; - size. Check for foreign objects in wound. If bleeding profusely, apply direct pressure to the wound. Position injured part comfortably. Remove jewellery from limb if necessary and give to the casualty or family. Document this on the OB12 form. If unable to remove jewellery, observe limb or fingers for changes in circulation and document. Protect casualty's clothes.		
Equipment Collect equipment needed: - gauze swabs; - cleaning solution; - dressing tape; - bandage; - scissors; - rubbish disposal receptacle.		
Procedure Wash and dry hands. Put on gloves. Remove covering dressing (if applicable). Use a non-touch technique. Use the inside of the gauze pack as a sterile field. Pick up each swab by the back. The surface of the gauze swab or dressing which comes in contact with a wound must not be touched.		

Checklist	Needs Improvement Date	Proficient Date
Clean wound using: - normal saline; - water (sterile if available); or - rinse under a tap. Clean wound thoroughly. Ensure a steady stream of saline solution across all surfaces of the wound. Clean surrounding skin surface. Dry with gauze. Apply suitable dressing that extends at least 2.5 cm beyond the wound edges. Apply padding if wound is likely to weep. Fix dressing securely in position (check for casualty allergies) with: - adhesive tape; - bandage. Immobilise limb if necessary. Check circulation below the wound. Check the casualty is comfortable. Correctly dispose of used swabs, equipment etc. Remove gloves and dispose of in general waste receptacle. Wash and dry hands.		
Discharge Fill out OB12. Provide and record ongoing advice.		

Recommended Immunisation Table

IMMUNISATION SCHEDULE (NSW HEALTH)

Babies born BEFORE 1 MAY 2000

AGE	ANTIGEN	VACCINE
2 months	DTPa Hib Polio	Infanrix HibTITER/PedvaxHIB* OPV
4 months	DTPa Hib Polio	Infanrix HibTITER/PedvaxHIB* OPV
6 months	DTPa Hib Polio	Infanrix HibTITER OPV
12 months	MMR Hib	Priorix PedvaxHIB*
18 months	DTPa Hib	Infanrix HibTITER
4 years	DTPa MMR Polio	Infanrix Priorix OPV
10 years 1 month later 5 months after 2nd dose	Hep B (1st dose) Hep B (2nd dose) Hep B (3rd dose)	H-B-Vax II
15-19 years	ADT Polio	ADT OPV

Babies born ON OR AFTER 1 MAY 2000

AGE	ANTIGEN	VACCINE
2 months Birth (maternity units)	DTPa Hep B	Infanrix H-B-Vax II
2 months	DTPa-hepB Hib Polio	Infanrix - HepB Pedvax HIB OPV
4 months	DTPa - hepB Hib Polio	Infanrix - HepB PedvaxHIB OPV
6 months	DTPa-HepB Polio	Infanrix - HepB OPV
12 months	MMR Hib	Priorix PedvaxHIB
18 months	DTPa	Infanrix
4 years	DTPa MMR Polio	Infanrix Priorix OPV
15-19 years	ADT Polio	ADT

Bandaging

REFERENCE: St John Ambulance Australia, 1998, Australian First Aid, Third edition, pp. 75-79.

OBJECTIVES: On successfully completing the module, the member will be able to:

5.1 state the two types of bandages and when they are used;
5.2 state the rules of bandaging;
5.3 state the signs and symptoms of a bandage being too tight;
5.4 demonstrate how to check circulation;
5.5 demonstrate the application of:
- triangular bandage to the knee;
- simple spiral bandage to the forearm;
- figure of eight bandage to the forearm;
- figure of eight bandage to the ankle.

1. **Definition:** A bandage may be referred to as a roll or strip of gauze or other material used to bind or wrap a part of the body.

2. **Bandages are used to:**
- keep dressings in position;
- keep splints in position;
- provide support;
- control haemorrhage;
- restrict movement;
- correct deformity;
- prevent or reduce swelling.

3. **Triangular Bandages**

Triangular bandages are made from a one-metre square piece of cloth cut diagonally into two triangular sections. Triangular bandages can be used for padding, slings, pads and dressings and, if too large, can be folded in half. When a roller bandage is not available, a triangular bandage may be used to secure a dressing or for padding at the knee or elbow. A triangular bandage is secured using a reef knot.

4. **Roller Bandages**

Roller bandages are made from many types of materials. Select the type that is suitable for the injury you are treating, e.g.:

- conforming gauze:	light weight and stretch;
- light weight crepe:	gives some pressure;
- medium to heavy weight crepe:	gives better support;
- elastic:	gives firm pressure.

5. **Size of bandages:**

- fingers:	2.5 cms;
- head:	5 cms;
- arms:	5 to 7.5 cms;
- legs:	7.5 to 10 cms;
- trunk:	10 to 15 cms.

6. Rules of bandaging:

- Sit casualty down.
- Select correct type of bandage.
- Stand in front of the casualty.
  Support limb in required position, e.g. elbow may be bent.
- Pad where any two skin surfaces touch.

Specifically for roller bandages:

- Select the correct width of bandage.
- Hold head of bandage uppermost.
- Secure bandage with a fixing turn.
- Bandage from within outwards and from below above, over the front of the limb.
- Cover two thirds of each preceding turn.
- Continue bandaging till you have covered the required area.
- Finish off with a fixing turn.
- End on outside of limb and secure with tape, clip provided or tuck in.

7. Checking circulation

When a bandage, splint or sling has been applied, the circulation must be assessed on a regular basis to ensure the presence of an adequate supply of blood to the affected limb. This is particularly relevant where swelling is present as it can make the bandage tighter.

Signs and symptoms of a bandage being too tight:

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

How to check circulation

Check:

- skin colour and temperature
- for circulation in fingers or toes.

Procedure: Press fingernail or toenail until it turns white, then release - if colour returns within 2 seconds, blood flow is not restricted.

If circulation is impaired, the bandage must be loosened.

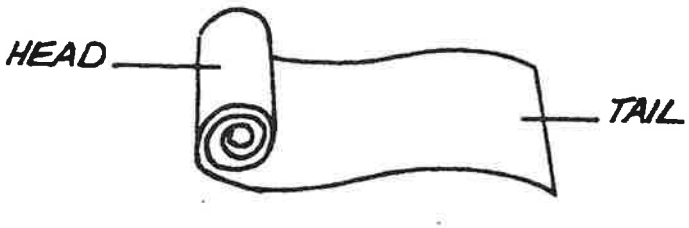
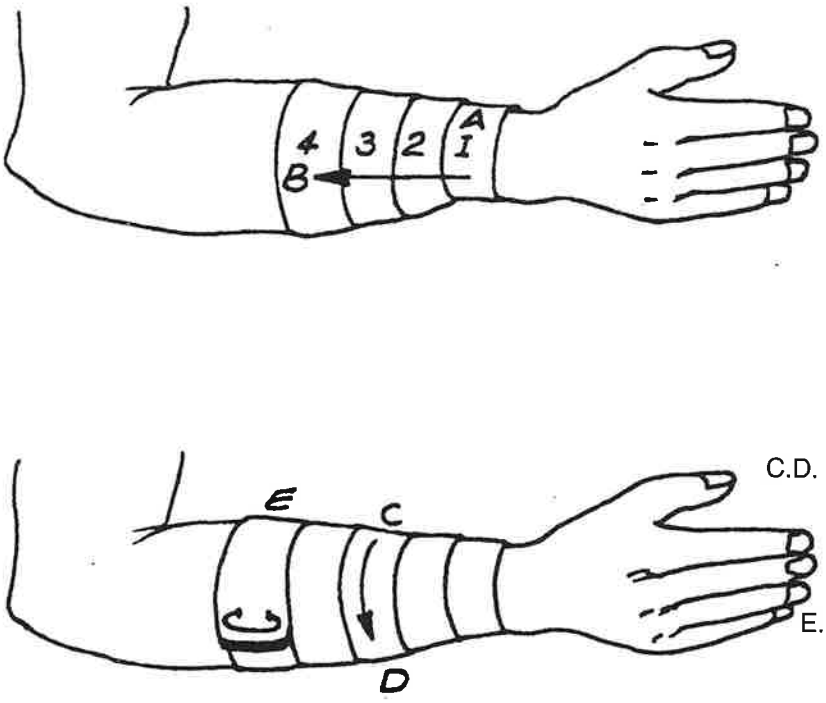


Fig. 1. Parts of bandage



A. Start with fixing turn.

B. Bandage from below to above.

C.D. Bandage from within out.

E. End with a fixing turn and secure.

Fig. 2. Applying a spiral bandage

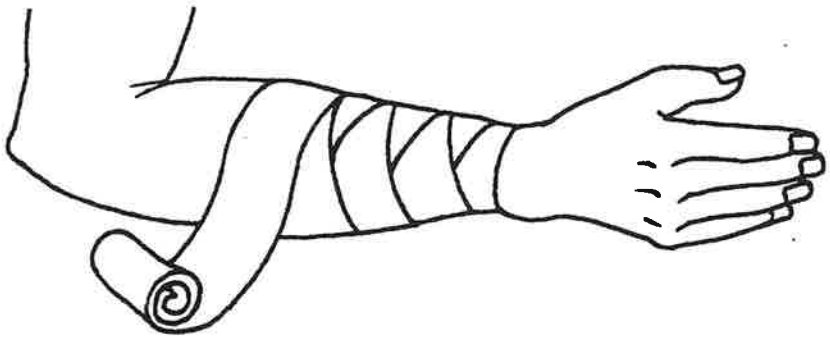


Fig. 3. Figure of eight bandage

5.1 Apply a triangular bandage to the knee

Checklist	Needs Improvement Date	Proficient Date
Explain to the casualty what you are going to do. Check position of casualty. Check position of limb.		
Procedure: - Fold a narrow hem across base of bandage. - Place the centre of the base on leg below kneecap with point towards top of leg. - Take bandage ends around leg, cross over at back of knee and bring to front. - Tie above kneecap, using a reef knot. - Fold the rest of bandage down and secure with tape or tuck in. - Check circulation and adjust bandage, if necessary.		
Ask casualty if the bandage is comfortable.		

5.2 Apply a simple spiral bandage to the forearm

Checklist	Needs Improvement Date	Proficient Date
Explain to the casualty what you are going to do. Check position of casualty. Check position of limb. Check correct size of bandage.		
Procedure: - Place 'tail' end of bandage below the wound, keeping roll of bandage uppermost. - Make one full turn (fixing turn) over the forearm to hold tail in place. - Bandage along forearm in a spiral fashion, each turn of the bandage covering two-thirds of the one before. - Fasten the end with adhesive tape; use clip provided or tuck in. - Check circulation and adjust bandage, if necessary.		
Ask the casualty if the bandage is comfortable.		

5.3 Apply a figure of eight bandage to the forearm

Checklist	Needs Improvement Date	Proficient Date
Explain to the casualty what you are going to do. Check position of casualty. Check position of limb. Check correct size of bandage.		
Procedure: - Place 'tail' end of bandage below the wound, keeping roll of bandage uppermost. - Make one full turn (fixing turn) over the forearm to hold tail in place. - Bandage along forearm using a figure of eight pattern. - Fasten the end with adhesive tape; use clip provided or tuck in. - Check circulation and adjust bandage, if necessary.		
Ask the casualty if the bandage is comfortable.		

5.4 Apply a figure of eight bandage to the ankle

Checklist	Needs Improvement Date	Proficient Date
Explain to the casualty what you are going to do. Check position of casualty. Check position of limb. Check correct size of bandage.		
Procedure: - Secure the 'tail' of the bandage with one turn (fixing turn) around ankle. - Bring the next turn in diagonally from ankle to toe. - Take bandage across sole of foot to ankle. - Continue to use a figure of eight pattern to cover foot (toes exposed). - Make final turn around ankle and secure with adhesive tape or tuck it in. - Check circulation to ensure bandage is not too tight.		
Ask the casualty if the bandage is comfortable.		

Infection Control

REFERENCES:

Lorimer, P.W. & Bridgewater, F.H.G., 1996, *Infection Control Guidelines*, St John Ambulance Australia SA Inc.
National Health and Medical Research Council, Australian National Council on Aids, 1996, *Infection Control in the Health Care Setting. Guidelines for the prevention of transmission of infectious diseases*, Canberra, A.G.P.S.
South Australian Health Commission, 1992, *Guidelines for Infection Control in Health Care Establishments*, Adelaide, South Australian Health Commission.
St John Ambulance Australia, 1998, *Australian First Aid,* Third edition.

OBJECTIVES:

On successfully completing the module, the member will be able to:

6.1 describe Infection Control;
6.2 explain individual responsibilities in relation to Infection Control;
6.3 define Standard and Additional Precautions;
6.4 describe protective attire;
6.5 demonstrate a routine hand wash;
6.6 describe the management of blood and body substance spills;
6.7 state what is his/her responsibility following exposure to blood (or body fluids contaminated with blood) or needle-stick/'sharps' injury.

Introduction

Each member of the Operations Branch has a responsibility to deliver a high standard of first aid to casualties in a safe environment.

A comprehensive and effective infection control strategy is based on the prevention of disease transmission among first aiders, casualties and other potential sources of infection.

The safe handling and management of body fluids by the first aider is imperative in preventing transmission of infection and ensures the safety of both the Operations Branch member and the casualty.

Definition

Infection Control can be defined as the use of strategies and procedures to prevent or minimise the spread of infection.

Principles of Disease Transmission

Spread of infection - three elements:

1. source of the infecting organism;
2. susceptible host;
3. means by which the organism can be transmitted.

1. The **source of the infecting organism** may be:
- a casualty;
- a first aider;
- a bystander;
- equipment or stores used on the casualty;
- the environment.

2. Susceptible host

Infection may pass through a body's outer defence mechanisms:

- the person's body may be able to fight the infection before it establishes itself and starts to multiply, or;
- the infection may take hold but the immune system is able to manage it and the person remains well with no obvious signs or symptoms (asymptomatic) or;
- the person's immune system is not effective enough to prevent the person from suffering from the infection (symptomatic); the body's immune system will react to fight the infection and may or may not be successful in destroying the infection.

Factors that increase a person's susceptibility to an infection:

- age (very old or very young);
- chronic debilitating disease;
- immuno-suppression (drugs or disease);
- shock;
- coma;
- trauma;
- invasive therapeutic and diagnostic procedures;
- the presence of implanted devices or foreign objects;

3. Means of transmission for the organism

The four main routes of transmission are:

(a) Contact transmission:

- direct contact - involves personal contact between a susceptible host and an infected or colonised person;
- indirect contact - involves personal contact of the susceptible host with a contaminated item such as bed linen, clothing, instruments or dressings;
- droplet contact - infectious agent comes into contact with the nose, mouth or eyes of a susceptible person as a result of talking, sneezing or coughing by an infected person.

(b) Diseases transmitted through contaminated items which include:

- ingested (swallowed) - contaminated food, fluid or medications;
- injected - unsterile/contaminated equipment;
- infected - blood or body fluids through broken skin or mucous membrane.

(c) Airborne transmission (inhaled): diseases transmitted by droplets or dust particles in the air carrying the organism. Diseases transmitted by this mode include:

- tuberculosis;
- chicken pox;
- measles;
- rubella;
- diphtheria;
- mumps.

(d) Vector borne transmission: diseases transmitted by insects including mosquitoes (National Health and Medical Research Council, 1996).

The National Health and Medical Research Council (1996) recommends a two-tiered system of precautions based on the way a disease is transmitted. The two tiers are termed:

- Standard Precautions;
- Additional Precautions.

Standard Precautions are basic work practices that are essential to a comprehensive infection control programme:

- personal hygiene practices that include careful washing and drying of hands before and after casualty contact;
- use of protective barriers that may include gloves, eyewear, masks and plastic aprons;
- suitable handling and disposal of 'sharps' and other infectious or contaminated waste;
- use of aseptic/no touch techniques.

Additional Precautions are used for patients **known or suspected** to be infected or colonised with epidemiologically important or highly transmissible pathogens that can cause infection.

Members of the Operations Branch have a responsibility to comply with safety standards and procedures of the St John organisation and **to adopt safe work practices to minimise or prevent diseases transmitted through broken skin or mucous membrane as the result of infected blood or body fluids.** Infections possibly transmitted through broken skin or mucous membrane include blood-borne infectious agents, such as HIV/AIDS, Hepatitis B and Hepatitis C.

Body fluids potentially acting as a vehicle for transmission are:
- blood;
- sputum;
- vomit;
- faeces;
- urine;
- airway secretions.

The member will use protective attire and work practices to minimise exposure to blood and body fluids.

Protective Attire

Personal protective attire provides a barrier between the source of the infecting organism and the first aider and includes:
- gloves;
- eyewear;
- masks;
- plastic aprons.

They protect the wearer's hands, face and clothing from contamination. Their use is not intended to replace the need for safe methods of practice nor the need for routine measures such as hand washing. The appropriate protective attire should be put on before performing a procedure or task.

Because of the unpredictable nature of exposure during emergency situations and resuscitation procedures, the use of protective wear will be at the discretion of the individual member but should almost certainly include gloves.

Gloves

Gloves provide a barrier preventing the wearer from possible exposure to microorganisms and protect the casualty from organisms on the hands of the member. Gloves should be worn when there:
- is casualty contact;
- is likely contact with blood, non-intact skin, wounds or mucous membranes;
- is an aseptic procedure to be undertaken (if sterile gloves not available, ensure the technique used is no touch or minimum touch);
- are emergency resuscitation procedures;
- are casualty suctioning procedures;
- is disposal of blood or body fluids;
- is general purpose cleaning to be done.

Members should wash their hands between casualty contact and after gloves are removed. **Gloves that have been used for casualty management must be discarded before handling pens, notepaper or other similar resources.**

Sensitivity

Gloves are made of a variety of materials. The most commonly used is latex ('natural rubber latex' or NRL). Some people react to latex. The reactions vary from a minor skin change to a life threatening anaphylactic reaction and members should be aware of these possibilities. Nitrile gloves are a good alternative (Technical Advisory Committee, 1995).

Hand care

Healthy, intact skin will resist the invasion by infectious agents, even if the hands become contaminated with blood or body fluids. Moisturising creams should be used regularly, at breaks and on completion of a duty, to avoid dry and cracked skin on the hands.

Members who have any skin problem, such as ulcers or moist weeping areas, which may be a risk, should seek medical advice to discuss changes in their role within the organisation until the condition resolves.

Before beginning daily activities, members should ensure any cuts or abrasions on their own hands are covered by a water-resistant occlusive dressing (e.g. Opsite or Tegaderm) (South Australian Health Commission, 1992).

Face protection

Protective eyewear and mask are to be worn to protect the wearer's face and mucous membranes from contamination with blood splash or spray. Face protection must be worn in those situations where there is a likelihood of splash or spray, e.g. facial injuries, using suction devices and emptying vessels containing blood or body fluids (South Australian Health Commission, 1992).

Protective eyewear (Standards Australia AS 1337-1992):
- must be optically clear, anti-fog and distortion free;
- must be close fitting and should be shielded at the side;
- may be either reusable after cleaning and disinfection or single use.

Masks:
- must be worn and fitted according to the manufacturer's instruction;
- must not be touched by hand while being worn;
- must be removed as soon as practicable after they become moist or visibly soiled;
- must be removed by touching the strings and loops only;
- must be removed and discarded as soon as practicable after use (National Health and Research Council, 1996).

Plastic aprons

These are worn to protect the wearer's clothing and skin from contamination when the risk of contamination is high from blood and body fluids. High-risk situations include major haemorrhages, burns, incontinence and the disposal of vessels containing blood and body fluids.

Work practices

Operations Branch members must examine each task to identify any practice or situation that has the potential for blood or body fluid exposure. Standard operating procedures should minimise the risk of exposure when caring for a casualty.

In general, tasks associated with risk of exposure are those in which there is potential for **skin injury** or **blood spill, splash or spray.** These include invasive procedures, suction manoeuvres, emergency resuscitation and the disposal of blood or body fluids.

Work practices that minimise skin injury

Extreme care and attention are required when handling needles and sharp instruments. Members, having used a 'sharp' in the treatment of a casualty, should take responsibility for the safe containment of the 'sharp' at the point of use by placing it into a yellow coloured puncture-resistant container, specially designed for this purpose.

To prevent needle-stick injury, needles should not be re-capped, bent or broken by hand. Needles **should no**t be removed from disposable syringes or otherwise manipulated by hand.

Work practices that minimise spill, splash or spray

Always empty blood or body fluid contents with care and as close as is practicable to the outlet or disposal point. When cleaning used instruments, always immerse them below the water line to reduce the risk of splash. Deep sinks facilitate total immersion. When carrying out procedures where there is a potential for spray, e.g. using a suction device, correct positioning of the casualty may be sufficient to prevent exposure.

Management of spills

Standard Precautions and the use of protective clothing are important prerequisites in dealing with blood and body substance spills.

In casualty care areas (including medical centres, casualty rooms, caravans, and mobile first aid units), blood and body substance contamination should be dealt with immediately. Small spots or drops of blood or body fluids can be removed immediately by wiping the area with a damp cloth, tissue or paper towelling. A disposable alcohol wipe can also be used.

Small volume spills can be managed easily by wiping the area immediately with paper towelling and then cleaning the area with water and detergent. Where there is a possibility of bare skin contact with the surface, e.g. on a stretcher, the area should be disinfected with a suitable disinfectant such as sodium hypochlorite solution containing 1,000 ppm available chlorine.

Large blood spills should be decontaminated and the area of the spill contained. In these circumstances, and for the protection of members involved in the removal of a large spill, a sodium hypochlorite (a I in 10 solution gives 10,000 ppm available chlorine) may be used but a volume of solution ten times that of the spill is recommended. (A granular preparation, which also prevents spread of the spilt material and ensures a satisfactory concentration of chlorine, may be preferred. It should be left applied for ten minutes. A scraper and pan should be used to remove the absorbed material.) (Refer to the Infection Control Guidelines, Section 7.2.5.2).

After large spills, the area should then be cleaned with a mop and bucket of water and detergent. The bucket and mop should be thoroughly cleaned after use and stored dry. If contact with bare skin is likely, the area should be again disinfected with sodium hypochlorite (1,000 ppm available chlorine) (National Health and Medical Research Council, 1996).

Warning: Care should be taken when handling bleach as it can affect clothing and some surfaces.

Management of exposure to blood or body fluids contaminated with blood and needle-stick or 'sharps' injuries

If a member is exposed to blood (including body fluids contaminated with blood) or has a needle-stick injury, he/she should adopt the Safety First Aid RED protocol:

- **Safety** - needle, body fluid or blood considered to be the infecting agent should be safely contained;
- **First aid** - appropriate measures should be implemented, e.g. washing of skin with soap and water, encouraging the wound to bleed;
- **Reporting** - report the incident to the Officer-in-Charge;
- **Evaluation and risk management** - the member must be examined and risk assessed by a medical officer or trained health care worker;
- **Documentation** - the member will document the incident.

Practical Skills

6.1 Manage spills

Through the adoption of Infection Control principles and Standard Precautions, the member can demonstrate responsibilities in the management of blood or body substance spills.

This skill can be completed by an individual member or as a group skill.

Checklist	Needs Improvement Date	Proficien Date
Danger The area of the spill is contained and movement through the area is restricted (red witches hats can be used for this purpose). Blood and body substance contamination is dealt with immediately.		
Management The member determines the circumstances of the spill including: - the nature of the spill (e.g. sputum, vomit, faeces, urine or blood); - the size of the spill (e.g. spot, small or large spill); - the type of surface (e.g. carpet or impervious flooring); - the area involved (i.e. patient care area or public area); - whether or not there is a likelihood of bare skin contact with the soiled surface.		
Irrespective of the size of the spill, the member adopts Standard Precautions and use of protective clothing that may include: - disposable gloves; - protective eyewear; - mask; - plastic apron.		
The member utilises a disposable 'spills kit' consisting of a large (10 litre) reusable plastic container or bucket with a fitted lid, containing: - a five litre impervious container (treated cardboard or plastic) with fitted lid for waste material; - large (10 litre) zip seal plastic bag for waste material; - disposable sturdy cardboard scraper and pan; - five granular (e.g. Diversol 500) disinfectant sachets.		
Large blood spill - sodium hypochlorite (granular preparation) ten times that of the spill is used (kitty litter can be used for the demonstration); - applied for ten minutes; - a scraper and pan is used to remove the absorbed material; - the area of the spill is then cleaned with a mop and bucket of water and detergent; - disposal of waste follows local regulations.		
The member undertakes a routine hand wash.		

6.2 Demonstrate a routine hand wash

Checklist	Needs Improvement Date	Proficient Date
All skin surfaces are accessible; rings and watches are removed. Nails are clean, short and unvarnished. Hands are wet thoroughly. A neutral pH soap or skin cleanser is used. Hands are lathered and vigorously rubbed together for at least fifteen seconds with the member paying attention to all areas of both hands, particularly the finger tips, area between fingers, thumbs and wrists. Rinses hands under a moderate stream of water. Dries hands thoroughly (patting) with a paper towel or disposable cloth: - if a cloth towel is used, a fresh towel should be used each time; - if a roller towel is used, a fresh portion of the towel should be used. If elbow operated taps are not being used, the member whilst holding the towel, uses it to turn off the tap (South Australian Health Commission, 1992).		
Optional: Apply Glo-Germ powder or liquid to hands before wetting. When both hands are dried thoroughly, they are then placed under an ultraviolet light and areas that have not been washed adequately are visible as white patches. Glo-Germ powder or liquid may be obtained from Infection Control Departments at local hospitals or from universities that have undergraduate nursing programmes. Product details: Glo-Germ (powder or liquid) PO Box 537, Moab, Utah 84532 (801) 259-6034 Toll Free 1-=800-842-6622 Fax (801) 259-5930.		
The member can state when and what resources are used in an emergency hand wash: when? - lack of time (emergency situations); - resources unavailable (field commitments). what? - alcoholic wipe or alcoholic-chlorhexidine preparation (e.g. Convatec's Hexifoam, Technical Advisory Committee, 1986); - gloves.		

6.3 Manage exposure to blood or body fluids contaminated with blood

Checklist	Needs Improvement Date	Proficient Date
The member is able to state the Safety First Aid RED protocol: - Safety - needle, body fluid or blood considered to be the infecting agent should be safely contained; - First aid - appropriate measures should be implemented, e.g. washing of skin with soap and water, encouraging the wound to bleed; - Reporting - report the incident to the Officer-in-Charge; - Evaluation and risk management - the member must be examined and risk assessed by a medical officer or trained health care worker; - Documentation - the member will document the incident.		

Haemorrhage

REFERENCES: St John Ambulance Australia, *Australian First Aid*,1998, Third edition.
St John Ambulance Australia, 1996, *The Science of First Aid.*

OBJECTIVES: On successfully completing the module, the member will be able to:

7.1 discuss the types of external and internal bleeding;
7.2 state the complications of external and internal bleeding;
7.3 demonstrate management of external and internal bleeding.

Introduction

Blood is the life fluid of the body. Without it, the body would not survive. Its main function is the transport of oxygen and nutrients around the body. It also serves to carry waste away from the tissues, help fight infection and help maintain body temperature and other vital functions.

The average human has around 80 mls of blood for every kilogram of body weight. Most of the blood is made up of a watery substance called plasma. The other main constituents of blood are:

- **Red Blood Cells** (erythrocytes) - these are responsible for transporting oxygen and carbon dioxide around the body. A substance called haemoglobin in each erythrocyte gives blood its red colour.
- **White blood cells** (leukocytes) -these are responsible for fighting infection. There are several varieties of leukocytes each with a specific role.
- **Platelets** - these are responsible for clotting of the blood, by releasing chemicals which initiate the clotting process should a break in a blood vessel occur.

Blood is transported around the body through blood vessels. These vessels are structured according to their individual function.

- **Arteries** transport blood away from the heart. These are thick muscular walled vessels that have the ability to increase and decrease in diameter in response to chemical and nerve signals. Arterial blood is bright red because it contains oxygenated blood. When cut, the blood spurts out in time with the heart rate. The pulmonary artery is the exception. It carries dark, low oxygen blood from the heart to the lungs.
- **Capillaries** are minute vessels where oxygen and nutrients are exchanged with the cells for waste products such as carbon dioxide.
- **Veins** are thin walled vessels that have no muscular control, collapse easily and require external muscle action, such as leg movement, to assist in the flow of blood back to the heart. Blood contained in veins is dark red in colour, indicating its low oxygen content. Blood will flow from damaged veins and will not spurt out. The pulmonary vein carries bright red, oxygen-rich blood from the lungs to the heart.

Loss of blood if not treated quickly can lead to a catastrophic series of events that can quickly become irreversible. In most situations, rapid loss of 30% of the total blood volume will result in shock. The aim of the first aider is to try to arrest any blood loss, identify symptoms that indicate continuing blood loss and provide appropriate treatment. Refer to Module 8.

External Bleeding

Major external bleeding occurs after there is disruption in the skin integrity. This is the result of direct trauma the area. There are several different types of wounds and they can vary in depth. The first aider must be awa that any disruption in the skin integrity has the potential to cause damage to underlying structures such as tendons, muscles and blood vessels. The degree of bleeding is often dependent on the depth and damage to underlying blood vessels.

Types of wounds

Refer to *A.F.A.*, 1998, pp. 96-97, for a description of the different types of wounds and their causes. Also refe Module 3.

Internal Bleeding

Internal bleeding occurs when arteries, veins and capillaries bleed into the cavities or tissues of the body. Internal bleeding can be more serious than external bleeding as it can often not be seen. It may not manifest itself until the casualty has lost a substantial amount of blood and exhibits signs of shock or other symptoms, such as neurological changes as seen in a head injury with concealed bleeding. The first aider must suspect internal bleeding and carefully and frequently monitor the casualty. Record all observations on an OB12 form.

Internal bleeding that is severe can result from injuries caused by blunt force or by penetration of the skin and internal structures by a sharp object. Common causes of blunt injuries include falls, car accidents and assaults. Penetrating injuries are the result of stabbings and shootings. Medical conditions that result in severe internal bleeding include perforation of stomach ulcers, ruptured aneurysms, miscarriage and rupture of an ectopic pregnancy.

Internal bleeding will exhibit some general signs and symptoms such as:
- pain;
- tenderness;
- rigidity of abdominal muscles;
- other signs of blood loss;
- blood in other body fluids, e.g. vomit, faeces, urine.

Internal bleeding may be revealed by the appearance of blood in body fluids.

Source	Symptom/sign
Lungs	Coughing up bright red frothy blood
Stomach	Coffee grounds appearance of vomit due to the mixing with gastric juices It can bright red if coming from the oesophagus
Small Intestines	Black tarry faeces (called malaena)
Large Intestines	Bright red to dark red blood in the faeces
Rectum/Anus	Bright red due to trauma or bleeding polyps/haemorrhoids
Kidneys/Bladder	Urine can be bright red to a smoky colour, depending on the age of the injury.
Uterus/Vagina	Very heavy bright blood, with clots, coming from the vagina can indicate a miscarriage.

Management of Bleeding

General Assessment and Management Principles

Follow the principles of casualty assessment and management.

1. Primary Assessment
- **D**anger;
- **R**esponse;
- **A**irway - clear and open;
- **B**reathing - check and maintain;
- **C**irculation;
- Control major bleeding (on a limb, for example), using direct pressure and elevation.

Secondary Assessment
- Vital signs;
- AMPLE history:
  . **A**llergies;
  . **M**edication currently used;
  . **P**ast illness/**P**regnancy;
  . **L**ast meal;
  . **E**vents/**E**nvironment related to the problem/injury;
- Head to toe examination.

Manage
- Manage shock;
- Make plan of action;
- Treat other injuries in order of priority;
- Arrange for appropriate disposal of casualty.

REMEMBER THE RULE
ASSESS * MANAGE * REASSESS * APPROPRIATE DISPOSAL

General principles in the management of external bleeding

- Put on gloves. Use Standard infection control procedures (see Module 6).
- Direct pressure to bleeding point.
- Elevate the injured area if possible.
- Apply a firm pressure bandage.
- Administer oxygen at 8 litres/minute by a face mask, if there are any signs of shock, e.g. casualty is cool and pulse is greater than 100.
- Rest and reassure casualty.
- Check circulation distal to the injured area to ensure that the circulation is not compromised.
- Check integrity of dressing and effectiveness of bleeding control.
- Do not give anything to eat or drink. If the casualty complains of dry lips and mouth, moisten the lips with a wet cloth.
- Monitor and record vital signs regularly.
- Refer casualty to medical aid if needed.

If severe bleeding from a limb cannot be controlled by direct pressure and elevation, it may be necessary to apply pressure to a pressure point. REMEMBER: Act quickly. (Refer to page 98 of *Australian First Aid.*)

In some situations, such as amputation or where large area of tissue has been lost, a constrictive bandage may have to be used.

Refer to discussion group topics at end of module.

General principles in the management of internal bleeding

- Rest casualty in the most comfortable position.
- Administer oxygen at 8 litres/minute by a face mask if there are any signs of shock, e.g. casualty is cool and pulse is greater than 100.
- Rest and reassure casualty.
- Do not give anything to eat or drink. If the casualty complains of dry lips and mouth, moisten the lips with a wet cloth.
- Monitor and record vital signs including blood pressure regularly.
- Keep any pads or body fluids (urine, faeces, and vomit) for later analysis.
- Refer casualty urgently to medical aid.

7.1 Manage an external haemorrhage

Practical incident

You are called to an incident where a carpenter has cut his left hand with the saw. The wound is bleeding freely.

Checklist	Needs Improvement Date	Proficient Date
Primary Assessment **D**anger On approaching the casualty, observe the scene for dangers: - to yourself; - to others; - to the casualty. Look for clues for possible injuries.		
Response - (Yes); - Speak to the casualty: "Lie/stay still - don't move" (casualty to be kept at rest); "I am a first aider and I can help you"; "My name is ....."; "What is your name?"		
Airway - Visibly check airway (mouth);		
Breathing - (Yes); - Ask the casualty what happened - "Tell me what happened".		
Circulation - Explain to the casualty that you are going to make an examination; - Check for haemorrhage; . remove or cut clothing to expose the wound; . control bleeding by applying pressure directly on the bleeding area; . elevate the left hand of the casualty; . bandage the hand firmly; . check distal circulation;		

Checklist	Needs Improvement Date	Proficient Date
if compromised: - loosen bandaging; - recheck distal circulation; - refer casualty urgently to medical aid; - if bleeding continues, re-site the pressure dressing and check that the bleeding has stopped; - maintain elevation and the limb at rest by placing the left hand in a full arm sling. - Treat for shock (refer to Module 8 on Shock).		
Secondary Assessment - full examination of casualty; - reassure the casualty; - obtain a history of events from the casualty: . **A**llergies; . **M**edications currently used; . **P**ast illnesses/**P**regnancy; . **L**ast meal; . **E**vents/**E**nvironment related to the injury. - check casualty for a Medic Alert bracelet; - exclude other injuries: look, listen and feel, checking for wounds, fractures, etc.; - treat any injury; - refer casualty to medical aid; - check: . pulse; . respiration; . blood pressure; . skin colour. - check level of consciousness: . **A**lert; . **V** Responds to **V**ocal stimuli; . **P** Responds only to **P**ainful stimuli; . **U**nresponsive to all stimuli; - check pupil response and size; - recheck pulse, respirations, blood pressure, level of consciousness, pupils, haemorrhage control and distal circulation every 15 minutes.		
General - complete OB 12 Casualty Report form; - use of Standard Precautions; - reassurance and support of fellow workers; - ambulance handover.		

External Bleeding

Discussion Groups

1. Pressure Points

What are pressure points?

Pressure points are anatomical structures **on limbs** where a major artery lies over or close to a bone. Placing firm digital pressure at specific points of the body compresses the artery against the bony structure resulting in diminished blood flow to the limb.

Where are pressure points located on the body?

Pressure points are located:
- brachial arteries (inner aspect of both upper arms);
- femoral arteries (inner aspect of groin area of both legs).

(Refer to diagram in *A.F.A.*, p.98).

When are pressure points used?

If severe bleeding from a limb cannot be controlled by direct pressure, it may be necessary to apply pressure to the pressure point **immediately above the wound.** When bleeding has been controlled, remove pressure from the pressure point and reapply direct pressure to the wound, i.e. use the pressure point in the groin for a bleeding leg.

If pressure points have been used to control bleeding, the casualty should be referred to medical aid.

General:
- use of Standard Precautions;
- completion of the OB 12 Casualty Report form.

(Refer to *A.F.A.*, p. 98).

2. Constrictive Bandage

What is a constrictive bandage?

A constrictive bandage is a narrow (elastic) bandage that, when applied to a limb **above the elbow or knee,** compresses tissues and other structures against the bone causing constriction. The bandage must be applied so that the first aider can feel no palpable arterial pulse distal to the wound. In amputations, the presence of controlled bleeding following the application of a constrictive bandage would indicate to the first aider that the bandage had been applied effectively.

When is a constrictive bandage used?

A constrictive bandage is used in those situations where bleeding is uncontrolled, irrespective of direct pressure, and where major vessels are involved and there is considerable risk to the well-being of the casualty.

Limb injuries that result in severe haemorrhage include partial amputations, injuries that result from shark attacks and from motorcycle accidents.

Are there any complications in using a constrictive bandage?

If a constrictive bandage is used for a prolonged period of time it can result in necrosis (death) of the tissue below the level of the constriction.

How is a constrictive bandage applied?

- Use a firm cloth approximately 7.5 cms wide and 75 cms long which can be improvised by using clothing or by using a folded triangular bandage.

- Bandage the cloth strip firmly around the injured limb, either between the elbow and shoulder or knee and pelvis, **until a pulse distal to the wound cannot be felt or alternatively when the haemorrhage has been controlled.**
- Note the time of application and write this on a tag that is attached to the casualty.
- Send for an ambulance urgently.
- After 30 minutes, release the bandage and check for bleeding:
  - if there is no bleeding remove the bandage;
  - if bleeding recommences, apply direct pressure to the wound;
  - if this is unsuccessful, reapply the constrictive bandage and recheck every thirty minutes;
  - note the time of removal and/or reapplication and write this on the tag attached to the casualty.
- **the first aider must ensure that the bandage is clearly visible and a written tag is on the casualty. Inform medical aid of the position of the bandage and time of application.**

General:

- use of Standard Precautions;
- completion of the OB 12 Casualty Report form.

(Refer to *A.F.A.*, pp. 100-101).

Shock

REFERENCES: St John Ambulance Australia, 1998, *Australian First Aid*, Third edition.
St John Ambulance Australia, 1996, *The Science of First Aid.*

OBJECTIVES: On successfully completing the module, the member will be able to:

8.1 discuss the types of shock and their causes;
8.2 discuss the management of specific states of shock;
8.3 demonstrate the general management of shock.

Shock is a life-threatening condition. A shocked casualty has an inadequate circulation of blood around the body, with insufficient oxygen reaching vital organs and tissues. Shock can develop slowly or quickly and may cause irreversible damage or death if it is not corrected early.

Causes and Effects

Shock results from the loss of effective circulating blood volume, due to either decreased blood volume or dilation (widening) of the blood vessels, resulting in a decrease in available oxygen to body organs and tissues.

The circulatory system is a closed system with no breaks or gaps. The body regulates this system according to the needs and demands that occur on a continual basis. For example, when a hole occurs somewhere in the system, the body attempts to cope with this problem by contracting blood vessels and moving blood around from non-vital to vital organs. The body can only cope for a certain time before the system will fail. Shock is a dynamic condition that if not treated early can rapidly progress to become fatal.

The body has compensatory mechanisms that try to counteract the effects of shock. These are automatic reflexes and include:-
- increasing the pulse rate;
- increase in the respiratory rate;
- decreasing circulation to the skin ; the skin looks pale and feels cold.

The priority in the management of shock is to treat or remove the cause. A number of factors can make shock more likely. These include:
- very young and very old casualties;
- casualties with pre-existing medical conditions;
- pain;
- extremes in temperatures.

Signs and Symptoms of Shock

Initial symptoms and signs are:
- pale face, fingernails and lips;
- cold, clammy skin;
- usually a weak, rapid pulse;
- rapid breathing;
- faintness or dizziness;
- nausea.

If shock progresses and becomes severe, symptoms and signs will include:
- restlessness;
- thirst;
- extremities become bluish in colour (cyanosis);
- confusion and drowsiness;
- rapid breathing;
- extremely weak, rapid pulse.

Types of Shock

There are different states of shock, related to the cause or origin.

Hypovolaemic shock (low blood volume)

In hypovolaemic shock, there is just not enough fluid circulating through the blood vessels to provide oxygen to the vital organs. Causes are:

- loss of blood from internal or external bleeding;
- loss of fluid direct from the cells as in burns;
- loss of fluid from the gastro-intestinal system as in severe vomiting and diarrhoea;
- loss of body fluid from the kidneys as seen in uncontrolled diabetes where excessive glucose in the blood causes large quantities of dilute urine to be excreted.

Neurogenic shock

Dilation of the blood vessels occurs and therefore the circulating blood volume is not adequate to fill the blood vessels. This results from failure of the nerves to control the diameter of the blood vessels. Gravity then takes over and causes pooling of blood vessels in the lower parts of the body.

For example, ***head injuries and spinal injuries*** can cause a failure of the body to maintain the diameter of the blood vessels. This is due to the nerve pathways being damaged.

Cardiogenic shock (cardiac related)

Cardiogenic shock occurs where there is failure of the heart to pump blood around the body.

Causes of cardiogenic shock include:

- ***Heart attack or myocardial infarction*** where a portion of the heart muscle has been damaged and the pumping ability of the heart is affected.
- ***Abnormalities of the heart rate*** such as bradycardia (slow heart) where the heart is not able to pump enough blood to meet the body's demand or tachycardia (fast heart) where the heart is not able to fill properly due to an increased rate.
- ***Heart failure or congestive cardiac failure*** due to age or disease.
- ***Infections*** of the heart muscle.
- ***Lack of oxygen*** to the heart.
- ***Poisons or certain drugs*** can cause the heart to fail.
- ***Trauma*** to the heart muscle.

Anaphylactic Shock (allergic shock)

This is a condition where the body suffers an overwhelming response to an allergen or cause of the allergic reaction. This may be a known allergen such as:

- medication;
- food;
- insect sting, e.g. bee.

In some cases it can be related to something unknown such as:

- airborne pollutant;
- a new medication;
- laundry powder or fabric softener.

The allergen can enter the body via any route. Most commonly allergic reactions occur following ingestion as in food, medication or through topical exposure such as contact with a chemical.

In most cases, allergies manifest themselves rapidly as painful itchy red rashes or a runny nose and itchy throat, but in some cases they can become life threatening with severe symptoms.

The allergic reaction results because of the release from the body cells of a substance called histamine. Histamine causes the red and itchy rash and in large doses will result in swelling of the tissue, particularly the soft tissues of the upper airway. Increase in mucus production will also occur, particularly in the tissue of the respiratory tract. Histamine will also cause dilation of blood vessels, as happens with neurogenic shock.

The swelling of the lining of the upper airways will cause respiratory distress and can mimic the signs and symptoms of an asthma attack. This is due to the spasm of the bronchioles or smaller airways and an increase in mucous production. In this situation, a wheeze will be present on inspiration, expiration or both.

In these situations urgent medical aid is required. In some cases, particularly where the allergen is known, the casualty may carry medication to counteract the effects of the allergen.

Septic Shock

In severe cases of infection, bacteria can enter the circulation, multiply and release toxins. These toxins are then distributed around the body causing the smaller blood vessels to dilate. This results in a falling blood pressure, subsequent decrease in return of blood to the heart and blood being pumped around the body. The release of toxins and other chemical reactions related to the state of shock also causes the heart to fail.

Treatment of Shock

General Assessment and Management Principles

Follow the principles of casualty assessment and management. (See Module 7)

REMEMBER THE RULE
ASSESS * MANAGE * REASSESS * APPROPRIATE DISPOSAL

General principles in the management of shock

- Adopt infection control principles/practices.
- Control any bleeding.
- Administer oxygen therapy 8 litres/minute via a face mask, if this is approved in your State/Territory.
- Reassure casualty.
- Seek medical aid urgently.
- Raise the casualty's legs above the level of the heart; take care if there is a fracture of the leg.
- Dress any wounds or burns.
- Immobilise any fractures.
- Loosen any tight clothing.
- Maintain body warmth but do not overheat.
- Do not give anything to eat or drink. If the casualty complains of dry lips and mouth, moisten the lips with a wet cloth.
- Monitor and record vital signs regularly.
- Position the casualty appropriately:
  - recovery position if there is the likelihood of vomiting or a decreased conscious state;
  - at rest in the most comfortable position with legs raised if at all possible.

Management of the Specific States of Shock

Whilst it may be difficult for the first aider to differentiate between the different types of shock, particularly cardiogenic and septic shock where there is no blood loss, there are some specific forms of treatment for the other states of shock.

Cardiogenic Shock

- Seek **urgent** medical aid.
- Sit casualty up into position of comfort, usually to assist breathing.
- Administer oxygen therapy at 8 litres/minute via a face mask.
- If the casualty is on any anti-anginal medication and is experiencing chest pain, assist the casualty with the administration of the medication if trained in its use.

Anaphylactic Shock

- Seek **urgent** medical aid.
- Sit casualty up into position of comfort, usually to assist breathing.
- Administer oxygen therapy at 8 litres/minute via a face mask.

- If the casualty has any anti-allergy injection of adrenaline, commonly referred to as an Epi-Pen (CSL), support the casualty with its administration. These injections of adrenaline are usually in the shape of a pen and will automatically inject the medication when the appropriate trigger is released.
- If there is facial and throat swelling, apply ice packs to the affected area.
- If authorised, follow State/Territory protocols and administer a bronchodilator such as salbutamol (Ventolin) via a nebuliser or spacer to help combat the bronchospasm.

Fainting

Fainting is not a form of shock. It may occur when the blood pools in the lower extremities. Causes of fainting include:

. exposure to noxious stimuli such as a horrible sight or smell;
. standing up for an extended period, causing pooling of blood in the lower extremities.

The body uses its compensatory mechanisms to correct this problem. This includes a feeling of dizziness which will make the person sit or lie down. In the worse case scenario, the person will lose consciousness quickly and fall. Consciousness returns once the person is lying flat and blood flow returns to the brain.

EXERCISES

Stage the following scenarios. Assess and manage the situation. Document the management on an OB12 form.

1. A twenty five year old man has fallen from a ladder sustaining a closed fracture of the shaft of the femur. There is gross swelling of the right thigh with shortening of the right leg. He is pale, distressed and complaining of severe pain in the right thigh. This pain is worse on movement.

2. A seventy five year old man presents to the first aid room at a football match in your district. He is complaining of severe central chest pain which radiates to his left arm and up into the left side of his face. He is very short of breath, his skin is pale and clammy.

3. A sixteen year old girl presents to the first aid room at an athletics carnival after being stung by a bee on the right arm approximately 3 minutes ago. On arrival she is already very short of breath with a severe expiratory wheeze. Her friend tells you she is allergic to bees and has an adrenaline pen with her.

8.1 Manage a casualty in shock

Practical incident: The format below refers to Scenario 1 above. The format can be varied to fit the second and third scenarios.

Checklist	Needs Improvement Date	Proficient Date
Primary Assessment **D**anger On approaching the casualty, observe the scene for dangers: - to yourself; - to others; - to the casualty.		
Response - (Yes); - speak to the casualty: "Lie/stay still - don't move" (casualty to be kept at rest); " I am a first aider and I can help you"; "My name is ....."; "What is your name?" - clues for possible injuries.		

Checklist	Needs Improvement Date	Proficient Date
Airway - visibly check airway (mouth); - maintain a clear and open airway;		
Breathing - (Yes); - ask the casualty what happened - "Tell me what happened"; - place the casualty in the recovery position if there is breathing difficulty, if vomiting is likely, or if the casualty becomes unconscious; - administer oxygen therapy via a face mask at 8 litres per minute.		
Circulation - explain to the casualty that you are going examine him; - check for haemorrhage (if appropriate): . remove or cut clothing to expose the wound; . control bleeding by applying direct pressure the wound; . elevate the affected limb (provided there is no fracture); . check distal circulation (refer to the module on external bleeding); - call for further aid or ambulance.		
Secondary Assessment - full examination of casualty; - reassure the casualty; - loosen tight clothing; - place the casualty in the most comfortable position; - obtain a history of events from the casualty: . **A**llergies; . **M**edications currently used; . **P**ast illnesses; . **L**ast meal; . **E**vents/**E**nvironment related to the injury. - check casualty for a medical bracelet; - exclude other injuries: look, listen and feel, checking for wounds, fractures, etc.; - immobilise fracture of right leg, bringing left leg over to the right; - dress any wounds or burns; - maintain body warmth but do not heat casualty; - if the casualty complains of thirst, moisten lip, but do not give anything to eat or drink; - refer casualty to medical aid urgently; - check: . pulse; . respiration; . blood pressure and; . skin colour. - check level of consciousness: . **A**lert; . **V** Responds to **V**ocal stimuli; . **P** Responds only to **P**ainful stimuli; . **U**nresponsive to all stimuli. - check pupil response and size; - recheck pulse, respirations, blood pressure, level of consciousness, pupils, haemorrhage control and distal circulation every 15 minutes.		

Checklist	Needs Improvement Date	Proficient Date
General - complete OB 12 Casualty Report form; - use of Standard Precautions; - reassurance and support of relatives and/or fellow workers; - ambulance handover. Discuss management of other scenarios Review protocols for: . oxygen . anginine; . Ventolin; . Epi-Pen; if these are approved for use in your State/Territory.		

Eye and Dental Injuries

TRAINING OUTCOMES: At the end of this learning session, the member will be able to:

Eye Injuries	**9.1**	show an understanding of the anatomy and function of the eye;
	9.2	discuss the importance of prevention in relation to eye injuries;
	9.3	Outline the first aid treatment for:
		- foreign bodies embedded and loose;
		- trauma: . direct and indirect;
		. penetrating and non-penetrating;
		- burns: . radiation;
		. chemical;
		- smoke in the eyes;
Dental Trauma	**9.4**	understand the importance of dental injuries;
	9.5	outline their first aid treatment including that for dislodged teeth.

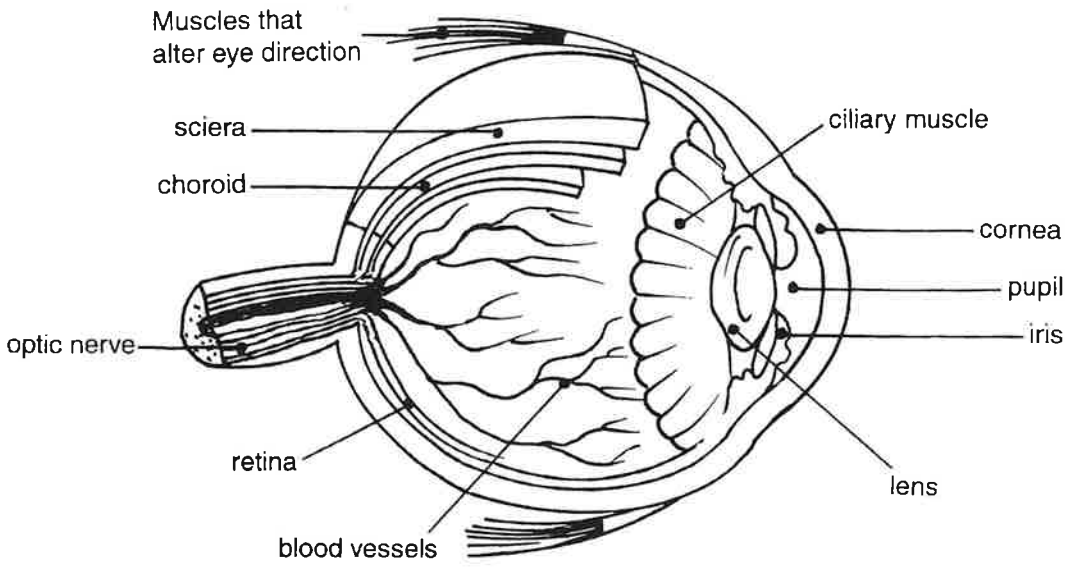
Eye Injuries

Anatomy of injury

The eye is both sensitive to damage and poor at repairing damage. Any damage or suspected damage to the eye must be referred immediately for medical review and care. **First aid is aimed at preventing further damage.**

Light strikes the cornea, a transparent circle of layers of cells at the middle front of the eyeball, through which (as observers) we see the pupil and iris.

Light then passes through the pupil - an empty space surrounded by the circular muscle of the iris to enter the lens. The shape of the lens can be altered by the tension in muscle attached to the edges of the lens so that light is focussed at the back of the lens where it activates nerve cells that pass sensation on to the brain. The eye is filled by a clear jelly-like substance.



Diseases of/injuries to the eye

The cornea can become opaque from infection, burns or severe scarring - it is very sensitive to anything other than minor damage. The iris can be damaged by blunt trauma - with good eyesight you may see blood in front of it, or it may be irregular in shape. The iris normally closes with bright light or drugs like morphine so that the pupils are small. The iris opens with excitement or sometimes drugs, e.g. uppers, to give a big pupil. A pupil that is irregular in shape, e.g. oval, can be caused by trauma and should be referred on; ask if it's an old injury.

The lens can become cloudy with disease, e.g. diabetes, so that vision is lost gradually. It can be disrupted by trauma and give blurred vision.

Acute loss of vision needs immediate referral. It can be caused by bleeding behind the lens, either spontaneous from trauma or from clots in the blood vessels or other medical conditions.

The white of the eye or sclera has a covering - the conjunctiva behind which blood may collect from trauma or even spontaneously, e.g. a sneeze. The casualty should be sent for medical assessment.

A painful eye, especially a red inflamed one, can have medical causes, e.g. glaucoma, as well as being due to trauma.

Prevention of injuries

Behavioural modification, e.g.:
- wearing seat belts that stop windscreen injuries;
- refraining from throwing missiles such as fire crackers.

Protection:
- eye frames for squash;
- welding goggles when near arc welding;
- sunglasses or goggles, especially on snow;
- goggles when in dust or spray painting;
- safety glasses when hammering or grinding metal, or spot welding or using machinery, e.g. mulcher.

Examination of eye injuries

D.R.A.B.C.

D
- It is no good examining an eye with dust in it in the middle of a dust storm; move to shelter.
- Sit or lie the casualty down when examining or treating the eye as the casualty may faint.

R.A.B.C.
- Consider other injuries - eye injury can be very painful and the loss of vision is so devastating that other injuries can be ignored. For example, with cinders, grit and smoke in the eye, there may also have been considerable damage to the airway and lungs by heat/smoke inhalation.

- The traumatic eye injury may be associated with facial injuries such as fractures to the facial bones or a fractured jaw.

Reaction to the injury may make examination difficult especially in children. The eye will usually be red and inflamed and often closed from spasm of the eyelid muscles. Observe any discharge, blood or mucous. If contact lenses are in place, the casualty should be encouraged to take them out if possible unless the injury is severe.

Management of Eye Injuries

General Principles

1. Always take a history:
   - how did it happen?
   - when did it happen?
   - what does it feel like?
   - what can you see out of the affected eye?

2. Follow infection control guidelines. The damaged eye is easily infected. If wearing gloves, wash with sterile water or saline to remove any powder from them before use.
3. As with any other wound, do not remove any embedded object.
4. Do not try to remove anything on the cornea (coloured part of the eye) - as you may very easily damage the cornea.
5. Protect the eyeball from pressure. Pressure on the eyeball is:
   - painful and may cause bleeding or other internal damage to the eye; or
   - cause the heart to slow or stop beating.

   Cover the eye after placing pads above and below to prevent pressure on it.
6. Do not try to examine an eye that is severely damaged.
7. Refer casualty for medical treatment.

With a small foreign object not embedded and not on the cornea, removal can be attempted.

- Take a history.
- First, locate the object. Ask the casualty to look up and pull the lower lid down.
- If not seen, pull the upper lid down over the lower lid which may dislodge the object.
- If the object is seen, it can be removed using the corner of a clean, moist cloth.
- If you cannot find or remove it, wash eye with sterile saline or, if not available, then clean water.
- If the foreign object is not removed, protect the eye to stop casualty rubbing it and refer for medical treatment.

Wounds to the eye (may be penetrating or blunt e.g. glass or fist).

- Take a history.
- Do not repeatedly or forcibly examine the eye (if the injury is severe, do not examine the eye).
- Stop casualty rubbing the eye.
- Protect the eye.
- Ask casualty not to move the eye.
- Refer for medical treatment.

Burns to the eye

- e.g. chemicals from splash or contact i.e. rubbing eye.
- radiation - heat or ultraviolet e.g. flames, arc flash and snow blindness.

The eye is red, inflamed, watering or discharging and painful (especially on movement as if a foreign body is present). This is made worse by light so that the eyes are kept closed as much as possible.

- Take a history.
- For chemical burns:
  . irrigate the eye preferably with sterile saline or cold water;
  . continue during transport so that irrigation occurs for at least 20 minutes;
  . protect the eye;
  . refer for medical treatment.
- For other forms of radiation burns, e.g. arc flash, snow blindness:
  . protect the eye;
  . stop casualty rubbing the eyes;
  . refer for medical treatment.

Smoke in eyes is likely to be a combination of a mild chemical burn and small foreign objects resulting in a red, inflamed and watery eye.

- Take a history.
- Irrigate the eye, preferably with sterile saline or with cold water.
- Stop the casualty from rubbing eyes.
- If there are foreign objects that cannot be removed or the eye is very inflamed and painful, protect the eye.
- Refer for medical treatment.

Lacerations and bruises around the eye.

Blurred or double vision can be caused by a blow that fractures the cheekbone, disturbing the eye socket. Lacerations around the eye can bleed profusely.

- Take a history.
- Apply a dressing without pressure.
- Refer for medical treatment.

To protect the eye:

- Stop the casualty from rubbing the eye.
- Apply pads above and below.
- Bandage gently in place.
- If a large penetrating object is present, try to support it in place with pads or a paper cup; then bandage gently in place.

Summary

In all instances where there is pain, redness, loss of vision, distorted or blurred vision or discharge from the eye, take a history, protect the eye with a sterile pad and send for medical assessment as soon as possible.

Dental Trauma

The major concern of the first aider is any associated injuries. A blow or wound sufficient to dislodge a tooth is sufficient to fracture the jaw or cause severe soft tissue swelling.

D.R.A.B.C.
Always assess the airway.

Take a history.

Examine the mouth:

- Severe soft tissue trauma, e.g. gunshot wound to tongue, is an extreme emergency because of the rapidity with which swelling can occur - call for ambulance.
- If a tooth is missing, seek help to find it.
- Instruct casualty to rinse mouth out or spit out blood and keep tongue away from tooth socket.
- If tooth found, attempt replacement.
- If not, fold a sterile gauze into a pad, fit into socket and instruct casualty to bite firmly on gauze.
- If bleeding from other sites in mouth, if possible apply a sterile gauze pad and instruct casualty to apply pressure or else apply yourself.

Refer for dental/medical treatment.

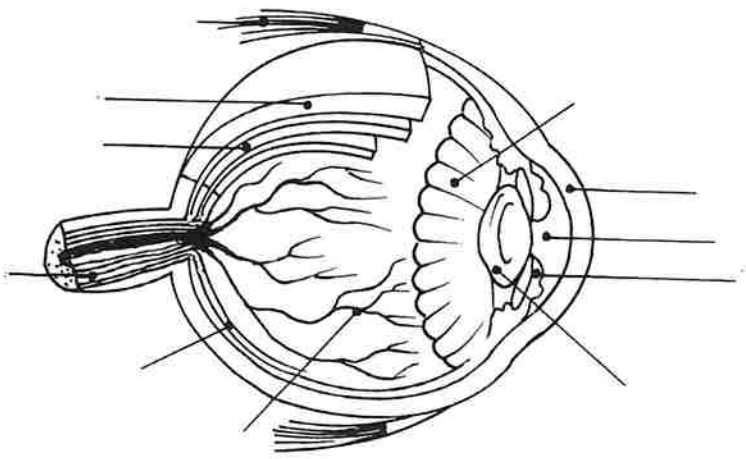
To replace a dislodged tooth:

- Gently clean it with the casualty's saliva or running water.
- Ask if there is a dentist or doctor present.
- If not, put tooth back in socket. N.B. it is possible to replace front teeth facing the wrong way. Have a good look before deciding direction.
- Hold the tooth in place.
- Support it there by moulding aluminium foil over it and on the teeth on either side.
- Have casualty gently bite on foil.

Refer for dental treatment as soon as possible.

Assessment

1. On the diagram below, name the parts of the eye and their functions:



2. The member is to outline the general principles for management of an eye injury.

9.1 Examine for an eye injury

Checklist	Needs Improvement Date	Proficient Date
D.R.A.B.C., sit or lie down. History - how? - when? - what? . sensation; . function. Check for other injuries. Examine the eye: - infection control precaution; - powder washed off gloves; - gentle and non-repetitive. Any treatment. Protect the eye: - stop rubbing; - apply pads; - bandage gently. Refer for medical care.		

3. The member is to outline special problems requiring treatment:
   - burns;
   - large embedded object;
   - smoke;
   - lacerations around the eye;
   - foreign object in the eye.

4. You are called to an incident where a casualty has been assaulted and sustained injuries to the mouth.

9.2 Examine for a dental injury

Checklist	Needs Improvement Date	Proficient Date
D.R.A.B.C.		
History		
Examination Look for other injuries - soft tissue damage tongue; unless minor, refer immediately for medical treatment. If tooth lost, have others search. Stop bleeding: - sterile pad in socket; - sterile pad to bleeding source. Apply pressure: - biting on pad; - finger (yours gloved or casualty's own). Refer for dental/medical treatment.		
There is a dislodged tooth: - clean with saline, water or casualty's saliva; - if present, seek dental or medical help; - assess tooth - replace tooth: . hand; . foil. Casualty to bite gently. Refer for dental care.		

MODULE 10

Respiratory Physiology

Chest injuries - types, fractures, pneumothorax, flail chest

REFERENCE: St John Ambulance Australia, 1998, *Australian First Aid*, Third edition, pp. 269-286.

OBJECTIVES: On successfully completing the module, the member will be able to:

10.1 describe the functional anatomy of the lung;
10.2 state the major organs that are contained within the thoracic cavity;
10.3 describe the types of thoracic trauma;
10.4 state the priorities of management in attending to a casualty with chest injuries;
10.5 demonstrate the management of a casualty with chest (thoracic) injuries.

PRACTICAL SKILLS:

10.1 demonstrate the process of assessment and first aid treatment of a casualty with chest injuries ;
10.2 document history, vital signs, treatment and referral of the casualty to medical aid.

The **LUNGS** are large organs in the thorax cavity comprising:
- a left and right side;
- 300 million tiny air sacs (alveoli) each 1/3 mm in diameter, providing 85 square metres of surface area;
- an air volume capacity of 4 - 5 litres;
- small air passages (bronchioles) joining to form medium and large size bronchi;
- the trachea that lies two thirds in the thorax and one third outside, continuing above to the larynx, pharynx and finally mouth and nose (Fig. 1).

Alongside these sacs lie small blood vessels, termed capillaries, derived from the division of pulmonary arteries. Capillaries unite to become veins.

Gas exchange (i.e. oxygen taken in and carbon dioxide diffusing out) occurs at the surface of the alveolar-capillary membrane that is a fine membrane of one cell width.

The lung is protected by:
- the spinal column;
- ribs and their cartilages;
- the sternum;
- intercostal muscles;
- thick connective tissue;
- the muscular diaphragm separating the abdomen from the thorax (Fig. 2) .

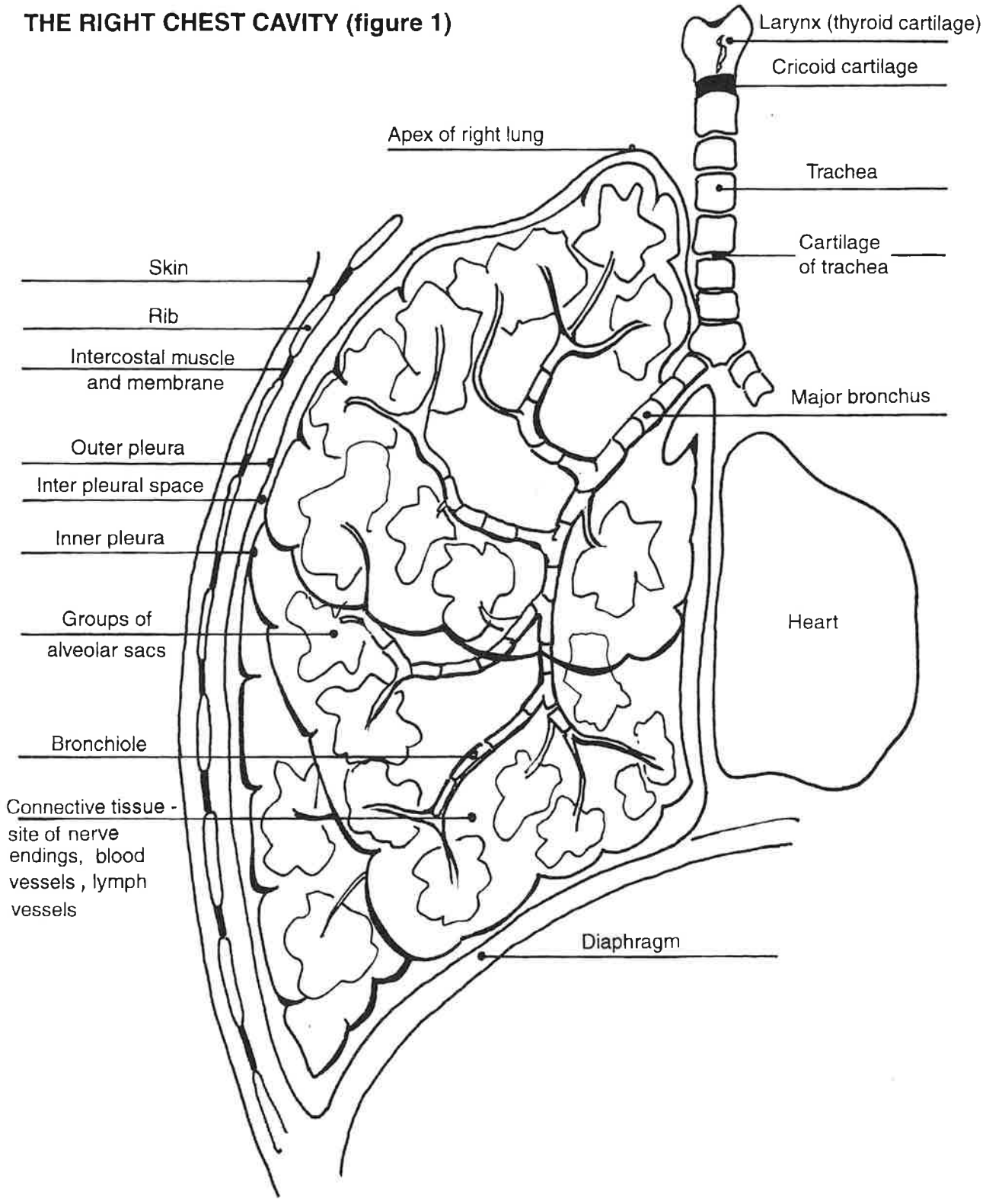
Lung tissue consists of countless blood vessels, nerve fibres, and lymph vessels.

The pleural space is considered a potential space since under normal circumstances it is so small. Trauma caused by a penetrating wound to the wall of the chest or by fractured ribs can puncture the pleural membrane compromising the physiological process and mechanism of breathing.

Group or individual activity:

Discuss the functions of the lungs.

THE RIGHT CHEST CAVITY (figure 1)



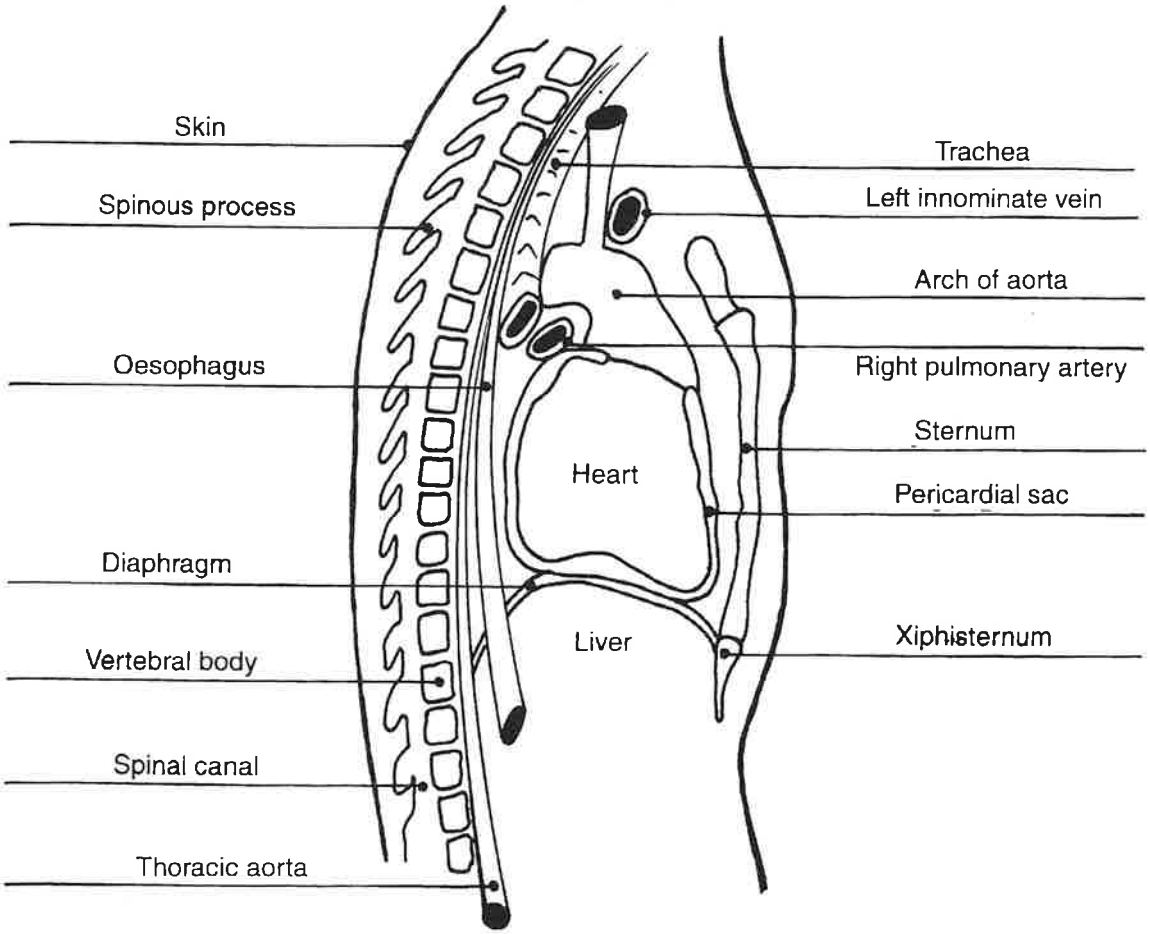
Functions of the lung include:

- metabolism of some chemical compounds, both normal physiological compounds and drugs;
- filtering out particulate and toxic materials, e.g. dust, smog;
- reservoir for blood;
- immune and defence responses;
- producing mucus and antibodies to remove and neutralise foreign proteins;
- elimination reflexes such as coughing and sneezing.

Group or individual activity:

Discuss the other major organs contained in the chest cavity.

THORACIC CAVITY - Lateral view (figure 2)



The **THORAX** contains other important structures that include:
- heart and sac (pericardium);
- major blood vessels, i.e. vena cavae, aorta and branches;
- oesophagus (gullet);
- large nerve trunks, e.g. vagus nerve, sympathetic trunk;
- spinal nerve roots;
- lymph vessels and lymphatic trunks (Fig. 2).

Severity and extent of thoracic injuries are dependent on:
- speed of impact, i.e. low or high velocity;
- site of impact;
- nature of impact, i.e. sharp, blunt;
- surface area of the impacting surface, i.e. large or small.

The **most common scenarios** for such injuries include:
- motor vehicle/cycle accidents (e.g. steering wheel impact);
- falls;
- assaults (including stabbing and gunshot injuries);
- work accidents (crushing by heavy objects).

Assessment of a chest injury

In the conscious casualty, history of events, mechanism of injury, pain in the chest area and difficulty in breathing are determinants that are suggestive of chest injury and require the first aider to undertake a full examination of the casualty including:
- exposing the chest area after ensuring privacy of the casualty;
- looking for signs of broken ribs, local tenderness or presence of wound/s; looking for bruises, deformity, blood and paradoxical respirations.

Group or individual activity: Define the term 'paradoxical respirations'. Refer to the answer at the end of the text.

Superficial injuries to the chest

Minor trauma may result in superficial chest wall cuts, lacerations and contusions anywhere on the body. Treatment for these injuries includes:
- cleaning the wound/s with normal saline;
- use of sterile dressings;
- ice pack to bruises;
- and, if necessary, referral of the casualty to medical aid.

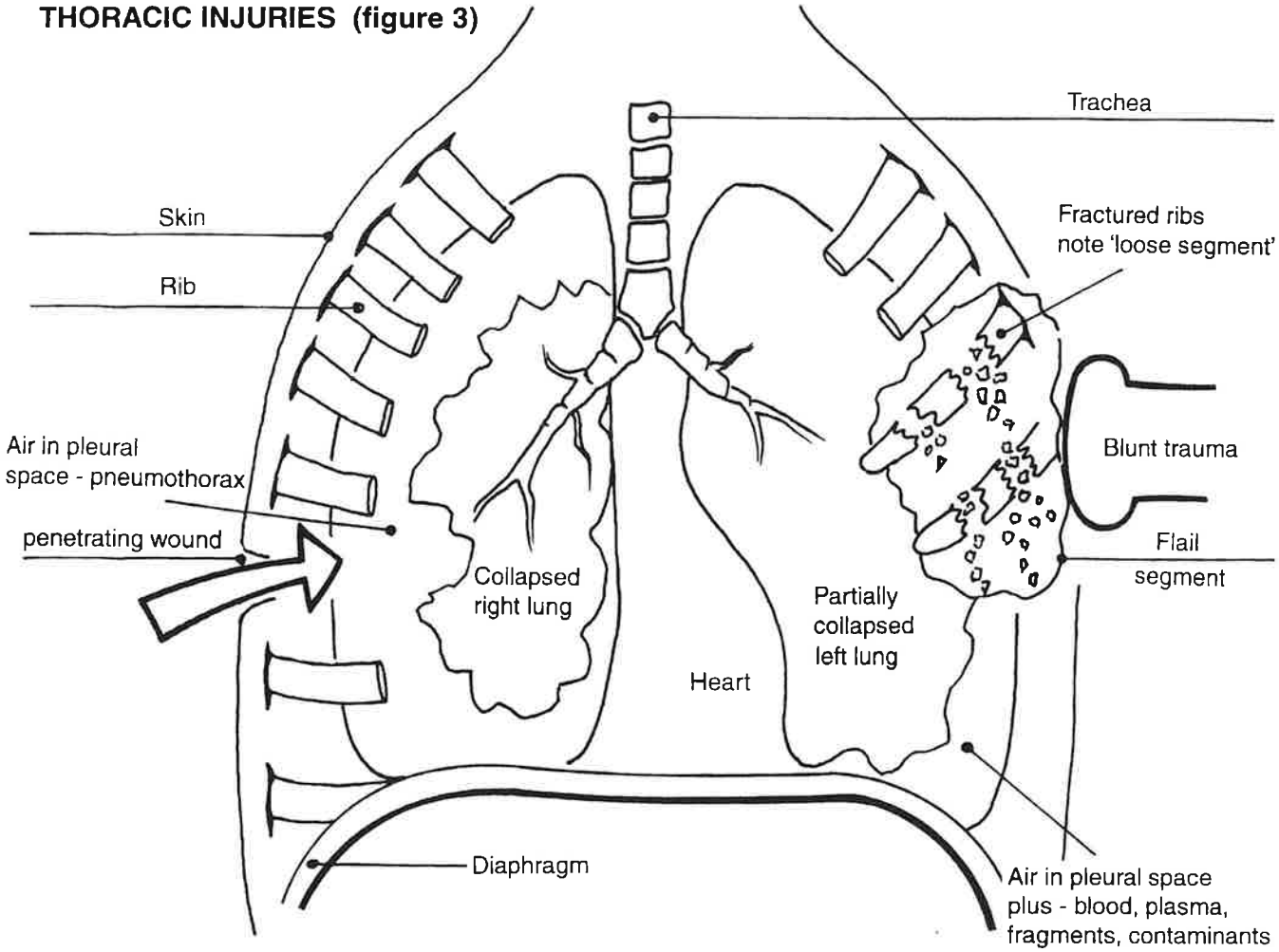
Fractured ribs

The casualty with fractured ribs may experience:
- pain - a sharp knife-like pain on inspirational effort that increases on movement and/or coughing;
- tenderness at the site of the injury;
- breathing that is short and rapid;
- blood stained, frothy sputum.

Inhalation analgesics such as Entonox or Penthrane may be beneficial in alleviating the discomfort of the casualty and preventing respiratory distress.

Respiratory distress is characterised by:
- increased (laboured) breathing effort associated with gasping and wheezing;
- increased (shallow) breathing rate influenced by pain on respiration;
- increased heart rate;
- the casualty's colour may vary from pale to grey or blue (cyanosed) especially around the lips;
- incomprehensible speech;
- unconsciousness.

THORACIC INJURIES (figure 3)



Flail chest

A flail chest is characterised by the loss of stability of the chest wall as the result of multiple rib fractures or a detachment of the sternum from the ribs that is caused by a severe crushing injury to the chest wall.

The mobile chest segment (flail) moves inwards paradoxically on inspiration (Fig. 3). The affected lung collapses and there is less lung tissue to function for gaseous exchange. The casualty increases breathing rate but is limited by extreme pain on inspiration or movement in the area of the trauma. Severe respiratory and circulatory compromise results. **This is a life threatening situation that requires urgent referral to medical aid.**

Open pneumothorax

An open pneumothorax or sucking wound of the chest can occur following trauma and is a defect or perforation to the chest wall that results in pressure equilibrium between the atmosphere and that of the chest. Instead of the normal passage of air to the lungs, air enters through the chest defect via the path of least resistance. The lung beneath collapses. This process results in severe hypoxia and compromise to the casualty.

Spontaneous pneumothorax

There are times when a casualty may have a spontaneous rupture of the outer lining of the lung. These are often young casualties with a history of no recent trauma but symptoms are suggestive of a pneumothorax.

Pneumothorax - signs and symptoms

Signs and symptoms of a collapsed lung include:

- inspirational pain that may radiate to the casualty's shoulder blade on the injured side;
- breathing difficulty;
- restricted or no movement of the chest wall on the affected side;
- weak and rapid heart rate.

Tension pneumothorax

Air enters the pleural cavity because of a one-way valve air leak from the lung or through the chest wall, with progressive increase in pressure within the pleural cavity resulting in compression and collapse of the affected lung. If the tension pneumothorax is not resolved through urgent medical intervention, displacement of the mediastinum to the opposite side occurs, with decreased venous return and compression of the opposite lung (American College of Surgeons, 1997, pp. 128-9).

General Management of Chest Injuries - Primary Survey

The Primary Survey incorporates **the D.R.A.B.C. Action Plan**, that is a hierarchical and priority-based process that guides the first aider in the treatment of the casualty.

Danger: Ensure safety of first aider, casualty and others.

Response: Check the casualty for a response:
- Do not move the casualty (unless he/she is in further danger).
- If the casualty appears unconscious, place in recovery position **with the injured side down.**

Airway:
- Open the casualty's mouth and relieve any obstruction.
  Avoid neck movement. The first aider should always consider the possibility of the coexistence of 'cervical and/or thoracic spine injury/ies resulting from trauma.

Breathing:
- Keeping the airway open, look, listen and feel for breathing (more than an occasiona gasp)
- Look for chest movements (presence of paradoxical respirations).
- If the casualty is not breathing, commence E.A.R. (refer to Module 1).

If the casualty is breathing:
- Place the casualty in a position (sitting up with injured side down) that facilitates breathing.
- Alternatively, place the casualty in the recovery position (with injured side down) if there is breathing difficulty, if vomiting is likely or if the casualty becomes unconscious.
- Remove or cut clothing to expose wound.
- Cover the wound - use the casualty's or your own hand to stop air flowing in and out of the chest cavity.
- Cover the wound with a dressing (such as a plastic sheet, bag or aluminium foil) - if not available, use a sterile dressing or pad.
- Seal with tape on three sides (not bottom).
- Administer oxygen therapy via a face mask at 8 litres per minute.
- Administer analgesia to the casualty if authorised to do so and if trained in their use.
- Check for continued breathing.

Why is the occlusive dressing over the chest wound taped on three sides only? Refer to Module 3 on Wounds for the answer.

Circulation:
- Assess the casualty for signs of circulation by checking if the carotid pulse is present;
- If there are no signs of circulation, commence C.P.R. (refer to Module1 on Resuscitation).
- If the casualty has a carotid pulse and adequate cardiac output:
  . check for and control haemorrhage;
  . treat for shock.

Management - Secondary Assessment

The secondary assessment of the casualty includes:
- reassurance;
- loosen tight clothing;
- full examination of the casualty;
- obtaining a history of events from the casualty:

- **A**llergies;
- **M**edications currently used;
- **P**ast illnesses/**P**regnancy;
- **L**ast meal;
- **E**vents/**E**nvironment related to the injury.

- excluding other injuries;
- treating other injuries;
- referring casualty urgently to medical aid;
- checking vital signs, skin colour and chest wound every fifteen minutes or more frequently, depending upon the casualty's condition.

Infection control and environmental considerations

It is important to prevent further wound contamination and heat loss of the casualty. The use of Standard Precautions, dressings and heat loss (space) blankets all contribute to optimising casualty outcomes.

General discussion

Because of the anatomical proximity of major organs in the chest, injuries that are the result of blunt or penetrating trauma may involve multiple structures. Injuries to major organs may include tears or ruptures of:

- bronchi and bronchioles;
- heart and surrounding pericardial sac;
- major blood vessels that include aorta, vena cava and pulmonary vessels;
- the oesophagus.

Chest injuries that involve major structures and/or organs are **life threatening and require the first aider to arrange urgent transport of the casualty to medical aid.** First aid intervention is focussed on strategies that are supportive in nature and include:

- D.R.A.B.C. Action Plan;
- control of haemorrhage;
- management of shock;
- monitoring of vital signs;
- documentation (OB12 form);
- communication and teamwork to facilitate urgent transport of the casualty to medical aid and to maximise survival outcomes.

Paradoxical respirations

Paradoxical respirations occur when all or part of the chest wall moves in during inspiration and out during expiration.

What is the normal process? Whilst watching your own chest, take a deep breath and then slowly exhale.

Paradoxical respirations are the result of fractured ribs that are broken in two or more places and are no longer attached to the bony rib cage, resulting in a free, floating section. Paradoxical respirations are considered to be life threatening and the casualty should be transported urgently to medical aid by ambulance.

10.1 Manage a chest injury

SCENARIO: You are on duty at a soccer match when you are asked to attend a player in the clubrooms with suspected fractured ribs.

Checklist	Needs Improvement Date	Proficient Date
Primary Assessment **D**anger On approaching the casualty, observe the scene for dangers: - to yourself; - to others; - to the casualty (seek early police assistance if necessary).		
Response - (yes); - speak to the casualty; "Lie/stay still - don't move" (casualty to be kept in the most comfortable position); " I am a a first aider and I can help you"; "My name is....."; "What is your name?"; - clues for possible injuries.		
Airway - visibly check airway (mouth); - maintain a clear and open airway.		
Breathing - (yes) - ask the casualty what happened - "Tell me what happened"; - place the casualty in a position (sitting with injured side down) that facilitates breathing; - alternatively, place the casualty in the recovery position with the injured side down if there is breathing difficulty, if vomiting is likely or if the casualty becomes unconscious; - explain to the casualty that you are going to make an examination; - remove or cut clothing to expose the chest; - encourage the casualty to breathe with short breaths; - place padding over the injured area; - apply one or two broad bandages (depending on the size of the casualty), securing the arm and padding to the chest on the injured side; - tie bandage in front of the casualty on the uninjured side; - if the casualty complains of increased discomfort following application of bandages, loosen or remove bandages; - immobilise the arm, using a St John sling or collar and cuff sling; - administer oxygen therapy via a face mask at 8 litres per minute; - administer analgesia if authorised.		

Checklist	Needs Improvement Date	Proficient Date
Circulation - (yes); - check for and control haemorrhage (refer to Module 7 on Haemorrhage); - treat for shock (refer to Module 8 on Shock).		
Secondary Assessment - full examination of casualty; - reassure the casualty; - loosen tight clothing; - obtain a history of events from the casualty: . **A**llergies; . **M**edications current used; . **P**ast illness/**P**regnancies; . **L**ast meal; . **E**vents/**E**nvironment related to the injury; - check casualty for a Medic Alert bracelet; - exclude other injuries: look, listen and feel, checking for wounds, fractures etc.; - treat any injury; - refer casualty to medical aid; - check: . pulse; . respiration, rate, depth and effort; . blood pressure; . skin colour; - check level of consciousness: . **A**lert; . **V** - responds to **V**ocal stimuli; . **P** - responds only to **P**ainful stimuli; . **U**nresponsive to all stimuli; - check pupil response and size; - **recheck pulse, respirations, blood pressure, level of consciousness and pupils every 15 minutes.**		
General - complete OB12 Casualty Report form; - use Standard Precautions; - reassure and obtain support of relatives and/or friends; - handover to ambulance.		

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Planning for a Major Duty

REFERENCES:

St. John Management Training Module, Module K.
Emergency Management Australia,1997, *Mass Gathering Medicine Workshop*, Mt. Macedon Paper Number 1/1997, Emergency Management Australia.
De Lorenzo, R.A., 1997, 'Mass gathering medicine : a review', *Prehospital and Disaster Medicine*, 12, (1) pp. 68-72.
Flabouris, A. & Bridgewater, F., 1996, 'An analysis of demand for first aid care at a major public event', *Prehospital and Disaster Medicine*, 11, pp. 48-51.

OBJECTIVES :

11.1 To provide guidelines for Operations Branch members preparing to provide first aid at a major public event.

11.2 To undertake a practice planning session for an event held in your local area.

Introduction

Operations Branch provides first aid coverage at numerous public events throughout Australia each year, treating nearly 100,000 casualties. This is a substantial undertaking and we should be proud of the contribution that St. John makes to ensuring that these events are a successful, safe and enjoyable part of social life in Australia.

The provision of a voluntary first aid service is one of the principal activities of Operations Branch and involves more than simply being present at a venue and providing first aid to members of the public who approach us for care. The undertaking is, of course, much more complicated than this and involves being able to respond to calls for help that arise from locations throughout the venue, liaison with other agencies such as the police and event organisers, providing communications and logistical support to our members while they are on duty and so on.

This module will discuss some of the elements of planning that may be required to prepare for major duties. Remember, however, that all events are different and offer different challenges and your planning must be tailored to ensure that you can provide an efficient first aid response at your particular event. It is for this reason that Operations Branch officers must have good planning skills. There are several areas that you should think about when preparing for any major duty:

- attendance (crowd size/ age profile);
- personnel (first aiders and their qualifications);
- first aid triage and facilities;
- communications (mobile telephones and land lines/UHF and/or VHF radios);
- transportation (first aid units and the availability of ambulances);
- first aid records (casualty report forms, personnel on duty);
- public information (first aid information/ prevention/ head and heels packs);
- mutual aid and relationships with other agencies (police/event organisers);
- public access (visibility and access to first aid posts);
- disaster planning (venue evacuation and disaster arrangements);
- the operating environment (e.g. weather, terrain and duration);
- medical equipment;

and some of these are discussed below. At the end of this module you will be asked to prepare for a mock event so that you can practise operational planning and, while developing your plan, you should consider each of the points noted above.

What do we know about large public events?

Large public gatherings are often referred to as 'mass gatherings' and over the years much has been written about the characteristics of events attended by large groups of people. At the beginning of this module we noted several of the references in this area and you may want to refer to these sources for further information about the 'science' of mass gathering first aid.

So what do we know that might help us to be better prepared for the provision of first aid service at these events? A good starting point is to have an understanding of the number and type of casualties we can expect and what influences this casualty presentation rate. Several factors have been shown to affect the number of casualties that you will see while on duty.

What is the expected crowd size?

There is, naturally, a relationship between the number of people who will be at the event and how many casualties you will see. You should try to ascertain from event organisers and police how many people will attend. Sometimes ticket sales will give you a good idea for concerts and stadium events; and, at other times you will only be able to get an estimate of the number of people who will attend the event.

Crowd size is the most significant factor in determining the number of casualties we will have to treat.

On average, St John deals with 1 casualty for every 1,000 spectators. In a crowd of 50,000 you might, therefore, expect to see about 50 casualties. Obviously this is only a guide and other factors, for example the weather, will also effect the number of casualties. However, it is clear that in large crowds we need to be prepared to manage quite large numbers of casualties. The number of first aiders, equipment, transport and other resources to deal with 100 casualties in a crowd of 50,000 people is substantial and good planning is essential.

What kind of casualties can we expect?

In preparing for an event think about the types of injury and illness that you expect to see and ensure that you have the first aid supplies and equipment necessary to deal with these problems.

Respiratory illnesses, minor injuries (minor cuts, abrasions and sprains), heat related injuries and minor problems (headache, blisters, sunburn) typically make up 75% of casualty presentations at large public gatherings.

Among casualties requiring urgent treatment, asthma is the most common complaint.

Outdoor events produce more environmentally related injuries such as lacerations and sunburn. Events attracting young people, such as rock concerts, produce higher levels of alcohol and substance abuse related problems.

Cardiac arrests occur infrequently though on site resuscitation and defibrillation is very important and, if promptly and effectively implemented, will significantly improve the casualty's chance of survival.

How does the weather forecast affect our planning?

The weather (temperature and humidity) can have a significant effect at outdoor events on the number and type of casualties that will present to St John first aid teams. Increasing temperature, and, even more importantly, increasing humidity, often cause an increase in the number of casualties and particularly those suffering the effects of heat exposure.

What about the venue?

The venue itself will influence the management of the event. For example, stadium events, with the public seated, typically produce fewer casualties than events where the public is mobile or involved in more strenuous activities. Thus, the casualty presentation rate at a football match is often relatively lower than the rate for a similar sized crowd at the Easter Show.

Age profile?

The expected age profile of the crowd should also be considered. For example, the young audience at a rock concert will present a different range of casualty problems from those encountered at an event attended by older people. Often the number of casualties per thousand at these events is significantly higher.

Planning for an event.

In developing an operational plan for a major event, Operations Branch commanders should consider:

- the number of first aiders to be allocated to the event;
- the range of basic and advanced life support qualifications required;
- response strategies - where will first aid teams be positioned;
- communications equipment and protocols;
- transport on site;
- transport to hospitals;
- liaison with other services and event organisers.

Mobile patrols or response teams?

One of the most important considerations when planning for an event is the development of a response strategy for the venue. This involves making decisions about the location of first aid posts, the number of first aiders, where they will be located and how they will be responding to incidents. Often first aiders will patrol throughout the event area. However, it is important that first aid posts are clearly visible to members of the public who may be seeking assistance because often calls for help will come to these posts. First aid patrols must be in radio contact so that they can respond to urgent calls for assistance. Your response strategy should ensure that first aiders and specialist equipment are positioned to ensure a reasonable response time to any incident that may occur within the venue. Sometimes it is also necessary to consider the need to respond to incidents in the near vicinity of the event or outside of the venue where crowds of people may also gather.

How will you receive calls for help?

Think about sources of information and establishing adequate liaison and contact with event organisers (and security), police and the ambulance service. Remember that the increasing availability of mobile telephones means that calls for assistance will often go directly to the ambulance service on the '000' emergency number. The ambulance service needs to know that you are in attendance at the event and how to contact you. Similarly, you should maintain a communication link with event organisers and event security. Often members of the public will seek help from the first 'official' that they encounter and these groups must be able to contact you. This will ensure that you are notified of urgent calls for assistance. Your command post should, generally, be in close proximity to the commanders of other services such as police.

Will ambulances be available on site?

Sometimes a decision is made during the planning phase to place an ambulance on standby at the event. This decision is dependent upon the ease with which ambulances can access the event and the expected need for casualties to be transported to hospital. Typical transportation rates from major events vary from 2% to 4% of casualties seen by the first aid service. On average, at events attended by St John, 0.027 casualties per 1000 spectators require ambulance transport. In other words, in a crowd of 50,000 people, we might expect 1 or 2 to require transport to hospital. Once again these figures only provide a guide but it is clear that in a larger crowd we should liaise with the ambulance service to ensure that transport is readily available. These arrangements must be made during the planning phase and not on the day of the event.

Site specific problems and planning.

Often you will need to draw on local knowledge and past experience to ensure that you are adequately prepared. You should liaise with other agencies or authorities involved in preparing for the event. For example, a large influx of respiratory problems during an outdoor parkland event might have been caused by the local government authority mowing grass around the area a day or so before the event. Next time the event is held you should raise this issue during the planning phase to ensure that the problem is not repeated and ensure that you are adequately prepared for respiratory cases.

Dealing with the unexpected?

Preparing for the unexpected is an important, though often overlooked, part of the planning process.

Operations Branch members who assume responsibility for planning the first aid service at large events should ensure that they are familiar with arrangements for calling out senior officers and, where necessary, additional Operations Branch resources. Often, the State/Territory will maintain a duty officer system and senior officers will be available on a 24 hour basis.

Major event venues will often have their own disaster and evacuation plans. You should familiarise yourself with these and ensure that you know where the evacuation points are (and therefore where the crowd will be in the event of an evacuation). Operations Branch members should be briefed about disaster and evacuation arrangements at the beginning of the duty and it is important that all members know where they should report and what they should do in the event of a major incident or disaster. Your response to a significant emergency such as stand collapse will fail if members are not briefed before the incident occurs. Liaison with other emergency services and familiarity with their response arrangements is also important.

Mass gathering research

St John has recently completed a major research project supported by the Australian Rotary Health Research Fund and a St John Ambulance Australia research grant. This research looked at the causes of casualty injury o illness at about 240 large events attended by St. John throughout Australia. The project is important for two reasons. First, because it helps us to predict how many and what sort of casualties we can expect to see at different events and venues and therefore assists in our planning for these events. And, second, because it ensures that St John first aid planning is based on up-to-date information drawn from our own experiences. We expect a summary of the findings of the project will be available at the time of publication on the St John website (http:\\www.stjohn.org.au).

Mass gathering planning exercise

Generally Operations Branch members are very experienced in planning and managing the first aid services tha we provide. We hope that some of the ideas that we have presented above will cause you to re-think your approach to planning events in your area or at least cause you to think more broadly about this task. If there is a common criticism of our event planning it may be that we tend to focus on the provision of casualty care rather than the coordination and management of the first aid service. While casualty care issues such as staffing levels and the supply of first aid equipment must be at the core of our planning, the success of our first aid service depends, also, on the development of relationships with other agencies, effective communication and disaster planning. Often we develop an understanding of these broader issues by discussing our approaches to planning with others.

Practical Planning Exercise

As part of your training program we suggest that you review the operational plan for a major event in your local area. This exercise could be done in groups so that ideas can be shared and you can work through some of the issues and headings identified in this module, applying them to your own local context.

In developing your plan consider the following areas:

- attendance (crowd size/ age profile);
- personnel (first aiders and their qualifications/ other expertise);
- first aid triage and facilities (what will be required?);
- communications (mobile telephones and land lines/UHF and/or VHF radios/ communication protocols and call signs);
- transportation (first aid units, the availability of ambulances and ambulance rendezvous/ loading points);
- first aid records (casualty report forms, personnel on duty);
- public information (first aid information/prevention/head and heels packs of bandaids and paracetamol);
- mutual aid and relationships with other agencies (police/event organisers);
- public access (visibility and access to first aid posts);
- disaster planning (venue evacuation and disaster arrangements);
- the operating environment (e.g. season, weather, venue, terrain and duration);
- document operational plan;
- member briefing (who will do this and what information must be included?);
- feedback to event organisers;
- evaluation - operational plan - following the event/duty.

Semi-Automatic External Defibrillators

Assessment not required for this module.

OBJECTIVES: On completing the module, the member will:

12.1 state the importance of early defibrillation in the resuscitation process;
12.2 demonstrate a personal choice in whether to undertake a training programme in the use of semi-automatic external defibrillators.

Sudden, unexpected cardiac death is a condition that is encountered by first response personnel. Until recently, the management of this condition involved cardiopulmonary resuscitation whilst awaiting the response of an ambulance, hopefully equipped with a defibrillator. Several factors have led to a substantial change in the Operations Branch response to such incidents.

Ventricular Fibrillation

It has been well recognised for some time that the initial rhythm in most cardiac arrests is ventricular fibrillation (VF). This observation comes largely from the experience of ambulatory monitoring of casualties who happened to suffer a cardiac arrest whilst wearing such monitors. Typically, ventricular fibrillation begins as coarse, chaotic electrical activity that, within minutes, deteriorates into an absence of any discernible rhythm (asystole). The opportunity to defibrillate the heart is therefore limited to a brief window of opportunity during the initial minutes following cardiac arrest. If the first monitoring of a casualty is delayed until ambulance arrival, typically only one third of casualties will have ventricular fibrillation as the first recorded rhythm. In comparison, if monitoring is performed by first response personnel already at the scene, ventricular fibrillation is found in virtually all casualties. It has also clearly been demonstrated that successful restoration of a perfusing rhythm is inversely related to the duration of ventricular fibrillation, i.e. defibrillation within one minute of the onset of VF is much more likely to produce a perfusing rhythm than defibrillation occurring five minutes after the onset of VF. Increasing experience with early defibrillation, by lay persons, using semi-automatic external defibrillators (SAEDs) has demonstrated substantial improvements in survival rates from cardiac arrest. This improvement has been broadly estimated at 10% per minute for the first 10 minutes following cardiac arrest.

Semi-Automatic External Defibrillators

For many years the delivery of defibrillation has necessitated extensive training. This has included not only safety aspects but also the recognition of cardiac rhythms suitable for defibrillation. In recent years, technical advances have resulted in defibrillators with rhythm detection algorithms. This technical advance occurred due to the development of implantable defibrillators, i.e. individual surgically implanted devices that clearly would need to operate autonomously in terms of detecting and treating ventricular fibrillation. This technology is now available for external defibrillators, taking the guesswork out of rhythm recognition. These devices are portable and lightweight and are extremely easy to use. More importantly, they are reasonably inexpensive, being about one third the cost of manual defibrillators. Further advances in these devices have been made by providing voice prompts and reducing the number of tasks that a rescuer must perform in order to defibrillate a casualty. A recent study revealed that a group of essentially untrained sixth graders were able to successfully and safely defibrillate a manikin in a mock out of a hospital cardiac arrest scenario. Their performance, including appropriateness of pad placement, was similar to that of a group of experienced paramedics. **The only difference between the two groups was that the paramedics delivered the first shock within 67 seconds of attending the scene whereas the school children took 90 seconds.**

Defibrillation by Operations Branch Personnel

A relatively small number of defibrillators has been used by Operations Branch personnel for some years. Despite this, significant success has been achieved. The survival rate for sufferers of cardiac arrest at the Melbourne Cricket Ground is the best ever reported in the world for out-of-hospital cardiac arrest. This experience, plus the improved technology available, has resulted in the Operations Branch moving to expand the use of semi-automatic external defibrillators at public duties. In this regard, St John is a world leader in the delivery of resuscitation to the community. A recent study conducted in South Australia has indicated that it is feasible to train any Operations Branch member in the use of SAED's, the skill being readily maintained over a six month time frame. However, it was also noted that the level of skill retention was directly related to the number of occasions that the member took an SAED on duty. SAED training is now available to all members, including some cadets. It remains important for St John to continuously evaluate its defibrillation training and delivery in order to accurately predict future requirements.

Chain of Survival

It is important to remember that early defibrillation is but one link in the chain of survival (see diagram). Optimal survival from unexpected cardiac arrest requires early recognition of the event, i.e. a witnessed event, the early provision of cardiopulmonary resuscitation, the provision of defibrillation immediately it is available, and early access to advanced cardiac care. The major shift in focus of the Operations Branch to include early defibrillation in the routine provision of cardiac arrest therapy brings us one step closer to providing all steps. While there is very little evidence to support the role of the final link in the chain, advanced cardiac care, this hypothesis is yet to be adequately tested in a system where the first 3 links are rapidly available. Advances in the use of SAED's are likely to see this issue resolved in the coming years.

Activities

1. Discuss the implications of this module in conjunction with Module 1 - Resuscitation.

2. Provide an opportunity for members to familiarise themselves with semi-automatic external defibrillators.

3 Provide an opportunity for members to openly discuss any concerns, training programmes and operational strategies in relation to semi-automatic external defibrillators.

RECORD OF SKILL MASTERY - 2001

Tick the box for 'Satisfactory', 'Fail' or 'Re-test'. Please write the examiner's family name in block letters. One of the following is to be entered under 'Position' below: MO = Medical Officer, NO = Nursing Officer, AO = Ambulance Officer, ADT = Divisional Trainer approved by District Medical Officer and TBAI = Training Branch Accredited Instructor.

Skill	Satis.	Fail	Re-test	Date	Examiner's name / Examiner's Signature / Position
1.1	❐	❐	❐		Examiner's name Examiner's Signature Position
3.1	❐	❐	❐		Examiner's name Examiner's Signature Position
4.1	❐	❐	❐		Examiner's name Examiner's Signature Position
5.1 5.2 5.3 5.4	❐ ❐ ❐ ❐	❐ ❐ ❐ ❐	❐ ❐ ❐ ❐		Examiner's name Examiner's Signature Position
6.1 6.2 6.3	❐ ❐ ❐	❐ ❐ ❐	❐ ❐ ❐		Examiner's name Examiner's Signature Position
7.1	❐	❐	❐		Examiner's name Examiner's Signature Position
8.1	❐	❐	❐		Examiner's name Examiner's Signature Position
9.1 9.2	❐ ❐	❐ ❐	❐ ❐		Examiner's name Examiner's Signature Position
10.1	❐	❐	❐		Examiner's name Examiner's Signature Position

Glossary

anaphylaxis:	hypersensitivity to a second or subsequent dose of antigen.
digital clearance:	using fingers to clear.
digital pressure:	using fingers to apply pressure.
distal:	situated away from the centre of the body.
glaucoma:	condition caused by increased pressure of fluid within the eyeball.
hypoxia:	a deficiency of oxygen in the tissues.
impervious (flooring):	not affording passage to a fluid.
incontinent:	unable to control movements of the bladder or the bowels or both.
lucid:	able to think clearly.
non palpable (pulse):	cannot be felt.
opaque (lens):	lack of transparency.
paradoxical breathing:	breathing movements in which the chest wall moves in on inspiration and out on expiration, in reverse of the normal movements.
tourniquet:	device for stopping a flow of blood through an artery, usually a cord or tight bandage.

Fitness Test

Assessment for all Operations Branch members to be able to wear the uniform - One Person C.P.R. (Adult)

Notes for examiner

1. Members do this test when they are prepared to demonstrate their ability in C.P.R. and fitness.
2. A pocket mask may be used during this exercise.
3. Members may choose to stop at any time during this assessment.
4. Examiners are asked to stop any member who is experiencing undue physical distress during this test.
5. A member may present as many times as necessary to complete this test piece.
6. Members should aim to achieve 60 compressions per minute with a 15:2 cycle.

Demonstration of ability and fitness

Tick box if task is performed

1. Check for danger ❒
2. Check for response ❒
3. Recovery position ❒
4. Call for help ❒
5. Airway clearance ❒
6. Breathing check (ten seconds) ❒
7. Supine position ❒
8. Two effective breaths ❒
9. Pulse check (ten seconds) ❒
10. Initiation of C.P.R. ❒

Duration of C.P.R. in minutes 1 ❒ 2 ❒ 3 ❒ 4 ❒ 5 ❒ 6 ❒ 7 ❒ 8 ❒ 9 ❒ 10 ❒

Call for ambulance ❒

Pulse and breathing checks ❒ ❒ ❒ ❒ ❒ ❒ ❒ ❒ ❒ ❒

Fitness Test EXAMINER Please tick

The member has satisfactorily performed ten minutes of continuous one-person C.P.R. on a manikin. Yes ❒ No ❒

Please sign and **print** name

Signed: .....Date ..... / ..... / 2001

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

DECLARATION OF CONTINUED FITNESS FOR PUBLIC FIRST AID DUTIES

The following Declaration of Fitness for Duty is in line with the policy issued in Chief Commissioner's Order 7/00 of 10 July 2000:

I understand that, as a member of St John Ambulance Australia Operations Branch, I may be required to perform a variety of tasks and duties and assume responsibilities including those listed below:

1. *To perform first aid duties in all circumstances including emergency and stressful situations which have been explained to me.*
2. *To work as part of a team and accept directions.*
3. *To communicate orally with casualties, fellow workers and the public in various environments and appropriately complete a casualty report form (OB12).*
4. *To perform 10 minutes of effective one person adult Cardio-Pulmonary Resuscitation. (This ability will be tested annually)*
5. *To carry a first aid kit and other emergency apparatus, weighing up to twenty kilograms, a reasonable distance to a casualty and administer first aid in a timely manner in a variety of environments.*
6. *To assist in moving a casualty if needed and carry, with the assistance of one or more first aiders, a casualty on a stretcher a reasonable distance.*
7. *To lift a casualty as part of a team when required and manoeuvre and load a casualty, with or without assistance, onto a stretcher.*
8. *To undertake study programmes, participate in gaining and developing the knowledge and skills relating to first aid and use the knowledge and skills acquired from such study programmes.*
9. *To recognise limits of first aid and my abilities and to be ready to ask for help.*
10. *To take precautions for my safety and those for whom I am caring, including maintenance of personal immunisation status and carrying out of protective measures (e.g. wear latex gloves) consistent with the duties to be performed.*

I have read and understood the relevant St John policies and procedures.

.....

I am able to fulfil the requirements for public first aid duties. If at any time I am no longer able to do so, I will advise the appropriate officer at the earliest practical moment.

I acknowledge that:

- *a false or misleading statement could lead to disciplinary action.*
- *there are health risks associated with smoking, excess alcohol intake and the use of illicit drugs. These activities may also adversely affect my ability to effectively serve the community.*
- *St John Ambulance Australia has a duty to ensure that members allocated to a duty are able to function safely and effectively.*

If at any time, even at the time of this declaration, it becomes apparent, or there is reason to believe, that I am unable to safely and effectively perform the duties and requirements of my position, I may be invited to attend a medical examination for a "Review of Ability" by an Operations Branch medical officer. I may elect to have this assessment, at my expense, by a private practitioner of my choice.

Signature:..... Date: / /

The Superintendent/Officer-in-charge is to send the bottom section of this page to the State/Territory Medical Officer at Headquarters.

CONFIRMATION OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME, 2001

Name (please print).....
Family name

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

Signed.....Date...../...../ 2001
Member to sign when Programme completed

The above member has completed the programme to my satisfaction:

.....Date...../...../ 2001
Person responsible for training, print name and address and sign

.....Date...../...../ 2001
Divisional, Corps or District Medical Officer responsible for training, print name and address and sign

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 Advanced Certificate (incorporating the former Medallion Certificate) accreditation or re-accreditation.

.....Date...../...../ 2001
Training Branch Accredited Instructor, print name and address and sign

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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 State Territory Medical Officer. **A record of receipt will be held at State/Territory Headquarters.**

.....
Cut Here

ADVICE OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME, 2001

This is to advise that

Name (please print).....
Family name

of..... Division who joined St John ...../...../.....

has completed the Skills Maintenance Programme for 2001. The confirmation of this fact in the member's manual has been duly and fully completed.

Name (please print).....
Person responsible for training, print name and sign

Position.....

Signed.....Date...../...../ 2001

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 Advanced Certificate accreditation or re-accreditation.

.....Date...../...../ 2001
Training Branch Accredited Instructor, print name and brief address and sign