Skills Maintenance Programme 1999

St John Ambulance Australia

St John Ambulance Australia
OPERATIONS BRANCH

Skills Maintenance Programme 1999

Name ....

Signature ....

Division ....

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

St John Ambulance Australia
Canberra Avenue
Forrest ACT 2603

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Note:
'A.F.A.' refers to *Australian First Aid,* 1998.
'A.R.C.' refers to the Australian Resuscitation Council *Policy Statements.*

Introduction to Skills Maintenance Programme 1999

To my friends, colleagues and co-workers:

As I think back over the last year and look forward to 1999, I am struck once again by the remarkable commitment that you have shown. The mere statistics in the Annual Report do not do you justice.

Who was it that said "Any man's death diminishes me, because I am involved in mankind"?

The last half of that quotation could well be a translation of the motto that we know so well - "Pro utilitate hominum". In the same passage, the writer says "No man is an island entire of itself". Both of these sentiments reflect an intense and close relationship with those around him. I think that often describes the relationship between individual members of St John and between St John and the wider community. This involvement is nearly always at a cost. It may be personal, involving time and money; it may be emotional with contrasting elation and conflict and it may require that those closely linked with you also become involved. The most effective form of involvement develops when a particular need is being met and the most reliable way to find out what is needed is to ask those in need. Dr Don Hopgood, Moderator of the Uniting Church in South Australia, reminded us of that recently. The question we should be asking the community (as Jesus of Nazareth did) is "What do you want me to do for you?"

The *Skills Maintenance Programme 1999* requires you to continue that involvement and I trust that, for both the newcomer and the old hand, it is a challenging and rewarding exercise. The preparation of the programme is a task involving a large number of members and we are indebted to them.

Last year I spoke of change occurring and in 1999 you will encounter changes to C.P.R. recommended by the International Liaison Committee on Resuscitation (ILCOR for short). These recommendations need to be interpreted and implemented by each organisation according to its particular needs. For example, the practice of St John covers a wider field than that of the Surf Life Saving Association and so it is not surprising if the implementation of ILCOR's recommendations differs between these two bodies. Differences between Branches within St John can be harder to explain and understand. There are often valid reasons for such variability, particularly when considering the variability between districts determined by legislation and personal bias! Nevertheless, a determined attempt to unify teaching is under way. To introduce changes synchronously requires definite forward planning!

At the end of 1998, Associate Professor Fred Leditschke will be concluding his research based on the Utstein forms. He has amassed a unique data base and would like to thank all enthusiasts who responded. The availability of semi-automated defibrillators (SAEDs) to an ever increasing number of members heralds a new era in first aid and data to be published soon from Victoria District on their Melbourne Cricket Ground experience with SAEDs will give all St John members great pride.

I am looking forward to meeting some of you during the year.

Franklin H G Bridgewater
Chief Medical Officer

Please make sure that you are up to date with the latest edition of *Australian First Aid*. A 32 page booklet, *Emergency First Aid A quick guide*, has been extracted from *A.F.A.* and is available for $1.

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CARDIAC ARREST RESEARCH

With the completion of data collection for Associate Professor Leditschke's research, the Utstein-style form has been omitted from this Manual. Please do not submit further copies of past forms.

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 District 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 in 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

PRESCRIBED REFERENCES: St John Ambulance Australia (1998). *Australian First Aid*, reprinted annually, Chapter 2.
Australian Resuscitation Council *Policy Statements*.

OBJECTIVES:

1.1 On completion of the training period, and after practising the practical skill listed below (to the satisfactory performance level as per the module points/checklists), the member will be able to apply this skill to the section's practical incident.

1.2 To advise members of the changes in C.P.R. protocols and rates.

Sequence of Action

Dangers 1. Ensure safety of first aider and casualty.

Response 2. Check the casualty for a response:

Gently shake the casualty's shoulders and ask loudly: "Can you hear me? Open your eyes."

2 (a) If there is a response (the casualty answers or moves):

- Do not move the casualty (unless he/she is in further danger), check the casualty's condition (A.B.C. and Casualty Examination), and get help if needed.

- Reassess the casualty's condition regularly.

2(b) If the casualty does not respond:

- **Place in recovery position.**

Airway

- Open the casualty's mouth and check that there are no obstructions. Dislodged teeth and loose dentures should be removed but well-fitting dentures should be left in place.

- Open the casualty's airway by tilting the head and lifting the chin.

- If possible, place your hand on the casualty's forehead and gently tilt the head back.

- At the same time, with your fingertip(s) under the point of the casualty's chin, lift the chin to open the airway.

- Avoid neck movement if trauma (injury) to the neck is suspected.

Breathing 3. Keeping the airway open, look, listen, and feel for breathing (more than an occasional gasp):

- Look for chest movements.

- Listen at the casualty's mouth for breath sounds.

- Feel for air on your cheek.

- Look, listen, and feel for up to 10 seconds before deciding that breathing is absent.

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

- Leave the casualty in the recovery position. Assess Circulation and perform casualty examination.

- Check for continued breathing.

3 (b) If the casualty is not breathing:

- Send someone for help. If you are on your own, leave the casualty and go for help; return and start rescue breathing as below.

- 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. (as outlined below) 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.

- Turn the casualty onto his/her back.

- Ensure head tilt and chin lift.

- Give 2 effective ventilations.

If you have difficulty achieving an effective breath:

- Recheck the casualty's mouth and remove any obstruction.

- Recheck that there is adequate head tilt and chin lift.

- Make up to 5 attempts in all to achieve 2 effective breaths.

Even if unsuccessful, move on to assessment of circulation.

Circulation 4. Assess the casualty for signs of circulation. This includes:

- looking for any movement, including swallowing or breathing (more than an occasional gasp);

- checking if the carotid pulse is present.

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

4 (a) If you are confident that you can detect signs of circulation **within 10 seconds:**

- Continue rescue breathing, if necessary, until the casualty starts breathing on his/her own.

- About every minute, recheck for signs of circulation; **take no more than 10 seconds each time.**

- If the casualty starts to breathe on his/her own but remains unconscious, 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 rescue breathing if breathing stops.

4 (b) If there are no signs of circulation or if you are at all unsure:

Start chest compression:

- Locate the lower half of the sternum (breastbone), and place the heel of one hand there, with the other hand on top of the first.

- Interlock the fingers of both hands or hold wrist to ensure that pressure is not applied over the casualty's ribs.

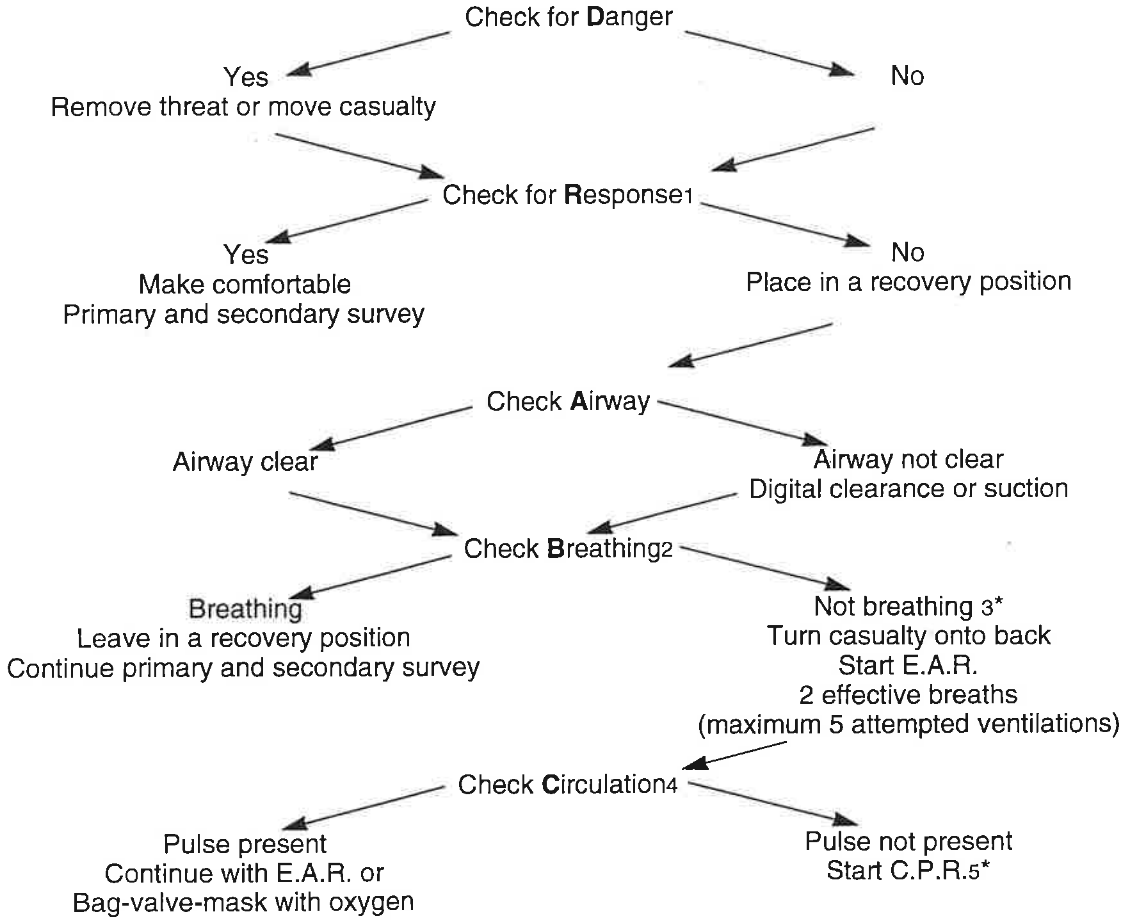
- Do not apply any pressure over the upper abdomen or bottom tip of the sternum.
- Position yourself vertically above the casualty's chest, and with your arms straight, press down on the sternum to depress it between 4 and 5 cm (1.5 to 2.0 inches).
- Release the pressure, then repeat at a rate of about 100 times a minute (a little less than 2 compressions per second). Compression and release should take an equal amount of time.
- Combine rescue breathing and compression.
- 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.
- After 15 compressions, tilt the head, lift the chin, and give 2 effective breaths.

5. Continue resuscitation until:

    - the casualty shows signs of life;
    - qualified help arrives;
    - you become exhausted.

Basic Life Support

Resuscitation algorithm for a collapsed/unconscious casualty



* These are critical decision points.

1 When two first aiders are present, one should seek help at this point while the other continues with resuscitation.
2 Take **at least** ten seconds to conclude breathing is absent.
3 When the casualty is an adult and there is no evidence of near-drowning or injury, **the single rescuer should leave the casualty in the recovery position and seek help at this point.** It is probable that the cause is cardiac and the greatest benefit will be achieved with SAED.
4 Take **no more than** ten seconds to conclude that a pulse is absent and during this time look for other signs suggestive of a circulation, such as attempted swallowing or breathing.
5 When the likely cause of collapse is near-drowning or an injury or the casualty is a child or an infant, **the single rescuer should continue C.P.R. for about one minute and then seek help, leaving the casualty in a recovery position.** In the case of an infant or child, if possible, the first aider should take the casualty with him/her while seeking help.

Resuscitation Rates

During C.P.R., allow equal time for compression of the chest and for relaxation.

	9 years and older	**1-8 years**	**0-1 year old**
INITIAL VENTILATION	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 puff 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 puff in 5 seconds; 12 cycles/min.
TWO OPERATOR	5 compressions to 1 breath in 5 seconds 12 cycles/min.	5 compressions to 1 breath in 5 seconds 12 cycles/min.	Not recommended
REVIVAL CHECKS	Pulse and breathing at end of first minute Then about every minute		

* "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.

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 - 2 effective breaths. - Good seal. - 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.		
CASUALTY VOMITS	- Turn casualty on side. - Digital clearance on side. - Return casualty to back - Continue ratio of 5:1.		

	Checklist	Needs Improvement Date	Proficient Date
AMBULANCE	Hand over.		
RELATIVE ARRIVES	If possible, obtain history and complete OB 12 Casualty Report form.		
GENERAL	- Calls for help at appropriate times. - Use of Standard Precautions.		

Verbal assessment

What information would you give to the ambulance officer on hand over?
What can you check for to assess whether your C.P.R. is effective?
Explain how you would clean and/or dispose of your equipment and how you would clear the vomit/blood that is on the ground.

Comments

Choking

Respiratory distress is said to be present when a casualty experiences shortness of breath or difficulty in breathing. Choking is a particular form of respiratory distress associated with partial or complete obstruction of the upper airway.

CAUSES

These may be classified depending on the level of obstruction relative to the voice box (larynx), i.e. above / at / below the voice box.

1. **Above the voice box (supra-laryngeal):**

Causes may be:

- foreign bodies:
  e.g. partly chewed food, pills, bones, coins or inhaled objects:
- injuries:
  - head injuries associated with unconsciousness may be linked with choking when the tongue, blood or mucus causes obstruction;
  - direct injury to the tongue or jaw can have an identical effect;
- infections:
  - obstruction associated with infection, e.g. 'quinsy', can arise quickly and be life-threatening;
  - swallowing is painful and drooling may be noticed;
- allergies:
  rapid swelling of the tongue and back of throat can develop in minutes.

2. At the voice box (laryngeal):

Causes may be:
- a foreign body;
- trauma:
  a direct blow may fracture or bruise the voice box causing swelling;
- reflex closure:
  the presence of blood, mucus or a foreign body in the voice box may stimulate a reflex partial closure of the vocal cords with associated stridor;
- infection:
  'croup' (laryngo-tracheo-bronchitis) can affect children and be of dramatically rapid onset.

3. Below the voice box (sub-laryngeal):

Causes may be:
- a foreign body;
- a tumour.

PRESENTATION

The casualty may:
- be anxious;
- be clutching at the throat;
- cough uncontrollably or be wheezing or gagging;
- have trouble speaking or swallowing;
- be desperately trying to catch a breath;
- have prominent veins in the head and neck region;
- be blue in the lips, ears and fingers (cyanosed);
- become unconscious and stop breathing.

MANAGEMENT

Encourage the casualty to relax.
Position the casualty as comfortably as possible.
Encourage as many deep breaths as possible.
If the member is trained to give oxygen and if it is available, it should be given by mask at 15 lpm.

If it is suspected that the choking is associated with a foreign body:
- encourage the casualty to cough and try to expel the foreign body;
- if unsuccessful, place the casualty with the head low and give give 3-4 sharp blows between shoulder blades;
- if still unsuccessful, lay the casualty down and give 4 lateral chest thrusts;
- D.R.A.B.C. (if E.A.R./C.P.R. is required, 4 lateral chest thrusts should be given every 60 seconds until the airway is clear or an ambulance arrives);
- seek medical aid urgently.

If it is thought that the cause is related to an allergic reaction and the casualty has medication for this situation:
- D.R.A.B.C.;
- help in administration of medication;
- seek medical aid urgently.

If it is thought that the cause is related to an injury:
- D.R.A.B.C.
- apply ice packs to the area of the injury;
- seek medical aid urgently.

► Infection Control

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

2.1 describe Infection Control;
2.2 explain individual responsibilities in relation to Infection Control;
2.3 define Standard and Additional Precautions;
2.4 describe protective attire;
2.5 demonstrate a routine hand wash;
2.6 state what is his/her responsibility following exposure to blood (or body fluids contaminated with blood) or needle-stick/'sharps' injury;
2.7 describe the management of blood and body substance spills;
2.8 describe the care or disposal of gloves and other equipment which comes in contact with a casualty.

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 between first aiders and casualties and other potential sources of infection.

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 member;
   - 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 and or outcomes 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 bodies;
- previous immunisations or lack of immunisation.

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 (symbiosis);
- 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:

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

(d) Vectorborne transmission: diseases transmitted by insects including mosquitoes.

The National Health and Medical Research Council (1996) advocates a two-tiered system of precautions based on the mode of disease transmission. 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 preceding and following casualty contact;
- utilisation of protective barriers that may incorporate gloves, eyewear, masks and plastic aprons;
- suitable handling and disposal of 'sharps' and other infectious or contaminated waste;
- utilisation of aseptic/no touch techniques.

Additional precautions are implemented when a casualty is known or is suspected to be infected with organisms that can cause infection and where the infection risk may not be controlled by the use of Standard Precautions (National Health and Medical Research Council, 1996).

Protective Immunisation

On joining the Operations Branch, members should ensure that they have been appropriately vaccinated. This includes tetanus, diphtheria and hepatitis B virus (Faoagali & Pearn, 1996).

In preparation for duty, members should check that their first aid kits are complete with appropriate items, non-damaged, sealed and, where appropriate, within expiry dates. Of importance are disposable gloves, protective eyewear and 'sharps' containers.

Members should be well groomed and their uniforms should be clean and in accordance with dress regulations. Members acknowledging the Principles of Disease Transmission ensure their hands are washed frequently during the duty, irrespective of casualty contact, and take care with what they touch between hand washings.

Routine Hand Wash

- ensure all skin surfaces are accessible; remove rings and watches;
- ensure nails are clean, short and unvarnished;
- wet hands thoroughly;
- a neutral pH soap or skin cleanser should be used:
    - if liquid soap is dispensed from reusable containers, these must be cleaned when empty and dried prior to refilling with fresh soap;
- hands should then be lathered and vigorously rubbed together for at least fifteen seconds, paying attention to all areas of both hands, particularly the finger tips, interdigital areas, thumbs and wrists;
    - scrub brushes should not be used as their use may result in abrasion of the skin, and they may be a source of infection (National Health and Medical Research Council, 1996);
- rinse under a moderate stream of water;
- thoroughly dry hands with paper towel or disposable cloth;
- to minimise chapping of the skin, pat hands dry rather rub them:
    - if cloth towels are used, a fresh towel must be used each time;
    - if a roller towel is used, a fresh portion of the towel should be used;
    - mechanical or electric hand dryers should not be used as these may disperse micro-organisms;
- if elbow operated taps are not being used, whilst still holding the towel, use it to turn off the tap (South Australian Health Commission, 1992).

Emergency Hand Wash

In some situations, members may not have the time nor the resources to carry out a routine hand wash. When these situations occur, an alcoholic wipe or alcoholic-chlorhexidine preparation (e.g. Convatec's Hexifoam, Technical Advisory Committee, 1986) should be used. Gloves should also be used.

Protective Attire

The member responding to an incident should consider the use of protective attire. This may include gloves and eyewear.

Gloves should be worn when:

- there is casualty contact;
- there is likely contact with blood, non-intact skin, wounds or mucous membranes;
- there is an aseptic procedure to be undertaken (if sterile gloves are not available, ensure the technique used is no touch or minimum touch);
- there are emergency resuscitation procedures;
- there are casualty suctioning procedures;
- there is disposal of blood or body fluids;
- it is impractical for a member to wash his/her hands (but gloves must not take the place of hand washing);
- general purpose cleaning is to be undertaken.

Members should wash their hands between casualty contact and after gloves are removed. Gloves provide a barrier preventing the wearer from possible exposure to microorganisms and may protect the casualty from organisms on the hands of the member. Gloves which have been used for casualty management must never be used when other materials, e.g. pens and notepaper, are handled.

Eyewear protects members' eyes from contamination with blood splash or spray (South Australian Health Commission, 1992).

Management of waste

The following items are classified as general waste:

- paper, metal, unbroken glass and plastic materials;
- kitchen waste;
- dressings/bandages;
- materials stained with or having had contact with blood or body substances;
- containers **emptied** of blood or other body substances (rinsing is unnecessary);
- disposable nappies, sanitary napkins and incontinence sheets.

General waste may be placed in a black or white container (this may be a strong plastic bag) and may be disposed of by using domestic facilities.

It may be impractical, because of environmental restrictions, to dispose of contaminated dressings, swabs and bandages at the time of use. It is recommended that contaminated items be initially placed in a self sealing plastic bag and then placed in a container for general waste disposal at the earliest opportunity.

If there are vessels containing blood or body fluids, they can be emptied into a sluice, using safe work practices to avoid splashing onto mucous membranes or broken skin. **Members should utilise appropriate personal protective attire that may include gloves, plastic aprons, eyewear and masks.**

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, which is kept in their first aid kits. When containers are approximately 70 per cent full, they should be sealed and forwarded to a hospital or medical centre for final disposal.

Management of spills

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

With all spills management protocols, it is essential that the area is left clean and dry (National Health and Research Council, 1996). In patient 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 (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).

Members undertaking routine cleaning within a medical centre, casualty room, first aid unit or caravan should use cleaning procedures that minimise dispersal of microorganisms in the air. Routine surface cleaning with detergent and water should be undertaken before and after each duty or when the surface is visibly soiled (National Health and Medical Research Council, 1996).

Irrespective of the size of the spill and area requiring cleaning, members must wear protective attire that consists of gloves, protective eyewear and a plastic apron.

If members are exposed to blood (including body fluids contaminated with blood) or have a needle stick injury, they 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 evaluated and the risk assessed by a medical officer or trained health care worker;
- **Documentation** - the member will document the incident.

References:

Faogali, J. and Pearn, J. H. (1996). 'Immunisation for first aiders, paramedics and other health professionals' in: Pearn, J. H., ed. in chief, *Science of First Aid*, Canberra, St John Ambulance Australia, pp. 300-306.

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Defibrillators in the Community
- an Emerging Role for the Operations Branch

Whilst a cardiac arrest case may be a once-in-a-lifetime event for an individual first aider, in excess of 3,000 persons will die suddenly and unexpectedly outside of hospitals throughout Australia this year, with about 20 per cent of incidents occurring in a public setting. Operations Branch members will be called upon to attempt resuscitation of many of these casualties. This module deals with the increasing presence of portable defibrillators in the community and at Operations Branch duties and the rationale behind their use.

Mechanism of Sudden Death

The vast majority of casualties dying suddenly and unexpectedly in the community do so from a cardiac related cause. Commonly, this is due to an acute myocardial infarction. As a result, a portion of heart muscle becomes deprived of an effective blood supply. About half of all casualties who die as a result of acute myocardial infarction do so before reaching hospital, with ventricular fibrillation being the predominant mechanism.

An Historical Perspective

Ventricular fibrillation as a terminal cardiac rhythm was first described by Karl Ludwig in 1850. It took more than eighty years between this observation and the recognition that a normal heart rhythm could be restored by the delivery of an electric charge to the heart. The first successful defibrillation of a human heart was performed in 1947. A 14 year old boy was having surgery to correct a severe congenital funnel chest. During closure the pulse suddenly stopped. The chest was reopened and manual heart massage performed. A defibrillator was finally summoned and, after two shocks, the fibrillation was wiped out and a pulse restored. The child made a full recovery with no neurological damage. Following this experience, increasing use of defibrillators was made within the hospital setting. During the 1960's, defibrillators were designed that used DC rather than AC power and therefore became portable. This made defibrillation available in the pre-hospital setting.

The Chain of Survival

The ability to defibrillate the heart and restore normal cardiac rhythm and function has become increasingly recognised as an important link in the 'Chain of Survival'. In all, there are four links to the chain; early recognition of cardiac arrest, the performance of C.P.R., early access to defibrillation, and the provision of advanced life support. There is a wealth of evidence supporting the importance of each link. Early recognition of cardiac arrest is clearly pivotal to survival, as indicated by the much higher rate of survival for witnessed as compared to unwitnessed cardiac arrests. Once the cardiac arrest is recognised, it needs to be managed in some way. Whilst the provision of bystander C.P.R. will result in the survival of about 30 per cent of cardiac arrest cases, early access to defibrillation (within 8 minutes) will increase this figure to 50 per cent. However, even earlier access to defibrillation has revealed survival rates of about 70 per cent.

Whilst ambulance officers are often able to provide defibrillation efficiently to casualties in their own homes, it is clearly not possible for an ambulance transport service to deliver defibrillation routinely to casualties at large public venues within 8 minutes of cardiac arrest, particularly where the casualty may be remote from vehicle access. This is further evidenced by data from New York City where, despite ambulances being equipped with defibrillators, the survival rate for cardiac arrest victims is 1.5 per cent, due to the time required to access high rise dwellings. The key to improving survival rates from cardiac arrest is time. As the time taken to deliver each link in the chain is reduced, so there is a corresponding increase in the survival rate. This is clearly demonstrated in the coronary care unit. These units were specifically designed to enable the earliest possible detection of the onset of ventricular fibrillation. With immediate recognition and delivery of defibrillation, survival rates approach 100 per cent.

Semi-automated External Defibrillators (Shock Advisory 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 guess-work 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. These devices are variably referred to as AED's (automated external defibrillators) or SAED's (semi-automated or shock advisory external defibrillators), all terms referring to the same devices.

Safety in Defibrillation

With the availability of semi-automated defibrillation at some public first aid duties, the Operations Branch member should be aware of some of the personal safety considerations when working alongside such defibrillators. The energy delivered by SAED's is dangerous. At all times members should ensure that their personal safety and that of bystanders is maintained.

- At all times follow the instructions of the operator of the SAED.
- C.P.R. should be continued until instructed to stop by the operator of the SAED.
- On the order 'Stand clear', members should ensure that they are not touching the casualty, the casualty's clothing or any other equipment associated with the casualty.
- Ensure that there is no water on the casualty or between the casualty and the operator or bystander. Remove all oxygen equipment.
- The Operations Branch member should also be aware of any bystanders who may need to be removed from near the casualty.

Defibrillation by Operations Branch Personnel

A relatively small number of defibrillators have 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.

Reference:

John Pearn Ed., *The Science of First Aid*, St John Ambulance Australia, 1996, chapter by William Griggs, pp. 89-98.

► The Gastro-Intestinal System

REFERENCES: St John Ambulance Australia (1998). *Australian First Aid*, reprinted annually, Chapter 7.
Tortora and Grabowski, *Principles of Anatomy and Physiology*, 7th edition.

OBJECTIVES:

4.1 Describe the organs of the gastro-intestinal (GI) tract.
4.2 Apply knowledge of the gastro-intestinal (GI) tract when assessing the abdomen in a variety of first aid settings.

Food is vital for life because it is the source of energy that drives the chemical reactions occurring in body cells. It also provides matter that is used to form new tissues or to repair damaged tissues. However, when food is consumed it is not in a state suitable for use as an energy force. It must be broken down into molecules small enough to cross into the cells. The conversion or breaking down of food into molecules small enough to enter the body cells is called digestion and the organs that collectively perform this function are known as the digestive system.

The organs of digestion are divided into two groups. The first is the gastro-intestinal (GI) tract or alimentary canal, the main concern of this module. The second group of organs is the accessory structures - namely the teeth, tongue, salivary glands, liver, gall bladder and pancreas.

Food enters the GI tract through the mouth where chewing breaks it into small pieces. These are mixed with saliva which contains a chemical that begins the digestive process. Food is then swallowed. It passes down the oesophagus (gullet) into the stomach. The oesophagus is a muscular tube which connects the back of the throat (pharynx) to the stomach. Its only function is as a connecting tube.

The stomach is a hollow J-shaped organ situated below the diaphragm, under the ribs on the left side of the upper abdomen. The empty stomach is a sac measuring approximately 15-20 cm long and 8-10 cm wide in the average sized adult.

The main function of the stomach is to churn the contents and mix it with acid gastric juices which continue the digestive process. Minerals, water and alcohol are the only materials absorbed directly through the stomach wall.

Food in a semi-liquid form passes from the stomach into the duodenum. The duodenum, the first part of the small intestine, is 25 cms in length. Cells in the wall of the duodenum produce juices which assist in the digestion of food. Secretions from the gall bladder and pancreas drain into the duodenum and assist in the digestion of food.

The small intestine is that part of the intestinal tract extending from the duodenum to the large intestine. The junction of the two is in the right lower quadrant, very close to the appendix. The small intestine is approximately 6 metres long.

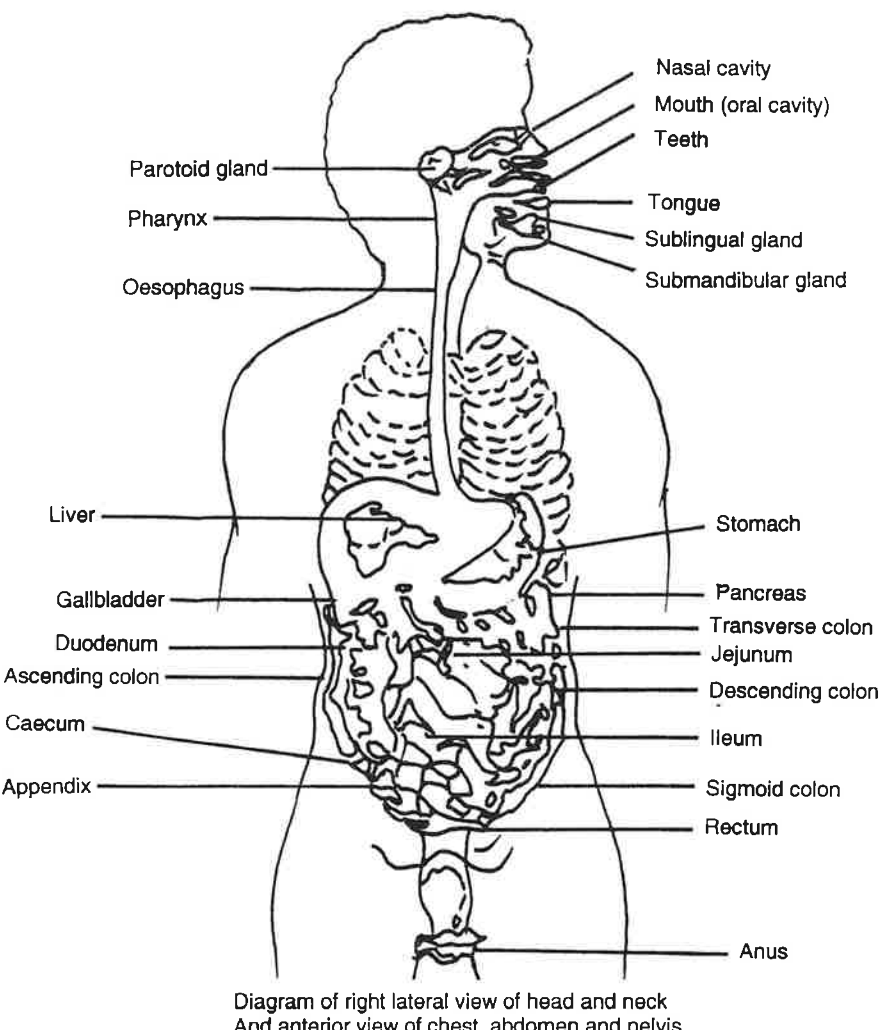

Fig. 4.1 Organs of the digestive system and related structures.

Certain chemicals (enzymes) are secreted by the small intestine. These break down various foods which enable absorption of some water, soluble carbohydrates, fats, proteins and essential chemical elements - namely sodium, potassium, chloride, phosphorous, calcium and iron - through the vast surface of the small intestine.

These basic components (molecules) enter the lymphatic system and blood stream reaching the liver where the molecules are further altered for eventual use by the body tissues.

Food is now reduced to a fluid form with some solid material. This passes into the large intestine and to the anal orifice (anus).

The large intestine is approximately 1.5-2 metres long.

The chief functions of the large intestine are:

- completion of absorption chiefly water;
- absorption of certain vitamins;
- the formation of faeces; and
- the expulsion of faeces from the body by defecation.

NOTE: **Assessment** is included in the assessment of Module 5 on Abdominal Emergencies.

Abdominal Emergencies

REFERENCES:

St John Ambulance Australia (1998). *Australian First Aid*, reprinted annually, Chapter 7.
St John Ambulance Australia (1997). *Occupational First Aid*, Chapter 14.
Tortara and Grabowski. *Principles of Anatomy and Physiology*, 7th edition.

OBJECTIVES:

On the completion of the training period and after practising the appropriate skills, the member will be able to:

5.1 demonstrate, using a model, the location of the main organs of the abdomen and pelvis;
5.2 demonstrate, using a model, the regions and quadrants of the abdomen and pelvis;
5.3 recognise the symptoms and signs of an acute abdomen;
5.4 provide appropriate emergency management for the individual with an acute abdomen.

PRACTICAL SKILLS

5.1 demonstrate appropriate physical assessment skills (including abdominal palpation) of an individual with abdominal pain;
5.2 demonstrate positioning a casualty either supine or laterally with knees flexed;
5.3 demonstrate wound dressing technique to cover any exposed organ/s using sterile (moist, warm) dressing;
5.4 demonstrate monitoring of vital signs.

Introduction

Abdominal pain is a common complaint presenting to the first aider and medical practitioner alike, and yet is one of the most challenging conditions to diagnose and treat. Field assessment is a difficult task at the best of times and you are unlikely to be able to determine the cause of most abdominal pain in this environment. With many different causes of abdominal pain, attempts to diagnose the cause in the pre-hospital setting should be avoided. This is difficult enough in the Emergency Department equipped with a range of diagnostic tools such as pathology and x-rays.

Abdominal Emergencies

Abdominal emergencies can be caused by injury or illness and almost always result in pain.

1. **Abdominal illnesses** frequently have a sudden and dramatic onset, and require rapid assessment and management.

   Common conditions that cause problems are:

   - infections or inflammation of:
     - intestine (gastroenteritis);
     - gall bladder (cholecystitis);
     - appendix (appendicitis).

   - blockages through:
     - adhesions (fibrous bands from previous surgery or injections);
     - stones in the bladder, gall bladder or bile ducts;
     - tumours;
     - hernias*.

   Less common, but more severe, problems are due to rupture of an organ. The casualty will complain of severe pain, and rapidly become shocked. The organs that can rupture include:

   - aorta - through weakening of the wall of the aorta (an aneuryism);
   - duodenum and stomach - through an ulcer extending through the wall of the organ;
   - fallopian tube - through the formation of a pregnancy in the tube (ectopic pregnancy); as the pregnancy grows, the tube stretches and then ruptures.

* A hernia appears as a swelling under the skin, usually in the groin. It is caused when there is a weakness in the muscles of the abdominal wall and a piece of bowel pokes through this weakness.

2. **Abdominal injuries**

   They may be classified as penetrating or blunt trauma depending on the causative agent. Vehicle accidents, sporting injuries, falls, stab wounds and knife wounds are all causes of abdominal trauma.

Assessment of Abdominal Emergencies

1. **D.R.A.B.C.**

2. **History**

   Take an AMPLE History

A	**Allergies**
M	**Medications**
P	**Past Medical History**
L	**Last Meal**
E	**Events leading to illness or injury**

Allergies

- Does the casualty have any allergies (medicine, food, insect)?

Medications

- Is the casualty taking any medications? Note any recent changes to medication.

Past medical history

- Has the casualty any history of illness, or surgery?
- Is it possible that the casualty is pregnant?

Last meal

- When did the casualty last eat?
- Note any changes in normal eating habits.
- Has the casualty lost weight recently?

Events leading to illness or injury

- What was the casualty doing immediately prior to the onset of the condition?
- If the casualty has been injured, how exactly did the injury happen?

3. **Symptoms**

Abdominal symptoms can include:

- Pain
  Ask about :
  - location;
  - radiation;
  - intensity;
  - timing (constant or intermittent).

  Intermittent or colicky pain may indicate obstruction.
  - what makes it better or worse?

- Nausea and/or vomiting
  A blockage to the intestine usually causes copious vomiting.
  Always observe the nature of the vomited material:
  - colour, amount, odour.

- Diarrhoea
  This is usually associated with inflammatory processes such as gastroenteritis. Note the colour of the bowel motions.

- Bleeding
  The casualty may complain of bleeding from the bowel, bladder or vagina.

4. **Signs**

- Observe the casualty as a whole:
  - check vital signs :
    > colour;
    > warmth of skin;
    > pulse;
    > respiratory rate.
  - observe the casualty for anxiety or expressions of pain.
  - note the position the casualty is in, e.g. on the side, hunched over.

- Observe the casualty's abdomen and look for:
  - wounds, abrasions, bruising; inspect the back as well;
  - protrusion of intestinal contents; (this is very rare);
  - bloating of the abdomen (usually a sign of obstruction);
  - a lump in the groin (may be a hernia).

- Feel the abdomen, noting any tenderness, rigidity or other abnormality.

For practical purposes, we divide the abdominal cavity into four quadrants with the intersection at the umbilicus (see Fig. 5.1)

Lie the casualty down, with the knees bent.

With the flat of you hand, very gently feel in all four quadrants of the abdomen.

Normally the abdominal wall is soft. If there is inflammation or infection present the abdominal wall is rigid and board-like, guarding the inflamed interior from painful movement. The casualty will complain of tenderness if you touch an inflamed area.

When examining the casualty, maintain decorum, (if possible with witness present of the same sex as the casualty) and ensure that you record the pulse, temperature and the findings.

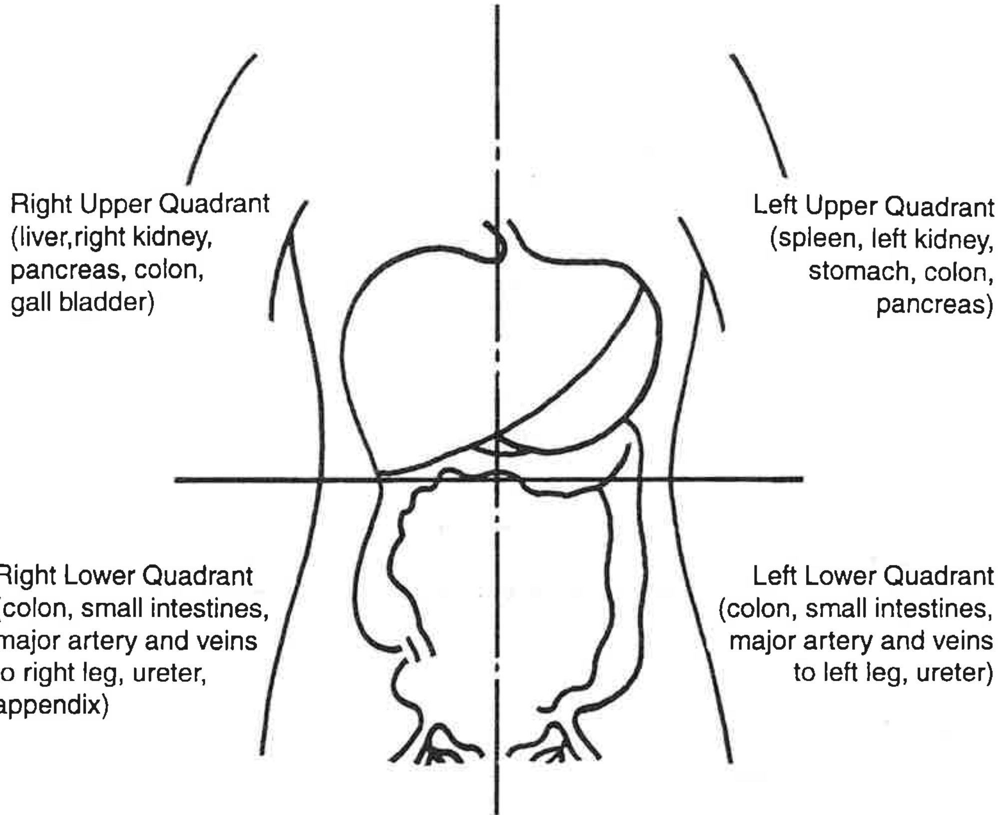

Fig. 5.1 Quadrants of the Abdominal Cavity

Management

- Place the casualty in a comfortable position, lying on the back with the head and shoulders slightly raised and the knees slightly flexed. This can be achieved by placing a folded blanket or pillow under the shoulders and the knees. Positioning the casualty in this way will help to relax the abdominal wall and reduce pain.

- Reassure the casualty and loosen all tight clothing.

- Give nothing by mouth.

- If there is a wound, manage as such. Cover any exposed organs with sterile moist non-adherent dressing, plastic film or plastic bag to reduce evaporation or contamination.

- Oxygen therapy should be given if available.

- Treat for shock.

- Continue to monitor vital signs and pain levels.

- Record all observations.

- Medical aid must be sought urgently as, apart from treating for shock, there is little more that the first aider can do under these circumstances.

The "Do Nots"

- Do not attempt to replace the organs in the abdomen.

- Do not remove foreign bodies embedded in the abdominal wall; use ring pads, bulk dressings and supportive bandages.

5.1 Manage a casualty with abdominal pain

Scenario

You are a first aider on duty at a U2 Pop Concert. A group of young girls approach you and tell you that one of them is not well. The casualty is in her early teens and appears flushed and is perspiring. She is crying and holding her stomach. Her friends tell you she vomited on the way to the concert.
- What is your assessment?
- List the questions you would ask the casualty.
- List two questions you would ask the group.
- Complete the OB12 including your advice to the casualty.

Checklist	Needs Improvement Date	Proficient Date
- Ask the casualty's name and use it. Identify yourself. - D.R.A.B.C. - Reassure the casualty. - Wash and dry hands, put on gloves, explain why to casualty. - Prepare sick bag for vomitus. - Make casualty comfortable - position, lateral/supine with knees flexed. - Obtain medical aid.		
History **A** Allergies **M** Medications **P** Past medical history **L** Last meal time and type **E** Events leading to illness or injury		
Observations - Temperature; - Pulse; - Respiration; - Skin colour/texture; - Ask about pain (what casualty feels, not what you observe).		
Examination - Consent of casualty; - Witness; - Examine abdomen; - Remove gloves; - Wash hands and dry them.		
Treatment of Wound/s - Change gloves, wash hands in between examination and wound dressing procedure. - Cover any exposed organs with sterile, moist non-adherent dressing or plastic film. - Dispose of used dressings/gloves as per Infection Control Procedures.		
Documentation - Complete OB12.		

Possible questions for the group

1. What did the vomitus look like?
2. How long ago did your friend vomit?
3. Was it only once?
4. When did you meet your friend and was she O.K. then?
5. Have you all had a meal together on the way to the concert?
6. Did you all eat the same thing?
7. Is anyone else unwell?
8. Does your friend frequently/infrequently vomit?

Sporting Injuries

OBJECTIVES:

On completion of this period of training and education, the member will be able to:

6.1 Describe the influence of the following factors during exercise:
- gender differences;
- muscle performance;
- energy and oxygen consumption;
- respiratory system;
- effect on heart performance and blood flow;
- sweating and heat production.

6.2 Demonstrate the safe and effective application of first aid to an ankle sprain, including:
- safe application of an ice pack;
- safe application of a pressure bandage following ice application.

6.3 Describe the problems encountered by athletes with heat exhaustion and how they can be managed:
- fluid loss;
- fever;
- low blood sugar;
- muscle cramp.

A. Endurance Sporting Events

The Physiology of Exercise

Any discussion of illness caused by or related to endurance sporting events requires an appreciation of the changes to body functions during exercise. Several factors need to be considered including:
- body composition differences between male and female athletes;
- muscular function;
- energy and oxygen consumption;
- respiratory system effects;
- effect on heart performance and blood flow;
- sweating and heat production.

Males and females

The same changes of body function occur for men and women. There are, however, differences in body size, composition and the presence of the male sex hormone, testosterone, that affect the quantity of performance. In women, measures of function related to muscle strength, cardiac output and respiration are approximately two-thirds to three-quarters those of men. However, the actual athletic performance is not affected to the same degree owing to the generally small body stature. Nonetheless, differences in athletic performance between men and women are related to sex hormone effects.

Testosterone is the male sex hormone produced in the testes. It increases protein deposition in the body tissues, especially in muscle. Testosterone-like drugs are called anabolic steroids.

Oestrogen is the female sex hormone, produced mainly from the ovaries, although some female sex hormone is produced in both males and females from the adrenal glands located just above the kidneys. The quality of its effect is much less than testosterone. Its main noticeable effect on body shape is the accumulation of fat in general throughout the whole of the body but more specifically the breasts, hips and beneath the skin.

At the onset of puberty, both males and females experience a growth spurt. In the female, this growth spurt is short-lived and the growing areas of long bones close some two or three years earlier than in the male counterpart. In general, this results in a shorter stature.

The non-athletic female of normal weight for height has a fat content of approximately 26 per cent while the male counterpart is 45-50 per cent leaner with a fat content of approximately 15 per cent. The trained endurance athlete's fat content is about 6-8 per cent for females and 4 per cent for males.

Muscular performance

The five factors that dictate quality and quantity of muscular performance are:

1. strength;
2. power;
3. endurance;
4. muscular length;
5. coordination.

Muscular strength is related to muscle size. The two main factors in increasing muscular size are the effect of testosterone as detailed above and an exercise training programme. Muscular size increases progressively with a graduated programme. The increased demand enhances the accumulation of protein within a muscle cell which is then converted into contractile tissue. The following lay person's description is relevant: "the flabby muscle is firstly toned, then gains bulk and definition."

Muscular power is the amount of work that a muscle can perform in a period of time. It is a physical function related to muscle strength, the speed of muscular contraction and the number of muscle contractions per minute.

Muscle endurance is the length of time that an activity can be sustained. Although strength and power are important, it is related to the amount of energy that can be produced by the breakdown of glycogen stored within the muscle and the ongoing availability of nutrients.

Glycogen is the compound that glucose particles are converted into following absorption from the small intestine. It is present in both muscle and liver and is dependent on the action of insulin for its accumulation. Increased carbohydrate intake in the days before an athletic endurance event increases the body's stores of glycogen. This is termed carbohydrate loading.

Nutrients - oxygen debt

Athletic activity can be performed by utilisation of glucose without oxygen. The length of time that this can be sustained is short as the waste products produced result in muscular fatigue once a build-up has occurred. Muscular function can occur with this process for up to say a 200-300 metre race. However, oxygen and nutrients will be needed for the recovery of the muscle and replacement of its energy stores.

Oxygen and glucose are the main energy-providing compounds for the maintenance of muscular performance in endurance events. In simple terms, oxygen is required for the efficient breakdown of glucose in order to produce large quantities of adenosine tri-phosphate, the energy compound which initiates muscular contraction.

Oxygen is stored in the various areas of the body:

- approximately 300 mls are stored in muscles;
- a litre is attached to haemoglobin;
- 500 mls sits in the area of the lungs; and
- 250 mls are dissolved in the body fluids.

Most of this oxygen is used during exercise and needs to be replenished later.

Oxygen is also required to replenish the energy systems and deal with the waste products that are produced by muscular activity without oxygen at the initial commencement of athletic activity. The quantity of oxygen required at the conclusion of exercise is termed oxygen debt and is needed to replenish energy stores. It can be as much as 10-15 litres of oxygen (the oxygen content of 50-70 litres of air) and take up to two hours following strenuous activity.

The nutrients that are used as energy sources are:

- glycogen which is stored in muscles and liver and is converted into glucose;
- fat broken down into fatty acids and ketones and then used as substrates for energy production;
- amino acids which are the components that form proteins.

In an appropriately prepared athlete, glycogen stores can last for about 4 hours; after that time glucose is obtained by absorption from the intestine. A glucose solution of approximately 2-2.5 per cent taken frequently during an endurance event can provide 30-40 per cent of the energy required for that event. After the first 4 hours, 50 per cent of the energy required can be obtained from fat.

Respiration

The normal oxygen gas requirement for an average person at rest is approximately 250 mls per minute. During exercise:

- the untrained average male, for height and weight, utilises 3.6 litres per minute;
- the trained male is able to utilise 4 litres; and
- the trained endurance event athlete utilises 5.1 litres per minute.

The maximum volume of air that is breathed during exercise is approximately 100-110 litres per minute.

However, this is much less than the maximum breathing that the body can achieve which is 150-170 litres per minute. Therefore, it is not the respiratory system that limits the maximally achievable athletic performance.

Effects of smoking on lung function

Smoking is detrimental. The nicotine contained in cigarette smoke has several effects which impair lung function:

- It causes spasm and narrowing of the smaller airways, thus making it more difficult to move air in and out.

- Nicotine produces increased secretion of mucus due to direct chemical irritation of the mucous membrane lining of the airways.

- It creates inflammation of the airway linings, further narrowing them.

- It impairs the activity of the small hair fibres of the larger airway cells (cilia) which form a microscopic carpet. Under normal circumstances these beat to produce a wave of activity, like a field of waving wheat, which moves dust particles and mucus towards the upper airway for elimination. We normally do not appreciate this function but in some instances, for example during a mild infection such as bronchitis, we are conscious of this action as we cough or clear our throat which is then followed by swallowing or expectoration (coughing up) of sputum (mucus).

Heart action and blood flow

Muscle blood flow is markedly increased during exercise. The normal blood flow is approximately 3.6 mls per 100 grams of muscle tissue. In strenuous activity it is increased to 90 mls per 100 grams of tissue, a 25 fold rise. Arterial blood pressure tends to rise by up to 30 per cent and contributes to increased muscle blood flow.

The heart normally pumps 5 to 5.5 litres of blood per minute in an average healthy adult male. During exercise, it rises to about 23 litres per minute. In the conditioned endurance event athlete, outputs of 30 litres per minute or six times the resting flow can be achieved.

Training and conditioning can increase heart chamber size and muscle mass by 40 per cent. In exercise, both rate and stroke volume - the volume ejected from the heart with each beat - is increased to 95 per cent of maximum function.

Exercise is the most strenuous activity that one can place on the heart.

Body heat, fluids and salt

Almost all of the energy released during the processing of the nutrients by various chemical reactions is converted into heat. Only 20-25 per cent of the total energy produced is utilised in muscular work. Oxygen consumption, as previously mentioned, can be increased 20 fold and the heat production is directly proportional to that oxygen consumption. One can then appreciate the quantity of heat that is produced in the body's tissues during endurance activity.

Sweating is the mechanism by which the body cools down. In a cool and dry environment with a breeze this is efficient. However, on a hot humid day, this mechanism becomes less efficient. Under these circumstances, the person may become heat affected or develop a heat exhaustion illness. Efficient sweating can result in a loss of 2-3 litres (1 litre = 1 kilogram weight) of fluid and thus body weight during each hour of an endurance event. A 3 per cent loss of body weight can decrease performance and a 10 per cent loss can lead to nausea, muscular cramps and other effects. As body temperature rises above a certain level, sweating ceases and body temperature continues to rise with the development of heat stroke.

The type of fluid replacement and its salt content has been clarified over the years. A relatively untrained competitor loses significant amounts of salt (sodium chloride) in sweat. The concentration of salt in sweat of the 'unacclimatised' person approaches two-fifths that of normal saline (normal saline is a solution of 9 grams of sodium chloride salt in a litre of water). In other words, two-fifths of this sweat loss is equivalent to this salt solution; the remaining three-fifths is water.

An athlete who is trained for endurance events becomes 'acclimatised' and the salt loss in sweat is one-sixth that of the unacclimatised athlete. Thus, fluid replacement of the relatively untrained competitor needs a quantity of sodium chloride whereas the endurance athlete may only require a glucose solution. Unfortunately, salt-containing solutions can cause abdominal discomfort and vomiting and affect performance. Potassium loss has been identified as a further significant problem; therefore, potassium is now in fluid replacement solutions.

Group discussion

Discuss how training improves endurance and fitness.

B. Soft Tissue Injuries from Sporting Events

The effective treatment of acute soft tissue injury requires prompt assessment of the injury followed by the commencement of the R.I.C.E. programme.

Common injuries:

- bruises (bleeding into the soft tissue and muscles);
- ligament sprains and tears;
- muscular and tendon strains and tears;
- joint injuries;
- over-use injuries, e.g. ligaments, joint or tendon inflammation;
- fractures including stress fractures.

Both sprains and strains are over-stretching injuries. 'Sprains' involve ligaments and joints. 'Strains' relate to muscle and tendons. Muscular and ligament tears may be partial or complete.

Mechanisms

Most sports injuries are the result of a direct blow producing bruising (or contusion) or indirect dynamic force resulting in sprains, strains and tears. An increasing number of injuries are the consequence of overuse activities, e.g. joint, bony or tendon pain, such as seen following excessive participation in aerobic exercise sessions.

Prevention:

- Appropriate warm up and cool down activities.
- Proper stretching and flexibility work.
- In some cases, protective strapping, e.g. ankle.
- Being physically fit to perform a particular sport. This requires general fitness and special skills training, e.g. football or soccer.
- Adequate balanced diet. This reduces the need for dietary supplements.

Treatment

Once injury has occurred, the R.I.C.E. programme must be started.

R Rest. The injured soft tissues must initially be rested to decrease haemorrhage and swelling. Subsequently, a period of rest allows healing. However, this time is dependent upon the site of the injury and its severity.

I Ice is applied for fifteen minutes initially. It must not be applied directly on the skin. Direct application to the skin will harm it. Crushed ice should be wrapped in a wet towel or placed in a cotton bag prior to its application. The ice pack is applied around the affected joint or muscle. A bandage may be needed to retain the position of the pack.

Crushed ice is cheap, effective, easily prepared but messy. Manufactured 'cold packs' are very effective but costly. Some 'cold packs' can be applied directly to the skin and some cannot. It is important that the manufacturer's instructions are followed. Frozen food in a plastic bag, e.g. peas, is also an effective substitute. However, once thawed, the contents must be cooked or discarded.

C Compression from a moderately firm bandage controls swelling.

E Elevation of the injured part helps drainage and controls swelling.

Harm factors must be avoided:

H Heat increases bleeding and swelling.

A Alcohol increases bleeding and swelling.

R Running or exercise too soon causes further injury.

M Massage in the first 24 to 48 hours increases swelling and bleeding.

If a **fracture** is suspected, the injury should be treated as such and referred for a medical opinion as soon as possible.

Dislocations should have ice packs applied over or around them, be splinted in a comfortable position and be immediately referred to an emergency department or a medical practitioner for assessment and continuing care. **No reduction is to be attempted by a first aider**. There may be a fracture associated with the injury which could affect the reduction and compromise the final result if managed inappropriately.

Continuing care of soft tissue injury in general

Following the initial treatment, every two hours, while awake, for the first twenty four hours, apply an ice pack to the injured area over the compression bandage for twenty minutes, still keeping the injury elevated. Perform ice application at least four times a day on the second day.

It is recommended that a medical practitioner or a physiotherapist should see the injured competitor for follow up no later than 48 hours after the injury.

Return to activity

No competitor should participate in a sporting event while an injury remains painful. Pain implies incomplete healing and potential further aggravation of an existing injury. A safe return to sporting activity requires:

- the injury to be completely healed.
- as appropriate, the participation in a rehabilitation programme designed to regain strength, balance, mobility and coordination of muscle or joint activity. This should be coordinated by a physiotherapist in consultation with a medical practitioner.

Practical Skill

6.1 Treat a soft tissue injury to an ankle

Checklist	Needs Improvement Date	Proficient Date
Preparation and application of an ice pack		
Sit or lie the casualty down.		
Take a history.		
Soak a dressing in cold water; use a small hand towel if the area is large.		
Lightly wring out the dressing.		
Place a quantity of chipped ice in the centre of the dressing. (Proprietary ice packs are excellent. The manufacturer's directions must be followed. They are more expensive than ice.)		
Fold the edges of the dressing so that the ice chips are contained.		
Place the ice pack on the area requiring treatment; maximum application time is 15 minutes in any one treatment.		
Apply firm pressure to the ice pack on the part without compromising circulation; casualty to apply pressure if practicable, or secure with a conforming bandage.		
Elevate the injured part.		
Apply a pressure bandage to the area after the ice pack is removed.		
Ensure that circulation is not restricted.		
Complete an OB12 Casualty Report form.		

Ongoing treatment: The ice pack should be re-applied every 2 hours for a further 24 hours and then every 4 hours for a further 24 hours.

C. Heat Exhaustion in Athletes

A wide spectrum of injury and medical problems can occur in any runner in any sporting event. However, with endurance or distance events, a particular problem is exertion-induced heat exhaustion. Bear in mind that the 'fun runner', as opposed to the professional or serious amateur, is one who tends to train in the cool of the day and is not conditioned for competition. Heat affected individuals are those runners who collapse with an initial central body (core) temperature, as measured with a rectal thermometer, of 38.5 degrees or higher.

Heat exhaustion, as induced by the exertion of running, covers a range of situations from simple heat exhaustion to heat stroke.

Our previous discussion reviewed the way the body physiology alters with the stress of exercise. From this we can understand the following problems encountered by competitors at endurance events such as fun runs and marathons.

1. Fluid loss

This can be considerable and must be replaced. If the casualty is conscious, the safest fluid to be given by mouth initially is water. In the unconscious person, intravenous fluid is required but the type and method of administration is a medical not a first aid issue.

2. Fever

The body temperature can be significantly elevated. A core temperature of greater than 38 degrees constitutes heat illness. In the sports person who has collapsed or just competed, temperatures taken by mouth or axilla are not indicative of the core temperatures. However, first aiders are not permitted to take rectal or tympanic membrane temperatures.

Methods of heat reduction include:
- removal of heat retaining clothing;
- moving the person into the shade; a gentle breeze blowing around the casualty facilitates heat loss; a fan is useful;
- apply ice packs to the groin, arm pits and around the neck.

3. Low blood sugar (hypoglycaemia)

Low blood sugar can be a problem; it is the result of the body having consumed most of its available glucose supply. If the person is conscious, it is best replaced by mouth with a glucose drink. Unfortunately these persons are often either unconscious or have an altered conscious state and therefore cannot be given anything by mouth.

4. Muscle cramps

These are best managed by:
- stretching the affected muscle groups;
- the application of ice packs.

Prevention: "better than cure".

Event timing

Endurance and distance events are best held in the cool of the day, usually commencing in the early morning. The body's ability to cool down is also less efficient when humidity is high.

Training

A recognised running club is geared to the preparation of competitors. Ideally, a potential competitor should seek the assistance of such organisations. Entrants should be conditioned for the event. A sensible graduated training programme as discussed previously is recommended.

Diet

A well balanced diet is most important in the weeks prior to the event.

Fluid intake

500 mls of fluid should be consumed half an hour before the event. During the event, each competitor requires 100-200 mls of fluid to be taken at no more than 20 minute intervals.

The fluid consumed can be water. However, glucose and low concentration salt solutions are used by some competitors. Water and glucose are more important for the properly prepared and trained athlete than salt during the race. The body tolerates and absorbs glucose containing solutions of concentrations less than 2.5 per cent without the runner 'feeling heavy in the stomach' or uncomfortable. More recently, short chain glucose polymers have been developed and are structured to be used in stronger concentrations than an equivalent quantity of glucose in water. These are more easily absorbed and are relatively free of the abdominal discomfort highlighted above.

Who should not compete:

- Persons with muscle or joint injuries that have not completely healed.
- The unconditioned, unfit, untrained or unprepared person.
- Any person who has had a fever or a significant illness within the week prior to the event. This includes the person who has had vomiting or diarrohea in the two days prior to or on the day of the event.

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Larkins, P. (August 1988). 'Exertional Heart Illness.' ASMF Lecture, Prince Henry's Hospital, Melbourne.

Asthma and Respiratory Distress

REFERENCES:

National Asthma Campaign, *First Aid for Asthma.*
St John Ambulance Australia (1998). *Australian First Aid,* reprinted annually, Chapter 19.

AIM:

To enable the member to recognise and administer appropriate first aid for respiratory distress, and particularly asthma.

OBJECTIVES:

On completion of the training session, the member will:

7.1 have a more detailed knowledge of causes of respiratory distress.
7.2 demonstrate an understanding of asthma and its triggers.
7.3 outline the signs and symptoms of respiratory distress.
7.4 demonstrate some familiarity with the treatment devices casualties may use for their asthma.

Review of the Respiratory System

The lungs are two large organs which occupy most of the chest cavity. They allow exchange of oxygen and carbon dioxide, when air is drawn into lungs through the major airways.

The lungs themselves contain only a little muscle, which is not under voluntary control and which lines the walls of small airways in the lungs. This muscle is responsible for adjusting the width of airways, but is not responsible for the movement of air in and out of lungs. This occurs as a result of contraction and relaxation of the diaphragm and chest wall muscles.

The respiratory system comprises four major parts:

(a) Brain and spinal cord - the controlling computer and the wires.

(b) Chest wall and diaphragm - the components responsible for moving air in and out.

(c) Airways - beginning at the mouth/nose and gradually dividing and diminishing in size.

(d) Lung tissue - responsible for exchanging oxygen for carbon dioxide in the blood stream.

Respiratory Compromise

Disease can affect any one of the main components described above, e.g:

Brain and spinal cord	- trauma; - degenerative diseases.
Chest wall	- trauma.
Airways	- obstruction by foreign body; - blood; - swelling in the throat; - decreased conscious state; - asthma (in the small peripheral airways).
Lung	- pneumonia; - smoke inhalation.

In most of these disease states, the body compensates for decreased respiratory function by:
- increasing respiratory effort (if possible), i.e. use of extra muscular effort;
- increasing respiratory rate;
- increasing pulse rate.

Asthma

Asthma is a very common disease in our community and (for reasons we do not yet know) is becoming more common. It probably affects about 5 per cent of adults.

The lungs of asthmatics react in an over-sensitive manner to a range of stimulants. These 'triggers' may differ from person to person. Triggers may include emotional, exercise-related, allergic, infectious, pharmacological, occupational and environmental factors, but whatever the trigger is, the end result is the same.

The airways respond to a trigger by producing excess mucus, swelling and broncho-constriction (i.e. the muscles in small airways tighten up and decrease the airway size). These three responses all decrease the size of the smallest airways and limit the amount of airflow into the lungs. Air whistling through narrowed airways produces the characteristic wheeze of asthma.

History	- previous asthma attacks; - any known triggers; - previous hospital admissions - especially if to intensive care unit (I.C.U.)
Symptoms	- shortness of breath; - cough; - tight feeling in chest.
Signs	- difficulty speaking; - audible wheeze; - increased respiratory effort; - increased respiratory rate and pulse rate; - with very severe asthma, cyanosis (blue tinge to lips and tongue) decreased conscious state, and minimal air movement.

Most asthmatics will know they have asthma and have a management plan instituted by their local doctor. It usually involves using preventers (drugs used to help prevent attacks) and relievers (drugs used to help once an attack has begun). Many of these medications are given by an inhaler (puffer) - a small pressure canister which releases the medication into the mouth when the plunger is pushed down. Sometimes this is used in conjunction with a 'spacer' device (see Figures 7.1 and 7.2). Relievers, which are used in the attack, are coloured blue and include Ventolin, Respolin, Bricanyl, Respax and Asmol.

Assessment of Casualty with Asthma

A casualty's respiratory status can be assessed by considering the following features
- position adopted;
- appearance;
- speech (ability and flow);
- sounds of breath (wheeziness, cough);
- respiratory rate and rhythm;
- respiratory effort;
- skin colour;
- pulse;
- conscious state.

These features can be used to assess an attack of asthma as mild, moderate or severe in the following manner:

MILD	MODERATE	SEVERE
Should be reviewed by local doctor	Should be referred to hospital for assessment	Will need admission to hospital
• Cough, soft wheeze, anxious	• Persistent cough, loud wheeze	• Very distressed
• Minor difficulty breathing	• Obvious breathing difficulty	• Gasping for breath
• Speaks clearly in sentences	• Speaks in short sentences only	• Only able to speak a few words in one breath
		• Pale and sweaty, blue lips
• Pulse rate < 100	• Pulse rate 100-120	• Pulse rate > 120

Management of Casualty with Asthma

All casualties suffering from an asthma attack will be lacking oxygen (hypoxia) and will benefit from supplemental oxygen. Many asthmatic casualties will have appropriate medication with them.

Follow the St John Action Plan as in managing any casualty.

1. **D** - Check for danger.
   R - Determine the conscious state of the casualty.
   A - Check, clear, and ensure airway is open.
   B - Check breathing, and assess respiration. Assist as needed.
   C - Check the pulse and assess its rate, rhythm and strength.

2. Sit the casualty comfortably upright. Be calm and reassuring in your approach.

3. Record the respiratory status assessment.
   If the attack is assessed as moderate or severe, **call an ambulance immediately (dial 000)**.

4. Ensure adequate fresh air. If oxygen is available and you are trained in its administration, apply mask and deliver oxygen at 15 lpm.

5. If State/Territory legislation permits and if available, assist with prompt administration of casualty's reliever medication by inhaler. Give 4 puffs initially (Figure 7.2). A spacer should be used if on hand (Figure 7.1).

6. Re-assess at 4 minutes:
   - if the casualty's symptoms have settled, the casualty should be advised to see his/her doctor;
   - if there has been no improvement, and an ambulance has not been already called, call an ambulance (dial 000).

7. While awaiting the ambulance:
   - children can be given a further 4 puffs of reliever medication every 4 minutes;
   - adults may be given 6 to 8 puffs every 5 minutes.

Fig. 7.1 With Spacer

- Shake inhaler and insert mouthpiece into spacer.
- Place spacer mouthpiece in person's mouth and fire 1 puff.
- Ask the person to breathe in and out normally for about 4 breaths.
- Repeat in quick succession until 4 puffs have been given.

Fig. 7.2 Without Spacer

- Shake inhaler.
- Place mouthpiece in the person's mouth. Fire 1 puff as the person inhales slowly and steadily.
- Ask the person to hold that breath for 4 seconds, then take 4 normal breaths.
- Repeat until 4 puffs have been given.

8. If the casualty is, or becomes unconscious, follow the D.R.A.B.C. Action Plan and seek medical aid urgently.

9. Legislation varies from district to district. When permitted within a district and the member is appropriately trained, an Operations Branch member may:
   - use a reliever obtained from an alternative legal source (another person or first aid kit);
   - if a casualty is exhibiting difficulty breathing and has not previously had an asthma attack, treat that casualty as if the condition was asthma;
   - administer salbutamol by nebuliser in accordance with the protocol set by the district.

7.1 Treat a casualty with asthma

Scenario

While attending an outdoor barbeque, you notice a teenaged girl sitting by herself. She is struggling for breath. She tells you she is an asthmatic and that she is having an asthma attack. She has recently had the 'flu'. She has her own reliever inhaler with her, with a spacer.

Equipment Required

- Reliever inhaler;
- Spacer.

If required for relevant level of training:

- salbutamol and nebuliser;
- oxygen and oxygen administration gear.

Checklist	**Needs Improvement Date**	**Proficient Date**
Check D.R.A.B.C. Appropriate introduction and attitude by first aider. Ensure correct posture and fresh air. Assess respiratory status: - position adopted; - appearance; - speech (ability and flow); - sounds of breath (wheeziness, cough); - respiratory rate and rhythm; - respiratory effort; - skin colour; - pulse; - conscious state. Assist in giving 4 puffs using casualty's inhaler and spacer. Re-assess at 4 minutes. If no improvement or attack considered moderate or severe: - call ambulance; - administer 6-8 puffs every 5 minutes until ambulance arrives. If symptoms improved and assessed as mild, direct to local doctor. As appropriate: - administer nebulised salbutamol by protocol; - administer oxygen at 15 lpm. Complete OB12 form.		

Neck and Spinal Injuries

PRESCRIBED REFERENCES: St John Ambulance Australia (1998). *Australian First Aid*, reprinted annually, Chapter 8.
St John Ambulance Australia (1994). *Rationale of First Aid.* Supplementary Training Material.

AIM: To enhance the knowledge of and enable the member to revise the recognition and appropriate first aid care for spinal cord and vertebral injuries.

OBJECTIVES: Following prescribed reading and skills maintenance programme training, the member will develop a more detailed understanding of:

8.1 the anatomy and physiology of the spinal cord;
8.2 mechanisms of injuries which are significant in causing spinal cord injuries;
8.3 assessment of a person with a spinal injury;
8.4 the first aid management of neck and spinal injuries.

PRACTICAL SKILL: **8.1** The member will be able to satisfactorily prepare and apply an improvised cervical collar to a casualty.

Introduction

A spinal cord injury is one of the most disabling traumatic conditions affecting individuals. Besides the physical injury, it causes immense psychological damage to the casualty, plus the casualty's family and friends. Adolescents and young adults are the main victims. Their lifestyle predisposes them to the types of situations, occupationally and domestically, that cause spinal cord injuries.

In Australia, approximately 50 per cent of spinal cord injuries result from road traffic accidents. Diving accidents are responsible for a further 10-12 per cent. The remainder occur in the sporting, occupational and domestic environments. Alcohol has been associated with approximately 50 per cent of spinal injuries.

The Vertebral Column

The spine consists of the spinal column (vertebrae), the spinal cord and the supporting ligaments which hold and support the vertebrae in place. Between the vertebrae are discs made of cartilage, which act as shock absorbers and stop the bones from rubbing against each other. These discs deteriorate with age, so that older people are more likely to suffer chronic back pain and are more vulnerable to back injury.

The spinal column consists of 33 vertebrae altogether: 7 cervical (neck, most cannot be felt by the first aider), 12 thoracic (chest), 5 lumbar (lower back), sacrum (5 bones fused together in the pelvic area), and the coccyx (4 bones fused together as the tail bone).

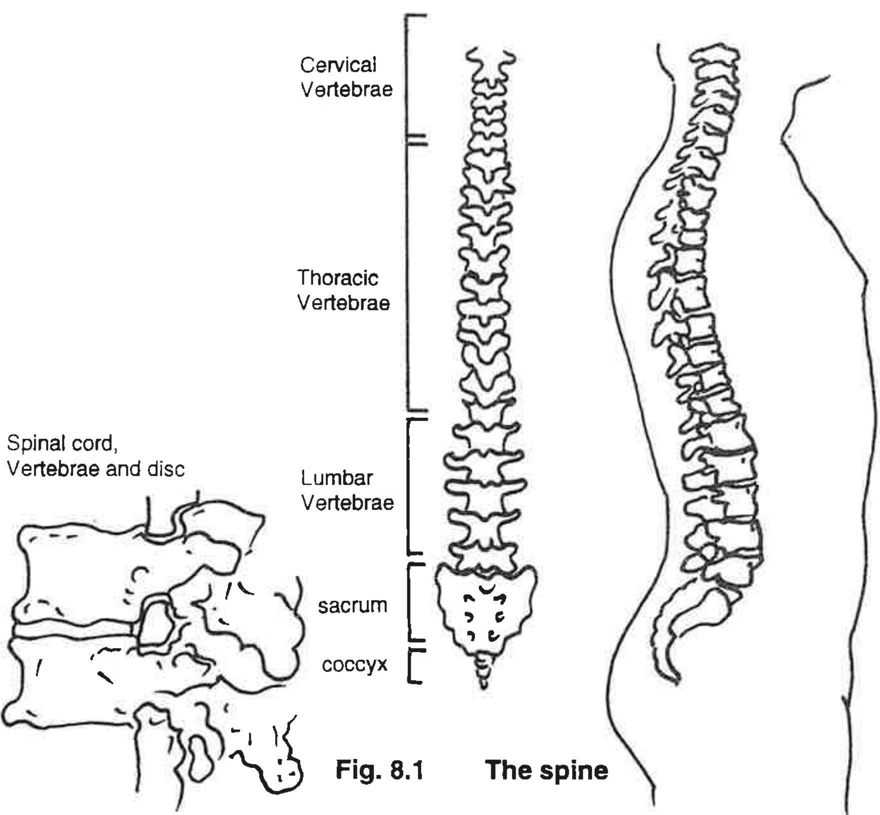

Fig. 8.1 The spine

Most of the vertebrae have a hole through the centre (spinal canal) and this is where the spinal cord passes. The vertebrae afford protection for the spinal cord. On each side of each vertebral arch, just behind each vertebral body, the nerves to the body emerge.

The Spinal Cord

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

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

Simply, impulses from the brain transmit commands to muscles and organs. Sensory impulses from the periphery take information to the brain on touch, temperature, pain and position of limbs. Therefore, any temporary or permanent loss of a bodily function may be due to damage of the spinal cord.

Vertebral (bony) Injury

The types of injury that result in spinal damage are:
- fractures;
- dislocations;
- subluxations (partial dislocations);

or any combination of the above.

These injuries can be classified as stable or unstable. However, proper x-ray evaluation is required for their classification and is beyond the capability of a first aider at the scene of an incident. All suspected injuries to the spine must be considered to be unstable, likely to slip and cause further damage.

Spinal Cord Injury

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

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

- total or partial muscular weakness or paralysis;
- nil, decreased or altered sensation;
- altered autonomic control.

Quadriplegia

Quadriplegia is produced by a neck injury involving damage to the spinal cord. It involves paralysis of the upper limbs, lower limbs and trunk muscles. Some muscles of respiration may be affected to varying degrees.

Paraplegia

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

Causes of Spinal Cord Injury

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

- casualties falling from a height > 5-6 metres;
- a direct blow to the spine including penetrating injury such as gun shot or knife-like wounds;
- jackknifing;
- diving or surfing accidents;
- vehicular accidents where overall impact speed is > 60 k.p.h. with or without major vehicular damage;
- sudden acceleration or deceleration, e.g. a sudden blow to the head of an athlete whilst running;
- where a person becomes a projectile, e.g. bumped off bicycle, ejected from a car, or comes off a moving motorcycle;
- pedestrian hit by a moving vehicle travelling >30 k.p.h.;
- casualties from any vehicle that has had a roll-over;
- casualties from any vehicle that has had an accident where a death has occurred;
- casualties hit by a falling object from a height > than 5-6 metres (object dependent);
- any injured casualty that has been trapped for >30 minutes.

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

Assessment of the Injured Person

History

The casualty and any observers must be questioned as to what happened. Ask about the mechanism and consider the magnitude of the forces involved. The first aider must appreciate and recognise the various types of situations that potentially cause spinal cord injury.

Presenting Features

1. The Conscious Casualty

Symptoms:

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

Signs of bony injury:

- Tenderness/pain over the injured area of the spinal column;
- Deformity of the spine is relatively uncommon and should not be looked for if it cannot easily be felt when assessing the tender area;
- External swelling is usually minimal or absent at the time of the injury. Its absence does not exclude significant bony injury.

Signs of spinal cord injury

MOTOR:

- Reduced or absent muscle power, on asking the casualty to move upper and/or lower limbs.

- A poor cough may indicate weak chest and abdominal wall muscles. In neck and upper thoracic spine injuries, paradoxical movement of the chest wall will be present. Paradoxical breathing occurs when, instead of the chest expanding on inspiration, it moves inward and the reverse occurs as the casualty breathes out.

SENSORY:

- Altered or absent sensation below the injury. Remember that a neck injury affects the upper limbs.

- Compare limbs and trunk sensation with that of the face. Sensation on the face will not be affected by spinal cord injuries and remains normal.

AUTONOMIC

- The usual signs of shock (as haemorrhage) may be absent as the nervous impulses that would produce these signs are interrupted. In neck and upper thoracic spine injuries, the exact opposite happens:
  - The pulse rate may be slow.
  - The pulse strength is either weak or normal.
  - The skin remains dry but warmth and colour are variable. This is because blood vessels lose their ability to constrict as their nerve supply is not functioning.
  - A male casualty may have an erection as the penile blood vessels become engorged with blood due to the dilation of these blood vessels.
  - Breathing may increase in rate but its depth is commonly reduced owing to muscular weakness of the abdominal and chest wall muscles. Paradoxical breathing will be present. Cough will be poor.
  - Following injury, the stomach and intestine will stop absorbing its content. Thus there is potential hazard of the casualty quietly regurgitating whilst lying flat on the back and obstructing the airway with or inhaling vomitus.
  - The casualty will be unable to evacuate or empty the bladder and bowel owing to paralysis of those associated muscles. This leads to retention of urine and the bladder may be palpable like a tennis ball in the middle of the lower abdomen.

2. The Unconscious Casualty

Spinal cord injury needs to be suspected in all persons unconscious as a result of an injury. It is unlikely that a first aider, who is not skilled in assessing spinal cord injuries, will be able to confidently diagnose such an injury in an unconscious casualty. However, management does not alter. The approach is the same as for the conscious casualty. It does not matter whether the casualty has a spinal cord injury or not until the dangers and life threatening problems have been assessed and managed. Thus the unconscious and spontaneously breathing casualty will be on the side at the time of examination for other injuries, with control of the head and neck to ensure stability in a neutral alignment position when the casualty is turned.

Signs

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

- a paraplegic will have loss of muscular tone in the lower limbs yet there is muscle tone present in the upper limbs;
- a quadriplegic may have no response to painful stimuli in the upper limbs, lower limbs or trunk when a grimace is noted on testing for painful stimuli to the facial region;
- dry skin in the presence of a slow, either weak or normal pulse strength;
- paradoxical breathing;
- the presence of an erection in a male casualty.

Internal haemorrhage

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

Management of Spinal Cord Injury

1. The unconscious casualty:

- D.R.A.B.C.

- Place in recovery position, supporting head and neck at all times.

- Maintain a clear and open airway.

- Apply a rigid cervical collar if available and you are trained in its correct application; otherwise use a folded towel, newspaper or a bulky dressing around the neck.

- Continue the examination of the casualty whilst on the side.

2. The conscious casualty:

- Reassure and calm the casualty.

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

- Assessment should be brief and simple:
    - Can the casualty feel one or more of the limbs? Sensory loss may be incomplete or involve only one side of the body.
    - Does the casualty have sensation in some, or all, of the trunk?
    - If not, where does the alteration in sensation occur?
    - Ask the casualty to shrug the shoulders, flex the elbow, move the fingers and make a fist.
    - Ask the casualty to flex the hip, bend and straighten the knee, and bend the foot up and push it down again at the ankle.

- Do not move the casualty unless this is essential due to danger(s). If essential, where an appropriate lifting device is available and you are trained in its use, it should be used. Avoid bending (flexing) the spine. If lifting equipment is not available, drag the casualty by feet (preferred) or by under the armpits.

- Unless circumstances make it necessary, leave lifting, loading and transportation to a qualified person, such as an ambulance officer. It is preferable that the casualty be transferred onto a stretcher using a suitable lifting device.

- Stabilise and support the head and neck by hands until other support can be arranged; this is especially important if the casualty is found in a sitting position when trapped in a vehicle.

- Apply a rigid cervical collar if available and you are trained in its correct application; otherwise use a folded towel, newspaper or a bulky dressing around the neck, or place sandbags either side of the head.

- Seek medical aid urgently.

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

Prompt immobilisation is a high priority for all spinal injuries.

Diving Accidents

When a diving accident has occurred:
- Support the head and neck.
- Use a flotation device or surf board if handy to support the casualty prior to removing from the water.
- Leave the casualty on the board until a doctor or other qualified person has examined the casualty and decided the further management.

A damaged spinal cord may sustain further injury through improper handling. A partially severed spinal cord may become completely cut. An undamaged spinal cord may become injured. Consider every head injury as having an associated neck and spinal cord damage until proven otherwise.

Life threatening injuries always take precedence over possible spinal injuries.

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

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

Lifting Devices

Jordon or Donway Lifting Frames

These type of metal frames are rigid and use plastic gliders to slide under the casualty and then they clip on to each side of the frame. This type of frame, in application and lifting, permits little to no disturbance to injuries that are already present. Although a casualty can be easily lifted utilising the lifting frame, it should only be used for short lifts to an awaiting prepared stretcher. Extreme care should be taken in using this type of lifting frame to avoid the plastic gliders dislodging themselves accidentally from the locating pins down the sides of the frame work.

Scoop Type Stretchers

Scoop type stretchers enable a casualty to be gently scooped onto this type of stretcher by a scissoring/levering action. There is minimal movement of the casualty, thereby minimising any possibility of complicating injuries further. This type of stretcher can have casualties firmly strapped onto it and permit movement through narrow passage ways, down staircases and out of many narrow openings. This cannot be done with many other types of stretchers. Head and neck immobilisation apparatus should be used when a head, neck or spinal injury is suspected. Again scoop type stretchers are recommended only to be used to transport casualties over a very short distance.

Care should be used with this type of stretcher as pressure areas may occur quickly from objects in the casualty's pocket or even debris scooped up when putting the stretcher together under the casualty.

Cervical Collars

Introduction

Since the introduction of the cervical collar in the 1960s, there have been many misconceptions about its role and function. X-ray studies have shown the limitations of the cervical collar as a splinting device and considerable difference in efficacy between devices. Many pre-hospital care providers assume that the application of a cervical collar ensures that no further injury can occur to the casualty's spinal cord. **This is a fallacy and the misconception has led to improper handling of casualties.**

The cervical collar has an important role in the pre-hospital setting. Its main purposes are:

- temporary support of the head of a sitting or standing casualty until placed flat;
- minimising movement of the spine during transport;
- prevention of turning (rotation) and bending of the neck to the side (lateral flexion);
- to highlight to all carers that the casualty has a potential spinal cord injury.

A cervical collar should always be used when there is a possibility of an injury to the cervical spine. Even when applied, the head and neck must still be protected from movement.

For all types of collars, it is intended that a neutral position will be achieved and maintained. A neutral position (alignment) is considered to be present when the casualty is looking straight ahead, i.e. the eyes should be in a gazing-forward position in a line at right angles to the line of the spine.

The cervical collar is **NOT** designed to:

1. totally immobilise the cervical spine; head and neck movement is restricted to about fifty per cent by a semi-rigid or rigid collar;
2. provide traction to the head.

Types of cervical collars

Cervical collars may be described as improvised, semi-rigid or rigid. There is confusion about the category into which some collars should be placed.

An 'improvised collar' will be used when a purpose-made collar is not available and will be devised by a first aider from material immediately available. Its efficacy will depend on the ingenuity of the first aider and the skill with which it is applied. The principles of 'doing no harm' and 'effective immobilisation' are paramount.

A 'soft collar' is usually made of foam rubber or equivalent. St John National Supplies presently stocks such a collar (BarMed, small, medium, large) and provides a medium size for Divisional First Aid kits. The collar is comfortable, if applied to an average adult and provides a degree of support. It must not be regarded as being very effective in suspected spinal injuries and must be supplemented with continuing concern about the protection of the casualty's spine. It is generally better than no collar or an improvised collar. This type of collar has not been associated with the pressure sores that have been reported with the more rigid styles and is often used for situations when the neck needs support and significant injury has been excluded.

The CIG 'Medishield' and the like are forms of collars providing more support, with one model capable of being modified to suit different casualties. These collars have been used in some districts. They have variably been classed as either 'soft' or 'semi-rigid'.

Collars of the Laerdal 'Stifneck' type (e.g. 'Vertebrace') have been classed as either 'semi-rigid' or 'rigid'. The 'Stifneck' collar is approved for use as part of a specific training programme conducted by the S.A. District. This type of collar is frequently preferred by ambulance services. The need to carry a set of collars has been a drawback but recently a style with one model being capable of modification to fit a wide range of casualties has been developed. Its role is still being considered. Close liaison with the ambulance service in a district will ensure the best care for casualties with suspected spinal injury.

The use of **any** cervical collar requires that the member has participated in the relevant training programme **approved by the Director of Training**. Utilisation of the same type of collar by Operations Branch and the local Ambulance Service is ideal. This requires organisation, close cooperation and specific training at district level.

In the absence of any collar facility at all, head and neck movement may be minimised by placing sand bags or padded objects on each side of the head. The possibility that these may move and allow sudden and unexpected movements must not be overlooked.

Preparation and Application of an Improvised Cervical Collar

1. Preparation of an improvised collar

   - Use a firm object, e.g. folded newspaper or cardboard, as the core of the collar.

   - Wrap an absorbent or soft material, e.g. a towel, around the core item.

   - Ensure that the collar is correctly sized before application. The distance from the sternal notch to jaw should be such that the neck is in a neutral position. The collar should be long enough to circle the neck.

2. **Application of an improvised collar to an adult casualty**
   See Skills Assessment 8.1.

   - Steady head and neck in neutral alignment.

   - Check that the collar is of appropriate size.

   - Pass the collar around back of neck without movement of spine.

   - Secure collar ensuring that any knots are to the front or to the side.

   - Continue with manual in-line stabilisation until full spinal immobilisation is achieved.

Application of a soft cervical collar to an adult casualty
See Skills Assessment 8.2.

- Steady head and neck in neutral alignment.

- Check that the collar is of appropriate size.

- Pass collar around back of neck without movement of spine.

- Ensure Velcro closure is secure.

- Continue with manual in-line stabilisation until full spinal immobilisation is achieved.

Application of semi-rigid/rigid cervical collar
See Skills Assessment 8.3.

This is only accepted as a formal part of an Operations Branch member's training when it is part of an approved training programme. If this is not the case, it is still of significant value to a member to have an awareness of the technique but it is not to be implemented by an untrained member.

The Training Officer can:
- contact the local ambulance service;
- find out the type of cervical collar used;
- arrange a demonstration of the application of the collar.

8.1 *Prepare and apply an improvised cervical collar*

Checklist	Needs Improvement Date	Proficient Date
Check D.R.A.B.C.		
Assess symptoms and signs suggesting spinal injury.		
Apply manual head/neck alignment from behind if possible; use a second person if available.		
Prepare improvised collar. Note: Without a firm core there is added possibility of pressure on the trachea.		
Check size suitability.		
Inform casualty of intended procedure.		
Remove obstructing items (ties, necklaces etc.).		
Pass collar around back of neck, keeping spine still.		
Mould collar to neck.		
Tie collar in place with bandage or suitable item, e.g. tie, pantyhose.		
Ensure that there is no airway interference.		
Ensure that there is support and stability.		
Check on the casualty's impression of collar; to ensure effectiveness and adequate support, some discomfort is inevitable.		
Re-assess signs and symptoms of spinal injury.		
Maintain manual in-line stabilisation until full spinal immobilisation is achieved.		
Re-check D.R.A.B.C.		

8.2 Apply a soft collar

Checklist	Needs Improvement Date	Proficient Date
Check D.R.A.B.C.		
Assess symptoms and signs suggesting spinal injury.		
Apply manual head/neck alignment from behind if possible; use a second person if available.		
Check collar suitability and size.		
Inform casualty of intended procedure.		
Remove obstructing items (ties, necklaces etc.).		
Pass collar around back of neck, keeping spine still.		
Mould collar to neck.		
Secure Velcro fastener.		
Ensure that there is no airway interference.		
Ensure that there is support and stability.		
Check on the casualty's impression of collar; to ensure effectiveness and adequate support, some discomfort is inevitable.		
Re-assess signs and symptoms of spinal injury.		
Maintain manual in-line stabilisation until full spinal immobilisation is achieved.		
Re-check D.R.A.B.C.		

8.3 Apply a semi-rigid/rigid collar

This is only accepted as a formal part of an Operations Branch member's training when it is part of an approved training programme. If this is not the case, it is still of significant value to a member to have an awareness of the technique but it is not to be implemented by an untrained member.

Checklist
Specify type of collar used: Has the member been trained in an approved programme? Yes ❒ No ❒ If 'Yes', has the member demonstrated proficiency in its application? Yes ❒ No ❒
Record status of assessing officer: Medical Officer / Nursing Officer / Ambulance Officer / Approved Training Officer
Record source for assessment criteria: St John approved syllabus / Ambulance Service protocol

Facial Injuries

PRESCRIBED REFERENCES:	St John Ambulance Australia (1998). *Australian First Aid*, reprinted annually, Chapter 8. Supplementary Training Material.
OBJECTIVES:	At the conclusion of this exercise, the member will be able to: **9.1** manage an unconscious casualty with a fractured lower jaw; **9.2** manage a casualty with a nose bleed.

The face is like a mask that sits in front of the skull and the neck (Fig 9.1). It defines what we look like. In addition, it contains the special sense organs such as eyes (sight), nose (smell) and mouth (taste) so that they lie in close proximity to the brain. The ears (sound) lie further back in the base of the skull and injuries to the ear are best dealt with when discussing head injuries.

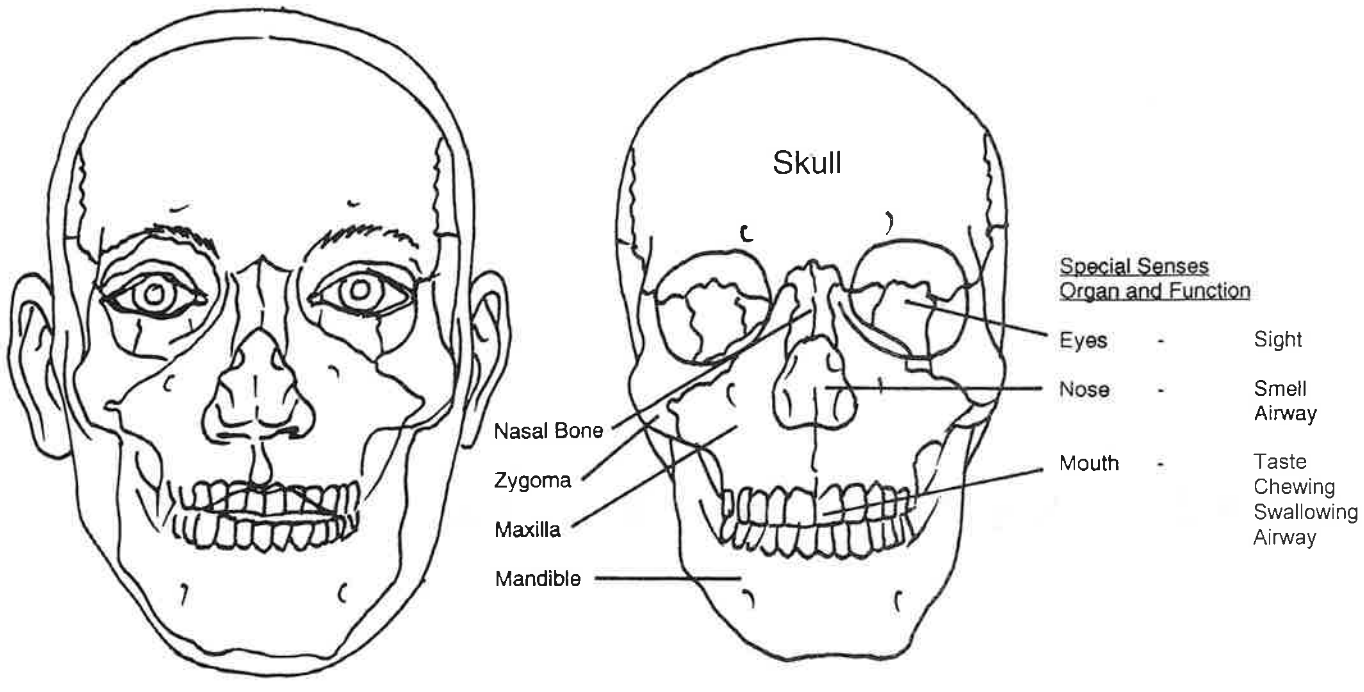

Fig. 9.1 **Fig. 9.2**

The skeleton of the face is made of bones and these protect the special sense organs (Fig. 9.2). The roof of the face is the bones of the base of the skull which partly provide protection to the eyes and nose. Facial injuries may result in these bones breaking. When these bones fracture, it may be in isolation, as with a punch in the nose, or part of other trauma such as head injuries or cervical spine injuries, e.g. in a car accident. The consequences of such injuries can be:

- life threatening from airway blockage;
- disabling from injuries to the special sense organs; and
- disfiguring.

Fractured Nose

Blows to the nose either squash it (head on) or push it to one side (side on) (Fig. 9.3). Swelling and bleeding result. The mouth, if not injured, provides the airway and the management is to control the bleeding and seek medical aid. It often takes a good ten minutes of firm pressure between the fingers to stop the bleeding.

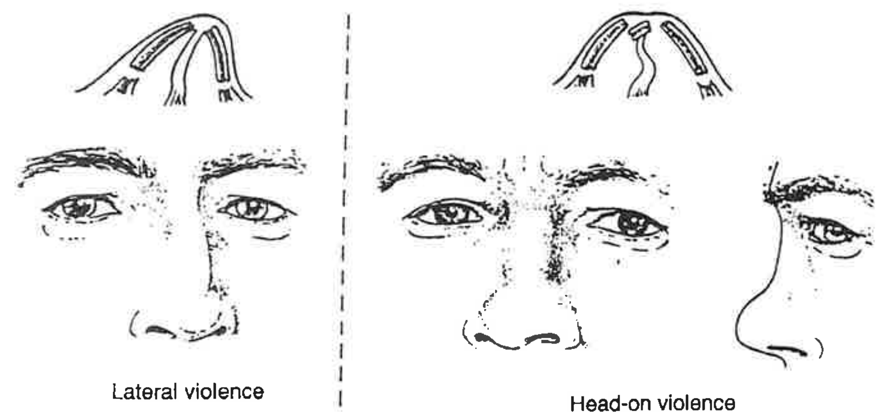

Fig. 9.3

Fractured Jaw (Fig 9.4)

A fractured jaw can result in considerable airway obstruction from swelling and deformity. Bleeding and dislodged teeth can worsen the situation. Pain and an inability to chew are symptoms. Swelling, deformity, malalignment of the teeth and drooling saliva are signs. Airway obstruction is given priority, with the unconscious casualty turned to the side. The conscious casualty usually sits in the most comfortable position and can support his/her jaw. Dislodged teeth should be either returned to the socket and splinted (only if conscious) or preserved in milk or the casualty's saliva. The jaw may occasionally dislocate at its hinge joint (in front of the ear) rather than fracture. This has even been known to happen with yawning! Pain in front of the ear and an inability to close the mouth (from muscle spasm) are features of note.

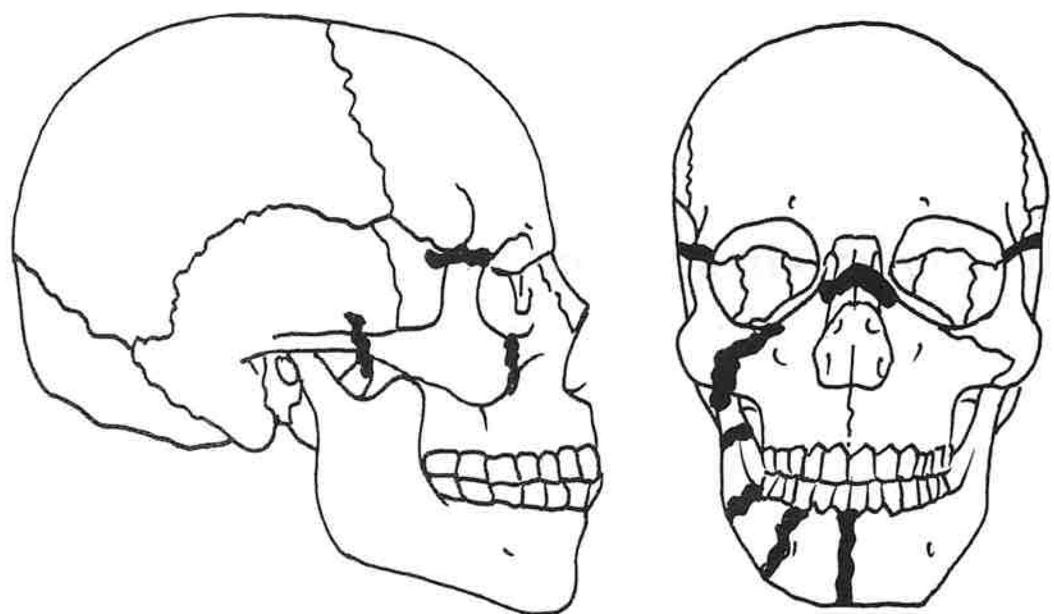

Fig. 9.4 Facial Fractures
Heavy lines indicate common fracture sites

Fractured Zygoma (Fig. 9.4)

The zygoma, also known as malar or cheekbone, can fracture without causing a midface fracture (as described above). This is usually due to a blow to the side of the face. The signs and symptoms are:

- eye symptoms ;
- swelling and bruising of the skin;
- flattening of the cheek;
- numbness to the skin under the eye and the top teeth; and
- an inability to open the mouth from muscle spasm as in dislocated jaws.

9.1 Manage a fractured jaw

A casualty who is unconscious and has a fractured lower jaw is brought into your first aid post. There is no bleeding apparent.

Demonstrate your management of the casualty.

Checklist	Needs Improvement Date	Proficient Date
Dangers		
Response - shake and shout.		
Airway - stable side position; - clear; - open.		
Breathing - check.		
Circulation - check.		
Examination of casualty.		
(On your examination of the casualty, you find the signs of a fractured jaw.)		
Fractured jaw - pull lower jaw forward if necessary to maintain an open airway.		
Seek medical aid.		

Airway management: An Oropharyngeal Airway (if member is qualified to use it) may be used with all deeply unconscious casualties to assist with airway management. (Refer *A F.A.*, 1998, pp. 349-351).

Nose bleed (Also termed as "epistaxis")

9.2 Manage a nose bleed

Checklist	Needs Improvement Date	Proficient Date
Wear gloves.		
Instruct casualty not to blow his/her nose, and to breathe through the mouth.		
Sit the casualty upright with the head slightly forward.		
Instruct the casualty to apply finger and thumb pressure on the soft part of the nostrils for a period of 10 minutes by the clock.		
Take base line (first set of) observations.		
Loosen tight clothing around neck, chest and waist.		
Place cold, wet towels over neck and forehead.		

Checklist	Needs Improvement Date	Proficient Date
If haemorrhage continues after 10 minutes, record vital signs, i.e.: - conscious state; - heart rate; - respiratory rate; - skin, colour temperature and moistness; - and capillary refilling in the nail beds. Assess blood loss if haemorrhage continues after 10 minutes. Arrange transport to medical aid.		

Ear trauma

Ear trauma is given only brief mention because bleeding or discharge from the ear is not from facial bone fracture but base of skull fracture and thus indicative of head injury. The casualty should be placed with the bleeding side down, to allow free drainage, and a sterile pack to absorb the discharge. Prompt medical aid is needed.

Summary

1. Facial injuries can be associated with head injuries and cervical spine injuries as well as isolated injuries.

2. The effect can be:
   - dangerous - from airway obstruction;
   - disabling - from injuries of the special sense organs;
   - disfiguring - from the cosmetic result of such injuries.

3. The first aid management is directed towards securing the airway, minimising blood loss (e.g. from a 'blood nose') and treating other associated injuries (e.g. eye trauma or dislodged teeth) before getting definitive medical care.

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MODULE 10

Extended Casualty Care

REFERENCES:

St John Ambulance Australia (1998). *Australian First Aid.* reprinted annually, Chapter 26.
St John Ambulance Australia (1991). *Survival! Remote Area First Aid.* pp. 23-24.
St John Ambulance Australia (1994). *Occupational First Aid.* Ch. 16.
St John Ambulance Australia (1994). *The Rationale of First Aid.* pp. 124-141.

OBJECTIVES:

10.1 Upon completion of this module, the member will understand the concept of caring for a casualty over an extended period of time.

10.2 The member will correctly carry out the exercises at the end of the module and:
- (a) correctly treat the casualty;
- (b) complete an OB12 correctly;
- (c) determine the type and frequency of observations required for the casualty;
- (d) give the correct advice and refer the casualty on to the most appropriate source.

The role of the Operations Branch is to provide care to people at public duty. In many of these public duty situations, Operations Branch have set up a facility that is designed to deal with all types of casualties. These can range from those with minor injuries or complaints, who require minimal care, through to the very complex casualty who requires extensive care whilst awaiting an ambulance, or who requires care over an extended period of time. In this module, extended casualty care will be covered.

Consider the following case scenario:

> Mr Robinson is a 65 year-old man who has been brought to the first aid room at the city show. He has felt unwell for the last hour and was found by a passer-by sitting on a bench, looking very pale and sweaty.
>
> On arrival he is alert, but very pale and sweaty. He explains that he is an insulin dependent diabetic who took his insulin 45 minutes ago, and hasn't had anything to eat since then. He has slowly begun feeling unwell.
>
> He has a history of high blood pressure and angina. He takes Adalat and Isordil for these problems. He takes protophane insulin twice a day.
>
> His wife is at the Art Show and was due to meet him at midday for some lunch.

The following questions need to be asked:

- What are you going to do for Mr Robinson?
- What observations will he require?
- How long will he have to stay in the first aid room?
- Will he have to go to hospital?

This scenario is not uncommon. Many people present with similar problems at duties we undertake every day. They present unwell, but not so unwell that they require transport to hospital by ambulance. In many cases close observation of their condition and treatments based on our findings mean that they can eventually be discharged, to seek advice from their family doctor as required.

Mr Robinson presented with a mild hypoglycaemic episode. The first aiders on duty rested him, kept him warm, recorded his vital signs, and offered him sweet drinks and something to eat. After 30 minutes they noted his colour had improved, he was alert, had stopped sweating and felt much better. The Registered Nurse on duty checked his blood sugar level (BSL) using a glucometer. His initial reading was 2.4, and thirty minutes later was 7.6.

All this indicates that his condition was improving. With some sound advice such as "Eat after taking your insulin", reassurance and arranging for his wife to be notified, Mr Robinson should be able to be discharged. He should be advised to see his family doctor when convenient or if this problem recurs.

As well as the primary problem, there are also many other problems that need to be cared for such as hygiene, comfort and fluid intake. All these need to be undertaken and documented. The following information is related to caring for a casualty over an extended period of time.

Casualty assessment and management

Follow the principles of casualty assessment and management:

1. **Primary Assessment**

   - **D**anger.
   - **R**esponse.
   - **A**irway.
   - **B**reathing.
   - **C**irculation.
   - **C**ontrol major bleeding.

   MANAGE TIME CRITICAL PROBLEMS FIRST

2. **Secondary Assessment**

   - Vital Signs.
   - AMPLE History:
     - Allergies;
     - Medication;
     - Past medical history;
     - Last meal;
     - Events leading up to illness or injury.
   - Head to toe examination.

3. **Management**

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

REMEMBER THE RULE
ASSESS * MANAGE * REASSESS * APPROPRIATE DISPOSAL

Whilst the treatment of the casualty's condition will not change regardless of the time the person is in the care of the Operations Branch, there are five basic principles that must be adhered to, in managing a casualty's condition over an extended period of time.

1. **Keep the casualty calm and reassured**

Many people are unfamiliar with illness and injury and subsequently fear and anxiety can be a major concern. Anxiety and fear can cause the casualty to become distressed, overbreathe and compound existing injuries. Reassure the casualty constantly.

If available and appropriate, allow a familiar person to sit with the casualty whilst being managed. This is particularly important with children as they have a completely different perception of the world.

Establish a level of trust and rapport with the casualty:

- Always refer to the casualty by name rather than complaint (i.e., "Mr Jones in Bed 2" not 'asthmatic in Bed 2')
- Don't talk over the casualty. Talk to him/her directly.
- Don't talk about the casualty as a third person. If you need to discuss his/her condition or case, involve the casualty in the discussion or go to another room.
- Be honest.
- Keep the casualty informed.

2. **Comfort and Hygiene**

(a) Comfort

Generally speaking, casualty comfort will depend on the type and severity of illness or injury. Most casualties will find the position that is most comfortable for them. Where there are injuries that dictate the position required, ensure the casualty's skin is well protected, i.e. pad any bony prominence to prevent pressure areas from developing. A glove filled with air provides an excellent cushion for the heel.

Pressure Areas

A pressure area is an area of reddened tissue, which may or may not be painful, that occurs when tissue is compressed. This can occur when the casualty is resting on an area or when an item (e.g., sheet, splint) is pressing against the casualty. If pressure areas are detected and managed, it will prevent a pressure sore developing.

Pressure Sores

A pressure sore develops when an area of tissue is compressed and deprived of oxygen and nutrients.

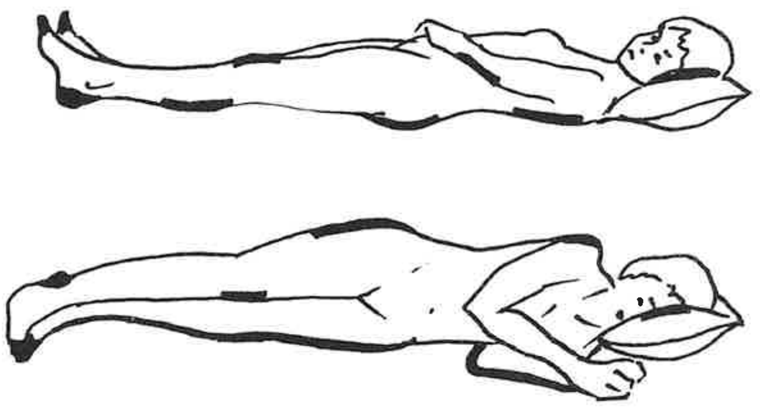

Fig. 10.1 **Sites where pressure sores may occur**

Causes of pressure sores are:

- pressure on a particular area causing an impairment of the network of small blood vessels. Pressure can occur from lying in one position for too long, especially over a bony prominence. Pressure can also occur with ill fitting splints and plasters.

- repeated friction from loose sheets and bandages and from sitting in one position for extended periods of time (shearing of tissue as opposed to pressure).

- exposure to wet areas for an extended period of time which can make the skin soggy. Urine is particularly irritating to skin.

Those casualties at risk of developing pressure sores:

- are very thin;
- are obese;
- are incontinent;
- have spinal cord injury (old and new);
- have poor circulation;
- are unconscious;
- have poor nutrition.

Sites that are at risk for pressure sore development are the:

- sacral region;
- buttocks;
- hips;
- calves;
- skin over the shoulder blades;
- shoulders;
- knees;
- heels;
- toes;
- ankles;
- elbows;
- occiput (back of head).

Strategies to prevent pressure sores include:

- check pockets for hard objects;
- re-position casualty regularly;
- check splints and bandages frequently for signs of increased pressure;
- change soiled linen as soon as possible;
- keep skin dry;
- keep linen as crease-free as possible;
- avoid any injury to the skin.

Another important aspect of casualty comfort is keeping the casualty warm. Lowering of the body temperature is a major cause of complications in an ill or injured casualty. When casualties become cold, they begin to use extra energy to try and maintain internal body warmth. This extra energy production burns up more oxygen and subsequently can deplete the tissues of the required oxygen.

In situations where the casualty is in a warm environment, be aware of signs of overheating and subsequent dehydration. If the casualty is able to drink and this is permissible, maintain fluid intake. Keep the casualty cool if heat illness is suspected.

(b) Hygiene

Casualties should not be deprived of hygiene needs. The use of toilet should be offered regularly, especially if they require assistance.

Where the skin is soiled with body fluids, it should be washed with a mild soap and warm water, as soon as possible. This will promote comfort and prevent skin irritation.

The first aider should maintain a clean environment. Good infection control practices are essential to avoid transmission of infection.

3. Accurately observe and record the casualty's condition

Regular observation of vital signs is important. These observations will alert us to changes in the casualty's condition.

The frequency and type of the observation is dependent on the casualty's condition. In an unconscious casualty, observations need to be made on a two-minutely basis (so that any life threatening changes can be detected early). For a casualty with a limb fracture, a set of vital signs is taken on arrival, with frequent checks then made of the circulation, sensation and movement of the injured limb.

The types of observations that may need to be made are:

- conscious state;
- pupils;
- temperature;
- pulse rate;
- breathing type and rate;
- blood pressure (if qualified);
- skin colour and condition;
- observations of injured limbs for colour, temperature, sensation, movement and pulse.

Conscious State

Determining the casualty's level of consciousness is an important tool. By utilising a standard measure such as the Glasgow Coma Scale, plotting any changes in the casualty's conscious state can be kept to a standard (refer to Table 10.1)

GLASGOW COMA SCALE
Score the best response in each of the categories

Response	Score
EYE OPENING	
Spontaneous	4
To speech	3
To pain	2
Nil	1
BEST VERBAL RESPONSE	
Orientated and converses	5
Disorientated and converses	4
Inappropriate words	3
Incomprehensible sounds	2
No response	1
BEST MOTOR RESPONSE	
Obeys commands	6
Localises to pain	5
Withdraws from pain	4
Abnormal flexion (draws arms towards body)	3
Extension (arms extend away from body)	2
No response	1

Table 10.1

Pupils

Assessment of pupil function should occur, especially in casualties who have sustained a head injury or are suffering from a condition affecting the nervous system. Observation of pupil size (in millimetres), shape, and reaction to light should be recorded.

Various types of medication and other factors may affect the size, shape and reaction of the pupils.

- Trauma to the eye may alter pupil size and shape.
- Disease such as cataracts may make observation of the pupil difficult.
- Medication used for various eye conditions may alter the size and reaction of the pupils.
- Certain drugs such as narcotics may cause abnormal pupil findings.
- The casualty may have a pre-existing pupil abnormality or an artificial eye.

Temperature

Where fever is present or in situations where the casualty is suffering from extremes in temperature, taking of the temperature is an important observation. Monitoring body temperature allows response to treatments such as cooling and rewarming to be evaluated.

Pulse

Observation of the pulse rate, rhythm and strength should be made at regular intervals. A change in pulse rate may indicate favourable responses to treatment or alert the observer to deterioration.

Respirations

Assessment of respiratory rate, rhythm, depth and the character of respirations should be made. In cases where the casualty has a primary respiratory problem such as asthma, observation of signs such as wheeze, degree of difficulty in speaking and use of accessory muscles should be recorded. If authorised, assessment of the Peak Expiratory Flow Rate may also be recorded as part of the respiratory assessment.

Blood Pressure

In some States, after special training, members are able to monitor the blood pressure by means of palpation. In this technique, only the systolic blood pressure is measured. Measurement of blood pressure can be utilised in any casualty but is particularly useful in cases where bleeding or fluid loss has occurred or may be suspected.

A slowly falling blood pressure may indicate continued hidden bleeding, e.g. into a body cavity. Close monitoring of blood pressure, pulse and conscious state along with other signs and symptoms such as dizziness on sitting or standing will indicate that bleeding is continuing.

Skin colour and condition

Observation of skin colour and condition can provide a wealth of information. Increasing pallor may indicate continued concealed bleeding. Increasing cyanosis may indicate breathing problems.

Observation of skin condition is vital, especially where there has been disruption to the integrity of the skin or where there is potential that limb circulation may be impaired. Regular checking of skin colour and temperature along with movement and sensation in limbs is vital when dealing with an injury to the extremity.

Regular checking of pressure areas is vital to help prevent pressure sores from developing.

Neurovascular observation

Any casualty who sustains an injury to a limb should have regular observations of the circulation, sensation and movement of the affected limb. This is particularly important when a treatment such as a pressure bandage or splint has been applied. Splints and bandages need to be firmly applied, but not so tight as to impair circulation.

Observe for the following:

- Colour	Pallor may indicate decreased circulation.
- Temperature	A cool limb can also indicate decreased circulation.
- Capillary return	Gentle pressure on a nail bed or skin surface should elicit a return from white to pink in less than two seconds. This indicates good circulation to the limb.
- Movement	The injured limb or part of the limb should be able to moved passively. The limb should never be moved actively as this can cause more pain and possibly aggravate the injury.
- Sensation	Areas of sensory loss should be recorded. Changes in sensation such as numbness or 'pins and needles' should be recorded. This can indicate an increased swelling, causing pressure on the nerve supply.
- Swelling	Increase in swelling and bruising should be noted.
- Pulses	Observation of the pulses below the site of the injury on the affected limb should be performed to assess circulation.

4. **Fluid Intake and Output**

Date/Time	Oral Intake FLUIDS	Oral Intake FOOD	Output URINE	Output VOMITUS	Output OTHER
TOTAL					

Table 10.2 - Sample Fluid Balance Chart

Any casualty who sustains an injury likely to require surgery should not be given anything to eat or drink until assessed by a doctor.

Recording fluid intake may be necessary especially when dealing with a casualty who is dehydrated or is likely to stay for an extended period of time. All intake and output should be recorded on the casualty report form or a fluid balance chart (see Table 10.2).

For casualties who are unable to eat or drink, the following may be undertaken to maintain their comfort:
- moisten their lips with water;
- give small amounts of ice to suck;
- regular mouth washes.

Casualties who are drowsy or unconscious should never be given anything by mouth.

5. **Regularly check the adequacy of all treatments applied and the casualty's response to such treatments**

When managing any casualty for any period of time, constant reassessment of all treatments should take place. Changes should be noted on the casualty report form (OB12). Medical aid should be sought when appropriate and the correct advice should be given to casualties being discharged from your care.

Any medications that are given should be documented. Response to medication should also be documented. This is important if it has been used to relieve pain or control any other symptoms.

Maintenance of a good casualty record will enable accurate handover to medical aid when it arrives.

Exercises

1. You are on duty at a local rock festival. The first aid room is quiet. A casualty presents a history of fainting in the crowd. She is sweaty and feels nauseated on her arrival.
   - What observations are you going to make?
   - How frequently would you perform them?
   - What would be the most appropriate transfer for this casualty?

2. An eighty-year-old man presents with a history of chest pain after walking up some stairs at the local concert hall. He describes the pain as similar to his normal angina. He has taken his anti-angina tablet, which is starting to work.
   - What observations are you going to make?
   - How frequently would you perform them?
   - What would be the most appropriate transfer for this casualty?

Stage these two scenarios, ensuring that all the questions asked above are undertaken. Complete an OB12 for each scenario.

Concept of Psychological First Aid

Introduction

For an individual, health is not only determined by the absence of disease, injury or infirmity, but also by a complete feeling of social and mental well being.

Therefore, when one is approaching injured or sick people, not only does their physical state need to be considered, but their mental well being is also of paramount importance. How you treat people is of considerable importance in maintaining their mental well being. A caring, kind and considerate manner is an essential element of the first aid you provide to an individual. Thereby you ensure that that person's experience of your first aid service remains a positive one, not only from the physical but also the mental perspective.

Being subject to events that can cause mental trauma is part of the spectrum of normal life experiences. How an individual copes with the mental processing of such events can determine the associated mental health outcome. The traumatic events most often causing psychological stress include:

- sudden injury or serious accident;
- assault;
- news of sudden death or significant injury of a close relative or friend;
- rape;
- threat against one's life;
- being part of a natural disaster (e.g. bush fire) or a mass casualty situation; or
- seeing somebody killed or seriously injured.

If an individual involved in such an event does not cope with the mental processing required, then it is highly likely that Post Traumatic Stress Disorder (PTSD) will result. The lifetime prevalence of PTSD within society is approximately one per cent. In general, the more severe the traumatic event experienced, the greater the risk and likelihood of PTSD becoming chronic.

The first aider can reduce the impact that traumatic events have upon individuals by not compounding or adding to the trauma suffered by those individuals and through ensuring a competent, caring, considerate and compassionate attitude is maintained during the provision of first aid services at all times.

Emotional Response to Disaster/Major Trauma

Significant events affect all those involved, whether directly or as bystanders. It is important to know about the possible human reactions to such situations and how to look after yourself as well as how to help others. The following information on reactions is designed to help you to deal with them more effectively, and assist in preventing them being made worse through misunderstanding.

What to expect

A disaster or major traumatic event is usually unexpected and involves a threat to life and or welfare. Under such circumstances it is normal to have an intense reaction, even if the person is only indirectly involved. Children and teenagers may be more affected. Some typical reactions are listed below:

(a) Disbelief: numbness, feels unreal or like a dream, can't take it in, hard to comprehend.

(b) Body reactions: tension, trembling, nausea, weakness, tension, loss of appetite, sweating, tiredness.

(c) Thoughts: confusion, can't concentrate, hard to think clearly, cannot remember simple things, can't stop thinking about what happened, remember other things that have happened before, difficulty in planning.

(d) Images: flashbacks, keep imagining what happened, details stuck in memory and won't go away, think it is happening again, mistake familiar things for aspects of the event.

(e) Emotions: fear, horror, sadness, irritability, anger, looking for someone to blame, apathy, can't get motivated, loss of energy, helplessness, no longer feel safe anywhere, rapid changes of emotion from one extreme to another.

(f) Behaviour: highly aroused, can't settle down, disturbed sleep, dreams and nightmares about the incident or other bad dreams, a desire to drink alcohol, smoke or eat more.

(g) Attitudes: bitterness, pessimism, feel somehow to blame, guilt at surviving or not being there, feel a failure, should have done something, why did it happen, what does life mean now.

(h) Social: want to avoid people or don't want to be alone, irritable and intolerant, feel no one understands, can't let go of those who were involved, can't stop talking about it or can't bear to talk about it.

These are normal, common reactions that occur with people as a result of any kind of significant event or disaster, to a greater or less extent, and are a person's attempt to adjust to what has happened. It is unusual for people not to have some of these reactions at some time after the event.

Guidelines for First Aiders

Disaster or significant trauma involves massive emotion and unexpected experiences which will be very stressful to an individual. People directly involved (including casualties) and bystanders are most likely to be affected. Reactions can be intense and take time to resolve. Immediate assistance reduces such problems and hence assists in the prevention or reduction of PTSD. People can be helped to look after themselves.

Traumatic stress

Trauma overloads the mind and emotions and may cause immediate or delayed reactions. It destroys normal expectations and confidence in predictability and personal safety. It may cause confusion, disorientation and lack of ability to visualise the impact of the event, as people do not know what to do with themselves in such unusual situations. They may be reluctant to leave the scene, feel locked into it or attached to the people involved. It is important not to tell them what to do, without first trying to understand what they need.

Problems are aggravated by people not knowing what is happening to them, whether their reactions are normal or abnormal. Some people feel foolish and ashamed of themselves. Give clear, compassionate and caring simple guidance as soon as possible. Restoring confidence allows people to begin their own personal recovery processes.

The role of the first aider

First aiders can help by showing compassion, caring, listening, supporting, giving information and helping with practical needs. People need information about their reactions and to understand what is happening to them, plus simple advice about how to help themselves through it.

(a) Look to see what people want and need. They may not be able to express it.

(b) Help them feel in control of themselves by letting them make simple decisions about their own welfare.

(c) If they are distressed, provide comfort, compassion and companionship. Do not reassure or talk them out of their feelings.

(d) Confirm that they have good reason to be upset. It is normal, but it will pass.

(e) Help them recover their composure in their own way and their own time. Sometimes it is best to sit quietly with them until their emotion subsides.

(f) Listen respectfully to everything they say. Indicate it is important and you wish to understand them.

(g) If they are dazed or confused, gently give advice about what to do to look after themselves and where to go next. Ask them to tell you what they need. Concentrate on simple needs first, e.g. drink, warmth, family members' whereabouts.

(h) Help people to find their companions and encourage them to stay together. Encourage them to support each other.

(i) Advise them to take time to settle down before they leave, and not to rush away until they are ready.

(j) Remember what you say; your attitude and care will have a significant impact on how they feel and ultimately their experiences associated with the event.

Guidelines for good listening:

- Look directly at the person speaking to you.
- Avoid interrupting.
- Ask questions occasionally to make sure you understand what is meant.
- Do not judge. Let them speak freely and complete what they want to say.
- Don't tell people what they should think or feel.
- Make sure you know why a question is being asked before answering it.

General advice

The following general advice will assist in minimising the impact of traumatic stress:

(a) Individuals must recognise that they have had a distressing experience and will react to it. Do not try to talk them out of it or imply it is a weakness.

(b) Advise them to seek other understanding people for support.

(c) Advise them to talk and think about what happened; blocking it out may make it worse. It is healthy to be upset but unhealthy to suppress it.

(d) Advise them to be careful on their way home. Concentration may be impaired; therefore, accidents are more likely.

e) Advise them to take time out to recover over the next few days and watch for their reactions so that they know how to look after themselves.

(f) Advise that it may take time to calm down afterwards and to do things to help themselves relax and unwind. For example, mild physical exercise and maintaining a well balanced diet, while not seeking pharmacological crutches, such as alcohol and tobacco, are most appropriate.

(g) Advise that if they are 'numb' and 'switched off' to try to involve themselves in some of their simple routines of life, to get going again.

(h) Advise them that if they are worried or not getting better, they should seek advice and help to prevent problems developing. Help can be obtained from their medical practitioner, community health centre, clergy or appropriately qualified mental health counsellor.

Unhelpful ways of relating to affected people

The following are likely to make things worse for people exposed to traumatic stress:

- ordering them around or telling them to do things without explaining why;
- telling them not to worry, that it could have been worse, others are worse off, or they are lucky it wasn't worse;
- talking down to them;
- not listening to them;
- reassuring them that everything is all right, when it is not;
- taking their anger or other emotions personally;
- separating them from those they are with, especially their loved ones;
- getting sentimental or excited with them;
- not giving them privacy or independence when they need it;
- not treating them with due respect, compassion and a caring attitude.

References:

Pearn, J.H. et al (1996). *The Science of First Aid*, 1st Edition, St John Ambulance Australia.
Gordon, R. and Wraith, R. *Medical Displan*, Mental Health Coordinators, Department of Human Services Victoria.

Ethics for First Aiders

Introduction

Ethics are central to the oath, often taken by medical graduates, which was originally devised in the fourth century B.C in Greece by Hippocrates of Cos. It is as appropriate, and just as relevant, for first aiders as it is for doctors. A modified version prepared by Professor Pearn states:

> *My practice - in all the manifestations of the Art and Science of Healing and Health - I shall adopt for the benefit of those in my care according to my ability and my judgement, and not for their hurt or for any wrong. I shall endeavour to preserve life at all times. I will not embark on those procedures for which I am untrained and I shall give place to such as are therein skilled in specialist crafts. Into whatsoever place I go as a healing helper, I will enter to help the injured and the sick and will abstain from all intentional wrong-doing and from harm. Whatsoever things I see or hear concerning the life of those in my care, and in my attendance upon the injured and sick - I will keep silent thereon, counting such things to be as sacred secrets. From such precepts cometh that reputation for all that is ethical and best in the great tradition of the Healing Art.*

The principles of Hippocrates have never been more applicable to the practice of first aid than they are today.

Ethics is defined as a system of moral principles by which human actions may be judged as good or bad. Ethics guides the rules of conduct of all proud professions of which first aid is one of the oldest. Ethical first aiders are concerned, like the Good Samaritan, with managing in the best way possible the injuries of the casualty. Like Hippocrates, they value the casualty's dignity and privacy and, with limited exceptions, preserve the confidentiality of clinical information about the injured and the sick.

Principles of Medical Ethics

Today, four basic principles guide medical decisions about what is ethical behaviour:

- Beneficence: everything which is done is for the benefit of a casualty.
- Non-maleficence: do no harm.
- Autonomy: even though sick or injured, rational casualties should still participate in any decision which affects them.
- Justice: equality and non-discrimination.

St John Principles

In the Regulations of the Priory in Australia, the second object and purpose of the Order is:

> *The encouragement and promotion of all work of humanity and charity for the relief of persons in sickness, distress, suffering or danger, without distinction of race, class or creed and the extension of the second great principle of the Order embodied in the Motto 'Pro Utilitate Hominum'.*

Members of Operations Branch have as a major objective the undertaking on a voluntary basis, either as individuals or as organised groups, first aid and allied activities within the community when and as required (revised General Regulation 1.2). Also "it is the duty of members of Operations Branch to render first aid, when necessary, irrespective of time or place and whether in uniform or not" (revised General Regulation 8.1). Other ethical responsibilities arise from the Christian traditions of the Order and embody such themes as charity, volunteer outreach and selfless service. Still other ethical responsibilities arise from secular expectations in society such as the policy on sexual harassment. Others, such as the duty of care, are derived from legal concepts.

Training

Operations Branch members have the responsibility to maintain their competence through regular re-training and re-certification. This enables them to administer first aid to the best of their abilities. Equally they need to act within the boundaries of their training. Because of the great variety of circumstances, many unforeseen within which first aid may need to be given, its teaching cannot cover every eventuality. Training, therefore, must concentrate on core techniques. First aiders need to concentrate on these core skills. It is not the business of first aiders to play at being doctors by adding modifications to standard first aid procedures.

Intervention

While the giving of first aid is fundamental to membership of Operations Branch, the decision of each individual to give or withhold first aid is ultimately a moral or ethical decision. It is totally personal. It is not always an easy decision. First aiders are sometimes confronted with a situation in which they have to weigh the good of the casualty against their own good. They may be putting themselves at risk by entering or remaining in a scene where there is danger, say from fire or electricity, in order to help the casualty. Danger to the first aider and to bystanders is the first step in the D.R.A.B.C. protocol which is considered in every contact with a casualty. There may also be the risk of infection from the casualty. The parable of the Good Samaritan says it all. Ultimately, it is the individual first aider who must decide whether to offer help or pass by on the other side.

The Duty of Care

Legally, the standard of care that the first aider delivers must be reasonable. If litigation for negligence were to occur, the courts would ask what a reasonable person with the training and experience of the defendant would do in the circumstances. At this stage, the standard of care owed by a St John first aider has been tested in only one legal judgement, in a case in England in 1988.[1] The judge concluded that " if in any situation the first-aider acts in accordance with the First Aid Manual and does so with ordinary skill, then he has met the test and he is not negligent". There is no guarantee that a future court case would have the same result. However, with this precedent, the assumption is that if Operations Branch members administer first aid with reasonable care within the boundaries of their training, they will not be found negligent. The legal basis, however, should be seen as a minimum. Ethically, first aiders should strive for excellence in the skills with which they discharge their duty of care.

Anti-Discrimination

It is illegal as well as unethical to discriminate in the treatment of any person on the basis of race, sex, sexual preference, age or marital status. The only legitimate matter to consider when determining the treatment is the best interests of the casualty. Where there are more casualties than resources, the priorities of treatment must be decided on triage principles.

Sexual Harassment

St John policy recognises that sexual harassment infringes basic human rights of members. It has always been unethical in the world of St John and is now illegal. Sexual harassment damages the victim as well as the perpetrator and also damages morale more broadly. Consequently, Operations Branch is "committed to the elimination of sexual harassment which is broadly defined as unwelcome, unsolicited and unreciprocated conduct of a sexual nature". The policy in relation to members is even more applicable to the treatment of casualties who are inescapably in positions of vulnerability. The first aider must weigh the ethics of the need to treat the injury against the implications of examining intimate areas of the casualty's body. If possible, a person of the same sex as the casualty should be a witness when a person of the opposite sex is giving first aid. Members need to fully understand the Policy and Guidelines on Sexual Harassment.[2] Always explain to the casualty what you are going to do and why you are going to do it. This will prevent the casualty from misinterpreting your actions.

Child Protection

Similarly, the St John Child Protection Policy (see Appendix) recognises that "children have rights as individuals and should be treated with dignity and respect". It requires all adult members to take every reasonable precaution to protect children in their care, either as fellow St John members or as casualties, from harm of every kind. Some St John members also have a legal mandatory responsibility to report child abuse. Again, all members need to be familiar with the Policy, Procedures and Guidelines on Child Protection.[3]

Research

St John also has a Research Policy4 under which its Research Ethics Committee approves and monitors research projects undertaken under its auspices. The Committee's role is to ensure that ethical standards are met, according to the Declaration of Helsinki of 1964 and the National Health and Medical Research Council Guidelines. It also has a duty to protect the interests of the research subjects, the investigators and St John Ambulance Australia. Where research is undertaken, the informed consent of subjects must be obtained and subjects must be free to withdraw from the research at any stage without detriment.

Consent

Wherever possible, the consent of the casualty should be obtained before the first aider gives treatment. In fact the Casualty Report OB12 form makes provision for the casualty to sign if he or she refuses treatment. In the case of the unconscious victim, there may be a relative who can give consent on behalf of the casualty. But ultimately the first aider has to weigh the implications of not intervening against the implications of acting without consent and will almost always proceed to treat the unconscious casualty. If the first aider does no more than protect the casualty from worsening of injury, it may be a worthy contribution.

Privacy

Once the first aider decides to give first aid, the privacy and dignity of the casualty must be respected. At the outset, the first aider introduces himself or herself and asks the casualty's name, not only to check the casualty's state of consciousness but also to reassure the casualty that care is being provided by a caring and professional human being, not an impersonal operator. The casualty should not be exposed needlessly to the view of bystanders. Casualties should not be embarrassed or humiliated by remarks made in their hearing or by actions that take no account of social, cultural or religious sensitivities. For many Australians of Asian origin, for example, touching the top of the head is culturally inappropriate.

After first aid is administered, the first aider must respect the right of the casualty to confidentiality, just as doctors and nurses honour the confidentiality of patient records. The casualty's permission should always be sought, for example, if the first aider wishes to use details of the incident, or photographic material from it, for later training purposes. This can usually be sought later, after the immediate drama of an incident has passed.

Confidentiality

There are both ethical and legal responsibilities concerning confidentiality. These apply to the communication of information, oral, written or electronic, about a casualty. Similar constraints apply also to some information, such as medical data, about fellow St John members.

It is important that casualties feel comfortable about telling first aiders their personal details. Sometimes this conveys very sensitive information. Casualties will withhold it if they feel it will not be treated with discretion. Hence it is important that such information be confidential and be seen to be treated with confidence. Do not discuss the details of casualties with inappropriate people, simply for casual interest. It is proper, of course, to discuss details of management of injuries or illness with other health professionals but never in front of other casualties or bystanders. If your family or friends, away from the public duty, ask you about casualties you have treated, inform them that you do not disclose such information, on ethical grounds. Indiscreet use of information can undermine the casualty's trust in the first aider and jeopardise community attitudes to St John as a first aid organisation.

Under privacy legislation, a record-keeper who has possession of a record that contains personal information that was obtained for a particular purpose should not use that information for any other purpose unless:

- the individual concerned has consented to the use of the information for that other purpose; or
- the release of the information is authorised by law.

Operations Branch members on public duty who receive requests for information about casualties whom they have treated should refer the request to the senior member on duty. As a general rule, no information concerning a casualty should be released to another person or to the media without the consent of the casualty or the casualty's legal guardian. On many occasions, people requesting information relating to casualties treated by Operations Branch members should be asked to put their requests in writing, addressed to the District Medical Officer, along with details of their authority to seek the information and the reason it is sought. The Chief Medical Officer, in a circular of 19 September 1997 to District Medical Officers, set out the principles and guidelines for the release of information from the OB12 form. It contained the following statement:

> *In principle each district is required to conform with local legislative requirements. The person requesting the information must have a legitimate reason for the request. The release of the information can only be with the written approval of the casualty. If the casualty is a minor, the approval for the release of the information must be from a person responsible for the casualty. The District Medical Officer (or Medical Officer nominated by the Commissioner) should be advised of the request for a copy of an OB12. Members are requested to adhere to these principles.*

Generally, casualties have the right to see records that contain personal information about themselves and so the pink copy of the OB12 form goes with the casualty. This form is also available to other health professionals, including ambulance officers, who may be involved in the continuing care of the casualty. The OB12 copy retained by the first aider and the original filed by the division or district must be kept under adequate security. Whenever the original is sent elsewhere, for appropriate purposes as, for example, with a subpoena in court, a copy should be kept at the division or district headquarters. Similar confidentiality principles apply to members' records.

Legal aspects of some ethical situations are covered in more detail in the St John Management Modules Q and R, Human Rights and Legal Constraints.

Exercises

1. Discuss the situations in which the first aider might be required to make an ethical decision and the principles which should be applied.

2. How should the first aider react to the following situation?
   First aid treatment has been given at the scene of a car accident, in which two people have been seriously injured. What information should the first aider give to:
   - the ambulance officer attending the accident?
   - a close relative of the injured?
   - a newspaper reporter?

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1 Cattley v St John Ambulance Brigade (Unreported, Queens Bench Division, 25 November 1988 before Prosser J)
2 St John Ambulance Australia (1995). *Policy - Sexual Harassment and Guidelines on the Prevention and Elimination of Sexual Harassment*.
3 St John Ambulance Australia (1997-8). *Child Protection Policy, Procedures and Guidelines for Adults.*
4 St John Ambulance Australia (1998). *Research Policy.*

RECORD OF SKILL MASTERY - 1999

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	
1.1	❐	❐	❐		Examiner's name .... Examiner's Signature Position ....
5.1	❐	❐	❐		Examiner's name .... Examiner's Signature Position ....
6.1	❐	❐	❐		Examiner's name .... Examiner's Signature Position ....
7.1	❐	❐	❐		Examiner's name .... Examiner's Signature Position ....
8.1 8.2 8.3	❐ ❐ ❐	❐ ❐ ❐	❐ ❐ ❐		Examiner's name .... Examiner's Signature Position ....
9.1 9.2	❐ ❐	❐ ❐	❐ ❐		Examiner's name .... Examiner's Signature Position ....

Glossary

acute myocardial infarction:	death of heart muscle, caused by blockage of a coronary artery.
dehydration:	shortage of water in the body tissues; it may arise from inadequate fluid intake or from excessive fluid loss.
glucometer:	a small portable machine that the patient uses to check the level of glucose in his/her blood.
hypoglycaemia:	condition of abnormally low level of sugar (glucose) in the blood, which starves the brain; it causes weakness, sweating and mental confusion.
hypoxia:	a deficiency of oxygen in the tissues.
immuno-suppression:	a suppression of the immune response, usually by disease or drugs.
incontinence:	failure or inability to control evacuation of the bladder or bowel, or both.
lymphatic system:	a network of vessels that conveys electrolytes, water, protein etc. in the form of lymph from the tissue fluids to the blood stream.
microorganism:	any organism too small to be visible to the naked eye.
palpation:	the process of examining part of the body by careful feeling with the hands and fingertips.
paradoxical breathing:	breathing movements in which the chest wall moves in on inspiration and out on expiration, in reverse of the normal movements.
passive movement:	movement not brought about by the casualty's own efforts.
pneumonia:	inflammation of the lungs, generally due to bacterial or viral infection but also to particulate matter of gases.
recovery position:	in a stable position on the side.
stridor:	a high pitched vibrating noise on inspiration associated with upper airway obstruction.
symbiosis:	an interaction between two different organisms living in close physical association, usually to the advantage of both.
ventricular fibrillation:	a condition in which the contractions of the heart muscle are uncoordinated so that the heart quivers or twitches and therefore does not pump blood.

ST JOHN AMBULANCE AUSTRALIA

CHILD PROTECTION POLICY

The following Policy was adopted by National Council on 6 December 1997.
It was slightly amended and the accompanying Guidelines for Adults and Procedures were adopted by Nationa Council on 26 June 1998.

As a voluntary organisation working with children, St John Ambulance Australia:

- recognises that children have rights as individuals and should be treated with dignity and respect;
- believes that children have the right to be emotionally and physically safe at all times;
- takes all reasonable precautions to protect the children in its care from harm of every kind;
- makes all adult members aware of their child protection responsibilities;
- cooperates with governmental child protection agencies.

For the purposes of this policy, 'children' refers to all persons under 18 years of age.

1. To implement these principles, St John Ambulance Australia will, in respect of its activities:
   - carefully apply standards of fitness for membership to recruits and especially those appointed to positions of responsibility for activities involving children associated with Operations Branch or with child clients of Training and Community Care Branches;
   - appoint and train the Chief Superintendent and District Superintendents in Operations Branch and State/Territory Chairmen in Training and Community Care Branches and such other Child Protection Officers as are considered necessary or are required by law;
   - ensure ongoing support for victims of child abuse is provided;
   - balance the need to protect children in its care with the individual rights of those against whom allegations are made.

2. St John Ambulance Australia will:

   (a) prepare and update *Guidelines for Adults* which:
   - outline the varieties of child abuse and means of detecting them;
   - suggest preventative supervisory practices which provide a balance between protecting the child and guarding the reputation of the supervising adult;
   - promote the education of children in protective behaviours.

   (b) establish *Procedures* to:
   - describe the role of Child Protection Officers;
   - ensure that suspicions or allegations of child abuse are promptly acted upon and are handled in a legal and consistent manner;
   - set out the steps to be taken by a St John member who has suspicions or evidence of child abuse;
   - inform the relevant authorities of any suspicions or evidence of child abuse, whether inside or outside the St John organisation;
   - maintain confidentiality in relation to reported incidents.

These Guidelines and Procedures will be prepared nationally, in consultation with the States and Territories, within the framework of this policy. They will be modified as necessary to meet the requirements of State/Territory legislation.

GUIDELINES FOR ADULTS

A. AIMS

1. These Guidelines aim to enable adults within St John Ambulance Australia to carry out their responsibilities for child protection as set out in the Child Protection Policy and Sexual Harassment Policy and Guidelines. They also aim to establish a safer environment for young people in their care, other adults and the members themselves.

2. Reference to children in St John policy, procedures and guidelines includes all people under the age of eighteen who are involved in the activities of St John or are receiving services from St John. It is recognised that under some legislation young people approaching the age of eighteen are not treated as minors but no such exceptions are made in these Guidelines.

B. THE NATURE OF CHILD ABUSE

3. Child abuse is an exploitation of the power adults have over children. Child abusers will often manoeuvre themselves into positions of trust in order to gain access to children. They often evade screening processes. In a large majority of reported incidents the abuser is someone known to the child, often someone the child trusts.

4. Children are vulnerable regardless of gender, culture, class, religion, race or disability. While a small minority of adolescents may make allegations through vindictiveness and some young children can imagine themselves to be victims, these are isolated occurrences. Children seldom make false accusations of abuse. In fact, it is more likely that they will deny any abuse or take back their accusations. Abused children often feel, or are told by the abuser, that they are to blame and will try to hide their unhappiness and distress.

5. The following behavioural indicators may identify a child who has been abused. However, it is important to look for patterns of indicators. One or two indicators alone may not necessarily mean that a child has been abused, but may indicate that something is wrong.

   (a) **Physical Abuse**

   Physical abuse is commonly characterised by physical injury resulting from practices such as punching, beating, shaking, biting, burning or otherwise harming a child.

   Physical injuries to a child, however slight, may not necessarily be the result of an accident. The injury may have been deliberately inflicted or knowingly not prevented. Bruising may be on areas of the body not generally seen and may be noticed in activities such as swimming. The member needs to consider whether the injury is expected in relation to the child's age.

   The physically abused child may:
   - be unusually wary of physical contact with adults;
   - be unduly frightened of a parent or a caregiver;
   - express little or no emotion when hurt;
   - be unduly compliant, shy, withdrawn, passive and uncommunicative;
   - offer unlikely explanations of injuries;
   - be unusually nervous or somewhat hyperactive, aggressive, disruptive and destructive (both to self and others).

   (b) **Emotional Abuse**

   Emotional abuse tends to be a chronic behavioural pattern directed at the child where the child's self esteem and social competence are undermined or eroded over time. A child can also experience emotional abuse by being exposed to a dysfunctional environment which includes domestic violence.

   Persistent insults, ridiculing, absence of affection and excessive discipline by the parent or caregiver can indicate emotional abuse. Bullying by peers is another form of emotional abuse.

The emotionally abused child may:
- be unduly compliant, passive and undemanding;
- have very low self esteem;
- be extremely demanding, aggressive and angry;
- be anti-social and destructive;
- be depressed and suicidal;
- be attention seeking.

(c) **Neglect**

Neglect is characterised by the failure to provide for the child's basic needs. This can occur through direct and deliberate action or by omission .

Persistent neglect can result in serious impairment of the child's health or development. Undernourishment, untreated illness or injuries, persistent tiredness and lack of hygiene and appropriate clothing can be signs of neglect. For example, the child may repeatedly not be collected from meetings of the division.

The neglected child may:
- be indiscriminate in his or her affection;
- be constantly miserable or irritable;
- be withdrawn, pale and listless;
- beg or steal food;
- engage in delinquent acts, vandalism, drug and alcohol abuse;
- have poor social skills and be alienated from peers.

(d) **Sexual Abuse**

Sexual abuse occurs when someone in a position of power over a child uses that power to involve the child in sexual activity over a range of behaviours from sexual suggestion to intercourse.

Sexual abuse involves dependent, developmentally immature children and adolescents in sexual activities they do not truly comprehend, to which they are unable to give informed consent or that violate the social taboos of family rules.

The sexually abused child may:
- use inappropriate language;
- know more about the subject than is normal for the age;
- show protective behaviours such as wearing additional clothes.

The sexually abused adolescent may:
- exhibit delinquent or aggressive behaviour;
- show signs of depression;
- display self-injurious behaviour including:
- drug and alcohol abuse;
- self mutilation;
- attempts at suicide;
- prostitution.

However, members should not jump to conclusions or be overly suspicious. Many children may demonstrate one or more of the symptoms at some stage. Unless there are more definite disclosures or allegations, the member should concentrate on preventative actions such as those following.

C. PREVENTATIVE SUPERVISORY PRACTICES

6. All St John personnel should take all reasonable measures to avoid potentially risky situations or opportunities for allegations/misunderstandings. Such situations can, for example, occur in training or administration of first aid. There needs to be a balance between protecting the child and guarding the reputation of the supervising adult.

7. It is recognised that volunteers providing respite for caregivers of children with disabilities may be unable to meet the following codes of behaviour by the very nature of their work. In these situations, volunteers must be selected with particular care and their interaction with clients regularly reviewed by supervisors.

8. Practices to be avoided include:

- being in one-to-one situations with a child in an enclosed space; where such a situation is unavoidable, keep a door open or ensure another adult is close by;

- having cadet officers running a division single-handedly; ensure an appropriate balance of male and female helpers;

- where residential events are concerned, supervisors should go to children's quarters unaccompanied only when this is essential and unavoidable;

- showing favouritism or singling out individuals on a regular basis;

- using inappropriate language and subject matter;

- dismissing or trivialising bullying;

- using bullying behaviour to manage children or maintain discipline.

9. Practices to be adopted include:

- ensuring, when working within a school, that a teacher is present within a reasonable distance;

- being aware of children's sensitivity during first aid practical work:
  - give prior notice so that children wear suitable clothing;
  - avoid touching the child; demonstrate on a colleague with their pre- arranged permission or ask an experienced young person to demonstrate with a peer, preferably of the same sex;

- ensuring, as, for example, in first aid training where physical contact is unavoidable, that another adult is present;

- seeking ways to provide comfort and support, where a child is upset, without an unnecessary degree of physical contact;

- giving thought to the arrival and departure of children at St John events:
  - be there before they arrive;
  - do not leave the premises until all children have been collected;
  - do not drive or walk a child home without prior parental permission;
  - do not take a child to your home;

- involving cadets and juniors in establishing their own list of rules, outlining what is and what is not acceptable in a division.

D. EDUCATING CHILDREN

10. Education of both adults and children is the primary means of promoting child protection. The aim of an education programme should be for the child:

- to recognise situations that may result in abuse;

- to be able to assert the right to resist the abuser;

- to set up a network of trusted adults;

- to feel confident that an adult will take action to prevent further abuse.

11. Child protection is a State/Territory, not a Commonwealth, responsibility. As part of cooperation with governmental agencies, each State/Territory should establish the legislative requirements of child protection for its State/Territory. Where governmental authorities, such as Education Departments, have a responsibility to teach protective behaviours to children, St John members should establish the nature of that responsibility and obtain copies of Child Protection documents available.

12. If governmental authorities do not have responsibility to teach protective behaviours to children, it may be necessary to develop, in association with parents, an education programme for such children in St John care. Such a programme should only be taught by appropriately trained persons, according to the State/Territory child protection agency requirements. Supervisors may be able to reinforce such an education programme when queries arise.

13. Without creating undue fear or alarm, children should be made aware:

    - of potential dangers and how to avoid them;

    - of the difference between feeling safe and feeling uncomfortable or scared;

    - that they should not have to accept touching, kissing or language which makes them feel uncomfortable;

    - of their right to say 'no' if someone, even someone they know well, tries to touch them in a way that frightens or confuses them;

    - that they should not talk to strangers or accept presents or lifts in cars from them;

    - not to hitch-hike;

    - to travel with friends rather than alone;

    - that, if in trouble, they should seek an appropriate authority figure such as a police officer or teacher;

    - that sometimes it is necessary to scream and shout to attract attention or be rude to a potential abuser if they think they are in danger;

    - that some secrets are wrong and should not be kept;

    - that adults will listen to them and believe them if they reveal a secret.

PROCEDURES

A. THE ROLE OF STATE/TERRITORY COUNCILS

1. Child protection is the legislative responsibilty of State and Territory Governments. Councils need to be aware of local legislative requirements and notify National Headquarters if these are inconsistent with the St John Policy, Guidelines and Procedures. It may be necessary to modify aspects to meet local requirements but National Headquarters needs to be aware of these modifications. Consequently, the following procedures should only be applied if they are consistent with State/Territory legislation. Also, appropriate internal State/Territory coordination, involving chief executives and Branch officers, is very important in handling child protection cases.

2. **State/Territory chief executives**, on behalf of Councils, have the following responsibilities in relation to child protection;

   - to liaise with Branch Heads on the selection processes for those who supervise children;
   - to keep a register of appointed Child Protection Officers for their State/Territory;
   - to assist in arrangements for the training of Child Protection Officers in their roles and responsibilities; and
   - to facilitate the handling of allegations of child abuse and to keep National Headquarters informed of developments.

B. THE ROLE OF BRANCH HEADS

3. **Branch Heads** have the following responsibilities in relation to child protection:

   - to arrange for careful selection of those who supervise children;
   - to appoint Child Protection Officers and arrange for notification to State/Territory chief executives and National Headquarters;
   - to arrange for the training of Child Protection Officers in their roles and responsibilities;
   - to facilitate the handling of allegations of child abuse and keep State/Territory chief executives fully informed; and
   - if necessary and according to the principles of natural justice, to suspend the member against whom the allegations of child abuse have been made.

C. THE ROLE OF CHILD PROTECTION OFFICERS

4. Child Protection Officers are responsible for:

   - being aware of the St John Child Protection Policy, Procedures and Guidelines and the legislative child protection requirements in their State/Territory;
   - if appropriate under the State/Territory legislation, receiving complaints and reporting to the relevant authorities any suspicions or evidence of child abuse which may be the subject of Commonwealth or State legislation, whether or not there is a requirement for mandatory reporting;
   - undertaking a support role to any person who has made a report;
   - if appropriate, undertaking a support role to the alleged victim and family;
   - informing appropriate senior officers at State/Territory level of any suspicions or evidence of child abuse;

- liaising with governmental agencies responsible for child protection in expediting the management of allegations of child abuse;

- otherwise, maintaining confidentiality in relation to reported incidents; and

- assisting with the education of adults in preventative supervisory practices.

D. THE ROLE OF MEMBERS

5. **Each St John member** is to be aware of the St John Policy, Guidelines and Procedures on Child Protection. Legislation on mandatory reporting varies across States/Territories but in some cases St John members may have a mandatory responsibility to report child abuse. For example, medical practitioners, registered nurses, teachers, creche workers, youth, social and welfare workers and court officers should get legal advice as to whether they have a mandatory reporting role in their employment and whether this carries over into their St John roles.

6. The St John member who has suspicions or evidence of child abuse will:

   - keep an accurate and factual written record and ensure that it is disclosed only to those, such as Child Protection Officers and investigating government officials, with a right to know;

   - refrain from investigation, as this could compromise evidence for legal proceedings; this includes pressure on the child to give details; the member's role is to listen to what the child wants to say;

   - inform the child protection agency as soon as practicable after the suspicion is formed;

   - inform as soon as possible a designated Child Protection Officer;

   - seek advice from a Child Protection Officer on whether the parent/caregiver should be contacted;

   - in cases of serious and immediate risk to the child, contact the police;

   - follow up oral referrals in writing within 24 hours;

   - ensure that the child is provided appropriate and ongoing support;

   - refrain from making statements to the media unless authorised at State/Territory level and then with an authorised text;

   - be ready to provide evidence under properly constituted legal processes.

7. If a child makes allegations of abuse, the member should:

   - reassure the child that he or she is being taken seriously and what is being said is believed, e.g. 'I believe you', 'It's not your fault';

   - explain that the information should be revealed to the appropriate authority so that the abuse does not recur, e.g. 'I'm going to help you';

   - as soon as possible, make an accurate and factual written record (using the child's actual words if possible) of the disclosures and anything witnessed.

26 June 1998

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 check ❐ ❐ ❐ ❐ ❐ ❐ ❐ ❐ ❐ ❐

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 .... / .... / 1999.

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

DECLARATION OF CONTINUED FITNESS FOR PUBLIC FIRST AID DUTIES

The following Policy on Fitness for Duty was issued as part of Chief Commissioner's Order 2/96 of 7 February 1996:

1. *First aid skills and knowledge will be tested annually by the Skills Maintenance Programme.*
2. *As a test of physical fitness, members will be required annually to satisfactorily perform 10 minutes of cardiopulmonary resuscitation on a manikin, as part of their skills assessment. Members unable to pass this screening test must be referred to the Divisional or Corps Medical Officer or medical officer nominated by the District Medical Officer for counselling before retesting after an appropriate interval.*
3. *Members must sign an annual Declaration of Fitness, incorporated in the Skills Maintenance Programme, which states that there has been no change in their medical fitness to perform public first aid duties. If there has been a change, the member is to return the Statement to the Divisional Medical Officer in a sealed envelope marked "Medical in Confidence"; or , if there is no Divisional or Corps Medical Officer, directly to the District Medical Officer. The statement should briefly outline the reasons, medical or surgical, for the change and whether the condition is likely to be temporary or permanent.*
4. *If a medical examination is needed, both the member and the St John Medical Officer are governed by the General Fitness Standards for Membership. The medical officer may place the member on restricted duties for a specific period. Fitness will be reassessed at the end of that time.*
5. *A member deemed unfit has the right of appeal to the District Medical Officer or to a medical officer nominated by the Commissioner.*

The Superintendent/Officer-in-charge is to send the bottom section of this page to the District Medical Officer at Headquarters. If not able to declare continued fitness, the member is to make a separate statement outlining the reasons, medical or surgical, for the change and whether the condition is likely to be temporary or permanent and send it to the appropriate Medical Officer in a sealed envelope marked "Medical in Confidence".

Cut Here

DECLARATION OF CONTINUED FITNESS FOR PUBLIC FIRST AID DUTIES

I declare that there has been no change in the last year in my medical fitness to perform public first aid duties.

Signed.. / /1999

The member has satisfactorily demonstrated his/her fitness.

Signed.. / /1999

Superintendent/Officer-in-charge

OR

There has been a change in the last year in my medical fitness to perform public first aid duties which I will report in confidence to the Divisional, Corps or District Medical Officer.

Signed.. / /1999

Printed name and address...

....

CONFIRMATION OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME, 1999

Name (please print)..
Family name

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

Signed...Date............/............/199..........
Member to sign when Programme completed

The above member has completed the programme to my satisfaction:

....Date............/............/199..........
Person responsible for training, print name and address and sign

....Date............/............/199..........
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............/............/199..........
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 District Medical Officer. **A record of receipt will be held at District Headquarters.**

Cut Here

ADVICE OF COMPLETION OF SKILLS MAINTENANCE PROGRAMME, 1999

This is to advise that
Name (please print)..
Family name

of...Division who joined St John ..../............/199..........

has completed the Skills Maintenance Programme for 1998. 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............/............/199..........

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............/............/199..........
Training Branch Accredited Instructor, print name and brief address and sign