

Remote Area Nursing Emergency Guidelines

Fourth Edition 2005



Department of
Health

EMERGENCY NUMBERS

Please take the time now to enter any numbers you may need in an emergency

Local Ambulance

Local Fire Service

Local General Practitioner

Local Police

Local/Regional Hospital

Burns Unit (Royal Perth Hospital) (08) 9224 2153

Bush Crisis Line 1800 805 391

Child Sexual Abuse Unit (Princess Margaret Hospital) (normal hours) (08) 9340 8646

• After hours page the Social Worker (08) 9340 8222

Delivery Suite (King Edward Memorial Hospital) (08) 9340 2199

Diver Emergency Service 1800 088 200

Kids Help Line 1800 551 800

Marine Stingers (24-hour medical advice) 13 11 26

Poisons Information Centre 13 11 26

Princess Margaret Hospital (08) 9340 8222

Psychiatric Team (24-hours) 1800 676 822

Royal Flying Doctor Service (Western Operations) 24-hour advice 1800 625 800

Sexual Assault Resource Centre (08) 9340 1828

• Country callers 1800 199 888

Health Direct 1800 022 222

OTHER:

Remote Area Nursing Emergency Guidelines



Department of
Health

Fourth Edition 2005

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FOREWORD

Welcome to the Fourth Edition of the *Remote Area Nursing Emergency Guidelines*. This edition's format continues the user-friendly approach and was developed in consultation with remote area nurses.

The guidelines are divided into five sections: *General Information, Assessments, Emergency Interventions, Procedures and Other Information, and Medications*. You will notice that each section is cross-referenced and colour coded for efficient access. Each of the sections in this edition have been extensively reviewed and updated following wide consultation.

Wide consultation with clinical practitioners, including emergency department clinical nurse specialists and remote area nurses, was undertaken to ensure the guidelines contained in this manual have practical application. The success of the manual has only been made possible by their collective contributions.

The *Remote Area Nursing Emergency Guidelines* are only to be used if it is not possible to contact a medical practitioner and/or immediate treatment is necessary in order to save a person's life or prevent serious injury to a person's health. Additionally the 'STANDING ORDERS FOR (DESIGNATED) REMOTE AREA NURSING POSTS' apply, and remote area nurses should be familiar with the orders issued under regulation 36(1)(d)(ii) of the *Poisons Regulations 1965*.

The remote area nurse's attention is drawn to the issue of professional indemnity and malpractice and a full description of these areas is contained in the section on "Legal Issues".

New to this edition is a copy of the *Scope of Nursing Practice – Decision Making Framework*, which has been reproduced with permission of the Nurses Board of Western Australia. The framework should be consulted regarding the guiding principles to both expanding the scope of nursing practice and the delegation of care.

Carol Pinch, Senior Nursing Officer, is acknowledged for her dedicated approach in updating this edition.

I take this opportunity to wish you continued success in providing outstanding service to rural and remote communities in Western Australia.



Adj Professor, Dr Phillip Della
Chief Nursing Officer
Department of Health Western Australia
July 2005



NOTICE:

As research and clinical experience is constantly advancing our knowledge of new treatments and medication, changes in our clinical practice are necessary. Readers are encouraged to follow the safety precautions and check the most current medication product information to verify the recommended dose, the method and duration of administration and contraindications.

It is the responsibility of the practitioner relying on experience, and knowledge of the patient to determine the best treatment. While all care has been taken to ensure that the information is correct at time of publication, readers should verify the information. Neither the publisher nor the editor assumes any liability for any injury and / or damage to persons or property arising from the information contained in this publication.

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INDEMNITY AND MALPRACTICE

PUBLIC SECTOR

This section is intended to provide a general overview regarding employee indemnity. Nurses seeking indemnity in respect of a claim or legal proceedings should contact the Legal & Legislative Services Directorate for further advice. Officers from this Directorate can then provide legal advice that is specific and relevant to the particular case.

THE STATE GUIDELINES

The State Government's "Guidelines relevant to Ministers & Officers involved in Legal Proceedings" ("**1990 Guidelines**"), tabled in the Legislative Council on 10 July 1990, sets out what has long been government policy, namely that, in the ordinary course, government employees will on an ex gratia basis be indemnified in respect of litigation against those employees arising out of conduct in the course of their employment unless the conduct giving rise to the relevant claim is of such a nature as not to justify indemnification.

In particular, the 1990 Guidelines provide:

1. **in relation to civil proceedings issued against Ministers & Officers** – that Ministers and Officers will be indemnified if their conduct "was in good faith and reasonable" and in the discharge of official responsibilities. The Guidelines emphasise

that each case will be decided on its merits and the "reasonableness" test will not be applied harshly.

2. **in relation to criminal proceedings instituted against Ministers & Officers** – that Ministers and Officers under charge are generally expected to obtain their own legal advice and provide for their own representation. However, at the conclusion of proceedings, Ministers and Officers may seek reimbursement of their reasonable legal costs. A decision regarding reimbursement will be made following an assessment of the individual's conduct as indicated in the proceedings and the surrounding circumstances to determine whether it was in good faith, reasonable and in the discharge of official responsibilities.

The protocol to be followed where legal proceedings affecting individuals arise is set out in the 1990 Guidelines in some detail. Key features of the 1990 Guidelines include:

- Being policy, the guidelines have some flexibility in application and are not intended to have contractual effect.
- The issue of indemnification is approached in a commonsense, practical way and on the basis that, while each claim's circumstances should be properly investigated and considered, employees acting in good faith, albeit perhaps negligently, will

ordinarily be indemnified in relation to legal proceedings brought against them.

- In some situations, a decision regarding legal representation can be made at the commencement of proceedings or during them. For example, where it is evident the proceedings are frivolous and vexatious.

RISKCOSY LIABILITIES COVER

Most employees will be aware of the RiskCover managed fund that self-insures the government's public authorities, such as hospitals and health services. Broadly speaking, RiskCover will pay to, or on behalf of, public authorities all sums which the public authority becomes legally liable to pay in respect of claims made against it.

Cover provided by RiskCover includes not only the payment of any damages/compensation the public authority becomes legally liable to pay but also:

- any legal costs incurred by RiskCover in the settlement or defence of such claims or litigation; and/or
- any legal costs recoverable by the claimant from the public authority.

Liability cover is provided to the public authority itself and not directly to employees. It is the public authority that provides cover to its employees. This cover includes the personal liability of employees, volunteers and officers of the public authority, secondees, work experience persons and medical students whilst

acting in their official capacity, performing a statutory function or performing a function/task requested by the Minister for Health or the public authority.

Liability cover provided by RiskCover is subject to the various limitations set out in its Fund Guidelines. For example, coverage is generally not provided for loss, damage or liability due to an unlawful activity by a public authority or as a result of the authority's dishonest, fraudulent, criminal or malicious act or omission.

All queries with regard to the indemnity cover applying to employees should be directed to Legal & Legislative Services, Department of Health, 189 Royal St, East Perth 6004. Telephone 9222 4038.

PRIVATE SECTOR

Self-employed or employed nurses in the private sector are not covered by the RiskCover policy.

Self-employed nurses may need to consider taking out professional indemnity insurance.

Nurses working in the private sector should seek their own independent legal advice as to insurance cover.

SCOPE OF PRACTICE

The scope of practice of a nurse is defined by:

- the *Nurses Act 1992* (WA)
- the *Nurses Rules 1993* (WA)
- the *Nurses Code of Practice 1995* (WA)
- standing orders issued under the *Poisons Act 1964* (WA) and
- other relevant legislation such as the *Poisons Regulations 1965* (WA).

Under the *Poisons Act 1964* (WA) and pursuant to regulation 36(1)(d)(ii) of the *Poisons Regulations 1965* (WA), a registered nurse practising nursing at a designated remote area nursing post may supply certain poisons in the following circumstances:

- the site is to be designated by the Commissioner of Health as a remote area nursing post

- supply is only relevant to Schedule 4 poisons specifically listed in the standing orders and excludes psychoactive poisons
- supply must be by a registered nurse working at a designated remote area nursing post
- supply must be for the treatment of an acute medical condition specified in the standing orders and
- supply must comply with the written standing orders signed by a medical practitioner and approved in writing by the Commissioner of Health.






EMERGENCY GUIDELINES

The Remote Area Nurse Emergency Guidelines are only to be used if:

- it is not possible to contact a medical practitioner
- immediate treatment is necessary in order to save a person's life or to prevent serious injury to a person's health.

HOW TO USE THESE GUIDELINES

In an emergency situation you need to find things as quickly as possible. These guidelines have been designed to help you do just that. Here's how it works:

- **FIVE SECTIONS** are used to store the information
 1. General information  (no colour)
 2. Assessments  (Green band)
 3. Emergency Interventions  (Red band)
 4. Procedures and Other Information  (Tan band)
 5. Medications  (Purple band)
- **COLOUR CODING**

Four of the sections have a band of colour on the edge of each page in the section. The colour coding allows each of the sections to be identified easily. Once you are familiar with the colours for each section you will be able to go straight to the section you need.
- **SEQUENCING OF TOPICS**

Where possible, topics are alphabetical. In some cases, the importance of the topic or its relationship to a preceding topic dictate its position
- **SHADING/CAPITAL LETTERS**

Important information is shaded and/or appears in capital letters.
- **LINKS**

The colour coding and page numbers are used to link information from different sections together.
For example:
If you are working through a topic in the Emergency Interventions section and you are asked to use the Glasgow Coma Scale, then a small coloured box with a number in it will identify the page containing the Glasgow Coma Scale information and the colour of the section it is in.
- **TABLE OF CONTENTS**

At the front of the guidelines there is a Table of Contents that lists each section and the various topics within it, along with the page numbers.
- **INDEX**

At the back there is an index that lists all topics alphabetically.

Section One:

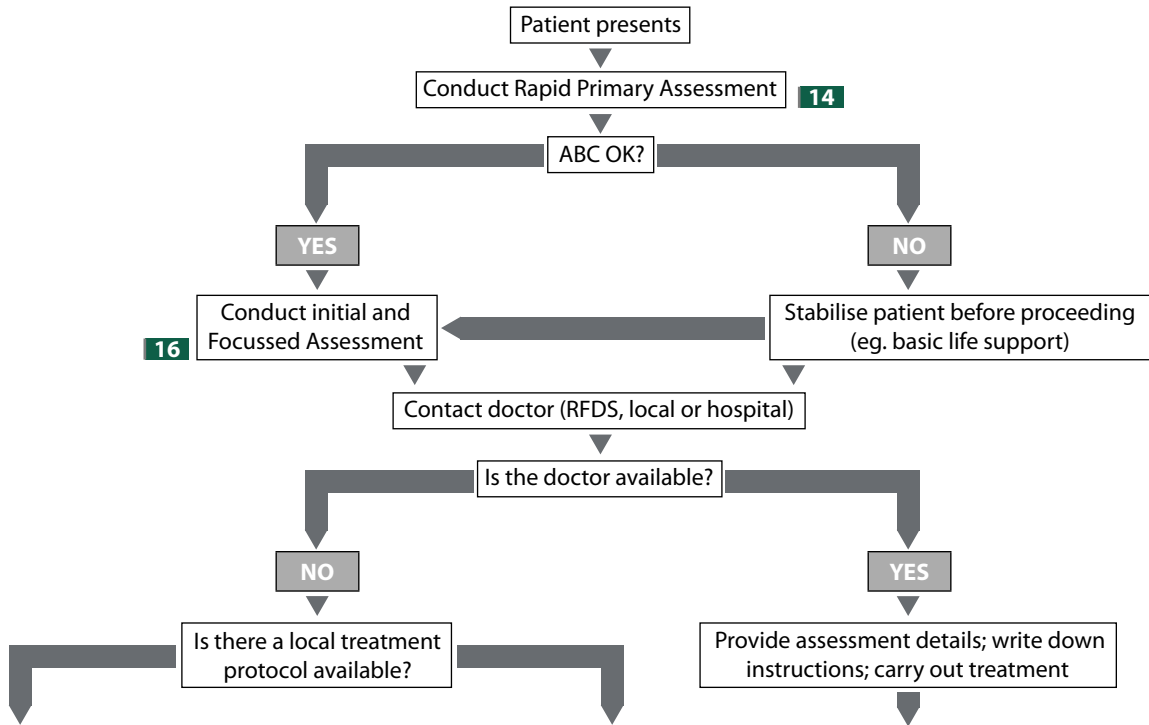
General Information

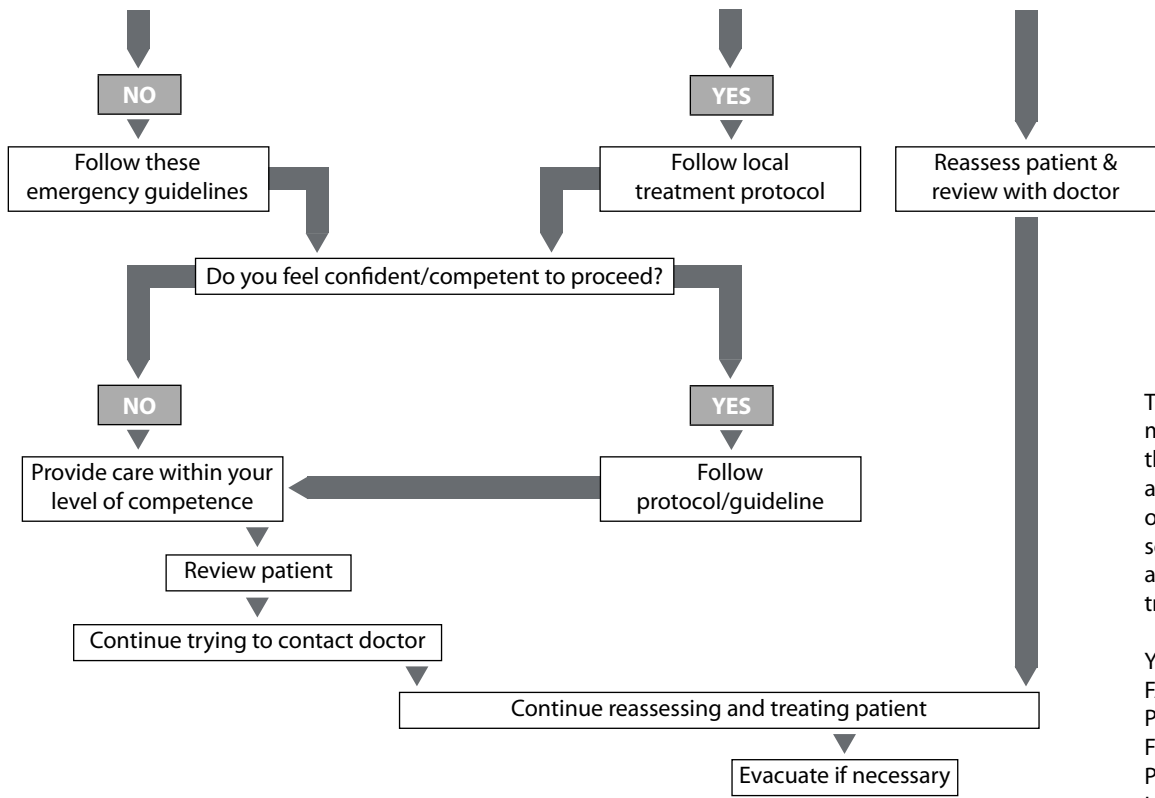
PERSONAL SAFETY

In an emergency situation it is important that you protect yourself from:

- Blood and body fluids
 - Remember to treat all blood and body fluids as being potentially infectious
 - ✓ If your HANDS may be contaminated wear GLOVES
 - ✓ If your EYES may be splashed wear GOGGLES
 - ✓ If your MOUTH may be splashed wear a MASK
 - ✓ If your CLOTHES may be splashed wear a GOWN or PLASTIC APRON
 - ✓ For protection when mouth-to-mouth resuscitation is necessary it is a good idea to carry a mouth-to-mask device (LAERDAL MASK or similar)
- Environmental hazards like fire, fumes, other vehicles, live wires, etc
- Perpetrators of a crime
- Aggressive people

MEDICAL CONSULTATION





The evacuation procedure may vary according to the community's location; availability of RFDS and/or ambulance transport services; and Health Service and RFDS emergency transfer policy/protocol.

YOU NEED TO BECOME FAMILIAR WITH THE LOCAL PROCEDURE AND POLICIES FOR EVACUATION OF PATIENTS FROM YOUR LOCATION.

INFORMATION FOR THE DOCTOR

Once you have carried out the assessment process and any life support measures for your patient contact the doctor. State that it is an emergency and that you are seeking advice and/or evacuation for your patient.

<ul style="list-style-type: none"> ✓ Patient's name ✓ Date of birth, age ✓ Sex ✓ Weight ✓ Unit number ✓ Describe the presenting problem/emergency situation in clear language ✓ Relevant history ✓ Assessment data & clinical findings, such as: <ul style="list-style-type: none"> • Airway • Respirations, including rate, apnoea, grunting, flaring, retracting, stridor, wheeze • Heart rate • Blood pressure • Temperature • Blood sugar level • Neurological Assessment, such as Glasgow Coma Score, other 	<ul style="list-style-type: none"> ✓ Results of any investigations, such as: <ul style="list-style-type: none"> • Electrolytes • Haematology • Coagulation • Arterial Blood Gases • Chest X-ray • Other ✓ Nursing interventions such as medications, oxygen therapy, ventilation ✓ Evaluation of client's response to interventions ✓ Clearly express your opinion of the patient's condition, based on your assessment ✓ Record the doctor's telephone orders in writing <ul style="list-style-type: none"> • If possible ask another nurse/health worker to listen to the doctor's orders ✓ If evacuation is likely, reach agreement with the doctor regarding: <ul style="list-style-type: none"> • the appropriate mode of transport • the need for a suitable escort such as a nurse, police, relative, or doctor
--	--

REMEMBER IT MAY TAKE A LONG TIME (HOURS) BEFORE YOUR PATIENT IS EVENTUALLY EVACUATED, SO MAKE SURE THAT THE PLAN OF ACTION YOU GET FROM THE DOCTOR WILL COVER THIS TIMEFRAME.

AFTER THE EVENT - WAS THAT A TRAUMATIC EVENT OR WHAT?

(contributed by the Bush Crisis Line)

Being involved in events that involve the actual or threatened death or serious injury of self or others may leave remote practitioners vulnerable to experiencing a traumatic stress reaction either during or after the event.

Some events may be more difficult to deal with than others. For example, if the event was sudden, with little time to prepare; if it involved exposure to grotesque images; involved children or people you know or are related to; if you were alone during the event and/or you felt unsure about your chosen course of action, then you may be likely to experience some strong emotional reactions during or after the event. Sometimes events which occur as a result of cruelty or malevolence to other people are harder to come to terms with than those which occur by accident.

Traumatic events are likely to be complex experiences for remote workers. The lack of anonymity of all involved, the public nature of such events, the ripple effects throughout the community, and the issues about confidentiality in small places all work to complicate the situation and how you cope with it. High levels of ongoing stress (home or work-related) can also increase your vulnerability to the impact of job-related traumatic events.

Whether an event is defined as traumatic or just ordinarily stressful depends on how you experience it. If you define it as traumatic then it probably is.

TRAUMATIC STRESS REACTIONS

Traumatic stress reactions are normal human reactions to highly stressful events. Reactions can be mild or strong and may last for hours, days or weeks (although reactions usually start to settle after the first week or so).

Indicators of a traumatic, rather than an ordinary stress reaction, may include one or more of the following:

DURING THE EVENT:

- Intense feelings of fear, horror and/or helplessness
- Feeling unreal, numb, in a daze, or outside of self looking on

AFTER THE EVENT:

- Strong feelings of distress
- Feeling unable to function at work or at home
- Sleep disturbances such as not being able to get to sleep, or having nightmares about the event or other catastrophes
- Feeling unable to go near anyone or anything that reminds you of the event
- Flashbacks or unwanted thoughts about the event keep popping into your mind, causing distress
- Feeling emotionally numb or strangely empty.

While these are NORMAL HUMAN REACTIONS to extremely

stressful events, if you or a colleague experiences one or more of these reactions it is **STRONGLY RECOMMENDED** that one-to-one debriefing/psychological support is sought from a mental health practitioner. This can be done through:

- Telephone counselling with organisations such as **ITIM** (employee assistance services provided by the DOH).
1800 337 068
- Telephone counselling with the **Bush Crisis Line** - a 24-hour service specifically for remote health care practitioners and their families.
1800 805 391

NOTE: Group debriefing is not recommended in small communities where everyone knows everyone else.

RECOVERY AFTER THE EVENT

It is suggested that there is a natural recovery period following traumatic events. Many remote health practitioners may be repeatedly exposed to traumatic events and recovery can become more and more compromised with each event. It is therefore important that you accept responsibility for your wellbeing, seek to maximise your recovery after each event and use the best available resources to avoid paying a high psychological price for the type of work you do.

The aim of supportive interventions is to encourage (but not force) people to talk about what happened and how they felt, to stand and

face their fears, use positive rather than negative coping strategies, and work through their experience until they find some sort of peace with what happened.

In isolated communities where there is not easy access to formal debriefing, you might find it helpful to seek informal telephone support from your peers and to provide that same counsel and listening service to others. It is best, of course, to establish a support network before it is actually needed.

ADDITIONAL RESOURCES

- The CRANA Bush Crisis Line has a booklet available for remote health practitioners and their families to manage traumatic stress reactions. This is available through the CRANA office in Alice Springs by telephoning 08 8953 5244

LEARNING TO RECOGNISE YOUR OWN LEVEL OF STRESS AND ACTING TO MINIMISE IT IS ESSENTIAL SELF-CARE FOR ALL REMOTE AREA NURSES.

CULTURAL CONSIDERATIONS

Management of emergency situations within a community setting has some unique aspects that need consideration. For instance, there will be onlookers. Curiosity is universal but dealing with it adequately requires specific information and sensitivity. The following snippets of information come from experienced Remote Area Nurses who have worked in Aboriginal communities.

- Expect to function with an audience. Working behind closed doors may cause suspicion and misinterpretation. It's advisable to contact the doctor or the RFDS by phone in the presence of the family to avoid misinterpretation. If the outcome isn't what the family want or if an evacuation is delayed, the family can hear you advocating for them on the phone and you are less likely to be blamed for a poor outcome.
- Privacy may or may not be required by the patient. It's most certainly a different concept to the Western notion. It's usually best to ask rather than presume.
- Wherever possible the same gender of health professional and patient should be maintained or, if this isn't possible, it would be important to ask a family member of the same gender as the patient to help with particular procedures.
- Show confidence as you manage the situation.
- Many 'emergencies' occur out of normal working hours, so the Health Worker may not be around to 'translate' the cultural aspects for you. Kinship rules may influence who is able to assist in these circumstances. So identify a suitable person from the family involved and gain his/her confidence, then he/she will control the situation socially and culturally. If this person isn't immediately obvious then ask someone: "who would be the best person to ask for help with this situation?" Where the situation has potential for aggression, this person may also be able to calm/diffuse the behaviour. Priorities may differ from your own. What constitutes a medical emergency may not be treated as such by the patient or his/her relatives.
- Always include the relatives, explain everything you do and ask permission to do it, especially before touching the patient.
- Aboriginal people may feel shy about sexuality issues and exposure of the body to a non-Aboriginal person. Respecting a person's dignity is universal.
- Do not become involved in family and/or community cultural business involving disputes or where differences of opinion are being expressed.

BEREAVEMENT IN ABORIGINAL COMMUNITIES (Sorry Business)

If you are travelling to a remote community during a bereavement time you may find that people are not available. It is best to discuss your planned visit with the community council before travelling. Obviously, it is disrespectful to attend a funeral without being invited by an Indigenous person who is a member of that community.

The period of mourning can be from six to 12 weeks depending on the gender and the age of the deceased. The immediate family set their "Sorry camp" some distance from the main community.

When a person dies, the deceased person's name cannot be mentioned. It is considered taboo and it may be that non-Aboriginal staff be sensitised. For example in the Eastern Goldfields and Central Desert region, a person with the same christian name would be referred to as Kumana, in the Western Desert area the name would be Naburu.

Aboriginal employees with government agencies are sometimes criticised by their agency for attending a funeral. However, the government agency must be made aware of the traditional practices and the difficulties this may cause the worker in the community. The "funeral attendance" issue has been raised at "Cross Cultural awareness workshops".

WHO TO CONTACT FOR MORE INFORMATION

The nearest Aboriginal Community Controlled Health Organisation.

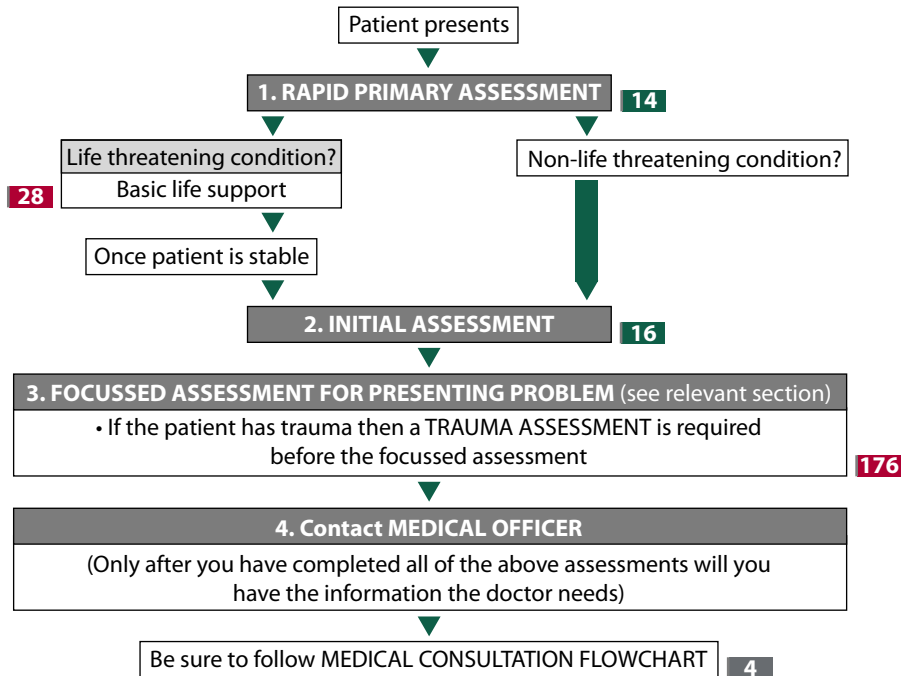
OFFICE OF ABORIGINAL HEALTH
3rd Floor, C Block, 189 Royal Street
East Perth WA 6004
(08) 92224441

Section Two:

Assessments

UNIVERSAL ASSESSMENT PROCESS

Follow this assessment process for each patient who presents for treatment.



RAPID PRIMARY ASSESSMENT

This assessment is conducted as a first priority when the patient presents. Work through it quickly and systematically.

AIRWAY	
<ul style="list-style-type: none"> · Airway <ul style="list-style-type: none"> - patent - compromised 	
LIFE THREATENING CONDITION	NON-LIFE THREATENING CONDITION
Carry out Basic Life Support 28	Go on to Breathing Assessment

BREATHING ASSESSMENT	
<ul style="list-style-type: none"> · Unremarkable · Shallow/deep · Rapid/slow · Laboured 	<ul style="list-style-type: none"> · Audible wheeze · Apnoeic · Symmetrical/asymmetrical chest movements · Accessory muscles
LIFE THREATENING CONDITION	NON-LIFE THREATENING CONDITION
Carry out Basic Life Support 28	Go on to Circulation Assessment

CIRCULATION ASSESSMENT	
<ul style="list-style-type: none"> • Capillary refill <ul style="list-style-type: none"> - < 2secs - > 2 secs • Colour <ul style="list-style-type: none"> - unremarkable - pale/flushed - mottled - cyanotic - jaundice (check sclera) 	<ul style="list-style-type: none"> • Pulse <ul style="list-style-type: none"> - unremarkable - regular/ irregular - slow/ rapid - strong/weak - not palpable - if pulse palpable at wrist then BP is probably more than 80mmHg systolic - if pulse palpable in groin then BP is probably between 60-80mmHg systolic - if pulse not palpable in groin but palpable in the neck, BP is probably less than 60mmHg systolic (ie. patient is dying)
LIFE THREATENING CONDITION	NON-LIFE THREATENING CONDITION
Carry out Basic Life Support 28	Go on to Disability Assessment
Control any uncontrolled bleeding by applying adequate direct pressure to site or artery, elevating site if possible. Insert 2 X large bore cannula and infuse fluids rapidly.	

DISABILITY ASSESSMENT	
<ul style="list-style-type: none"> • Alert • Confused • Verbal response 	<ul style="list-style-type: none"> • Response to pain • Nil response (may not get a response if the patient is confused) • Pupillary response • Does history of events suggest a cervical spine/spinal injury? If there is a possibility of a cervical spine injury keep head in NEUTRAL position, apply a cervical collar &/or lateral head supports (eg. Sandbags)
LIFE THREATENING CONDITION	NON-LIFE THREATENING CONDITION
Carry out Basic Life Support 28	Go on to Initial Assessment 18

Once you have completed the RAPID PRIMARY ASSESSMENT, if the patient is stable go on to conduct the INITIAL ASSESSMENT (next page)

INITIAL ASSESSMENT

Following the RAPID PRIMARY ASSESSMENT continue with the following:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Vital signs <ul style="list-style-type: none"> – temperature – BP (manual) – pulse – respirations – oxygen saturation if oximeter available – BSL | <ul style="list-style-type: none"> • Ask about: <ul style="list-style-type: none"> – chief complaint (symptom) – associated symptom/s (onset and duration) – precipitating cause/ mechanism of injury (events) (severity of injury will indicate potential problems) – pain score – note body language and facial expressions (eg. grimacing) – for females, date of Last Menstrual Period (LMP) and normal or abnormal Menses |
|--|--|

During the Initial Assessment ALWAYS REMEMBER TO:

- EXPOSE your patient when necessary to conduct your assessment
- Keep the patient WARM
- Get a set of BASE LINE VITAL SIGNS
- Take a full HISTORY (AMPLE)
AMPLE = allergies, medications, past history, last ate or drank, events leading up to presentation
- Do not forget to INSPECT THE PATIENT'S BACK when appropriate. If there is a possibility of spinal injuries log roll the patient

FOCUSSED ASSESSMENT

- Once you have completed the RAPID and INITIAL ASSESSMENTS go on to the FOCUSSED ASSESSMENT, which may include Key Assessment Points, Subjective and Objective Assessments, and Head-To-Toe Assessments. You will find these included with each of the problems in the EMERGENCY INTERVENTIONS SECTION (RED) of the manual
- For ALL patients with INJURIES, follow with TRAUMA ASSESSMENT at the front of the TRAUMA Section

ONCE YOU HAVE COMPLETED THE ASSESSMENT PROCESS AND CARRIED OUT ANY LIFE SAVING MEASURES
CONSULT THE MEDICAL OFFICER AND FOLLOW THE MEDICAL CONSULTATION FLOWCHART **4**

NEUROLOGICAL ASSESSMENT

Conscious state is initially assessed using AVPU. A later, more complete assessment is performed using the Glasgow Coma Scale.

AVPU

A	Alert
V	Responds to V erbal statement
P	Responds to P ainful stimuli
U	No response (U nresponsive)

GLASGOW COMA SCALE - ADULT

The Glasgow Coma Scale (GCS) provides a means to objectively rate a patient's level of consciousness. The scale is based on three parameters: *EYE OPENING*, and *VERBAL* and *MOTOR RESPONSES*. The patient is given a score in each category and the categories are totalled to obtain a total score.

The best score that the patient can obtain is 15, the worst 3. Morbidity and mortality sharply increase for patients with scores of 8 and below. The GCS and all observations must be performed at regular intervals to identify trends

- A persistent GCS of LESS THAN 13 would be a concern and well worth transfer to hospital
- A persistent GCS of LESS THAN 9 normally requires a definitive airway intervention (like endotracheal intubation) or insertion of Guedel airway. Maintain the patient on their side
- A DECLINE OF 2 or more points in the GCS is also reason for consultation or transfer

	RESPONSE	DESCRIPTION	SCORE
EYE OPENING	Spontaneous	The patient's eyes open when you come to the bedside	4
	To voice	The patient's eyes open on command	3
	To pain	The patient's eyes open on suctioning, starting an IV, drawing blood, sternal rubbing, fingernail bed pressure	2
	None	The patient's eyes do not open	1
BEST VERBAL RESPONSE	Oriented	The patient can give name, address and the day of the week	5
	Confused	The patient can give name, but is less likely to know address or day of week. Most patients at this level can name the Prime Minister. Names seem to be retained better than numbers.	4
	Inappropriate words	Inconsistent answers. Patient can give you name only occasionally. Profanity is often retained and frequently the patients repeat the same word over and over.	3
	Incomprehensible sounds	The patient may have deteriorated to the point that intubation has to be done. Intoxicated patients may be at this level.	2
	None	No verbal response	1
BEST MOTOR RESPONSE	Obeys commands	Commands may be complex, as in cranial nerve assessment, eg. 'squeeze my hand'. A positive response from the patient is only meaningful if the second part of the command, 'now let go', is also performed.	6
	Localises pain	The patient is able to localise the source of the pain	5
	Withdraws (pain)	The patient knows there is pain, but cannot localise it	4
	Flexion to (pain)	Sometimes called decortication, though better termed abnormal flexion. The patient flexes his/her arms tightly on his/her chest and extends the lower extremities.	3
	Extension to (pain)	Sometimes called decerebration, this stereotyped response is better termed abnormal extension. The upper extremities extend and internally rotate, the lower extremities extend on stimulation or as the situation worsens, spontaneously.	2
	None	No response. The patient is flaccid. Occasionally as the situation worsens, a weak flexor response develops in the lower extremities. This is a spinal reflex and is a grim prognostic sign.	1
TOTAL SCORE: Maximum = 15 (4+5+6) Minimum = 3 (1+1+1)			

PAEDIATRIC GLASGOW COMA SCALE

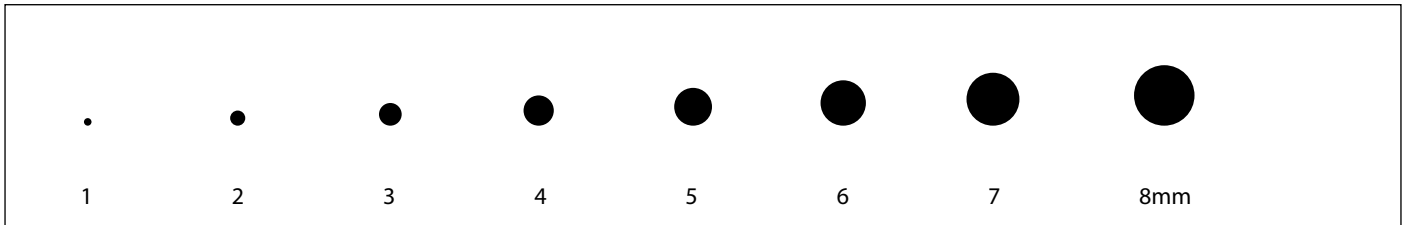
EYE OPENING	LESS THAN 2 YEARS		OVER 2 YEARS		SCORE
	Spontaneously		Spontaneously		4
	To shout		To verbal command		3
	To pain		To pain		2
	No response		No response		1
BEST VERBAL RESPONSE	0-23 MONTHS	2-5 YEARS		OVER 5 YEARS	SCORE
	Smile, coos, cries appropriately	Appropriate words and phrases		Orientated and converses	5
	Cries	Inappropriate words		Disorientated and converses	4
	Inappropriate crying and/or screaming	Cries and/or screams		Inappropriate words	3
	Grunts	Grunts		Incomprehensible sounds	2
	No response	No response		No response	1
BEST MOTOR RESPONSE	LESS THAN 2 YEARS		OVER 2 YEARS		SCORE
			Obeys commands		6
	Localises pain		Localises pain		5
	Flexion withdrawal		Flexion withdrawal		4
	Flexion abnormal (decorticate rigidity)		Flexion abnormal (decorticate rigidity)		3
	Extension (decerebrate rigidity)		Extension (decerebrate rigidity)		2
	No response		No response		1
TOTAL SCORE: Maximum <2 years = 14, >2 years = 15 Minimum = 3 (1+1+1)					

PUPIL ASSESSMENT

Look at the pupils to see if they:

- Are both the same size
- Get smaller when you shine a torch into them
- Both react equally.

Use these black dots each time you assess the pupils so you can consistently note their size.



NEUROVASCULAR ASSESSMENT

Adopted from Neurovascular Assessment, Emergency Department Standard 1.N:3a with permission from Royal Perth Hospital.

PATIENT INTERVIEW	<ul style="list-style-type: none">• Mechanism of injury/history of events• Pain assessment (is the pain increasing?)• Sensation (eg. diminished, burning, pins and needles)• Prior treatment/investigations• Previous orthopaedic/neurovascular history
INSPECTION	<ul style="list-style-type: none">• Compare injured part to uninjured part• Skin colour• Position of extremity (aligned, deformed)• Haemorrhage• Skin deficits (eg. abrasion, laceration, avulsion)• Swelling/ecchymosis (bruising)
PALPATION	<ul style="list-style-type: none">• Skin temperature• Capillary refill (< or > 2secs)• Pulses (present/absent, quality) (eg. Pedal pulses: Dorsalis Pedis, Posterior Tibialis, and Radial and Ulnar pulses)• Movement• Sensation (able to feel touch in all areas)

PAIN ASSESSMENT

Use the following assessment criteria to assess all types of pain.

PROVOKERS/ PALLIATORS	<ul style="list-style-type: none"> • What makes the pain worse or better?
QUALITY	<p>Ask the patient to describe the pain before offering choices.</p> <ul style="list-style-type: none"> • What does the pain feel like? Is it: <ul style="list-style-type: none"> – sharp – dull – burning – stabbing – crushing?
RADIATES	<ul style="list-style-type: none"> • Where does the pain start? • Where does the pain radiate to? • Is it in only one place?
SEVERITY	<ul style="list-style-type: none"> • Ask the patient to rate the severity of the pain on a scale of 0–10, with 10 being the worst possible rating for the pain. (Watch for non-verbal clues with this question. A patient may be writhing in pain and say it is 2 or sitting calmly and tell you it is 10)
TIME	<ul style="list-style-type: none"> • When did it start? • How long did it last? • Is it still there? • Is it there all the time or does it come and go?

PEAK EXPIRATORY FLOW RATE - MALE

Mean predicted normal values of Peak Expiratory Flow Rate (litres/second) in Caucasian men

Height (cm)	145	150	155	160	165	170	175	180	185	190	195
Age 10 (years)	4.9	5.3	5.7	6.1	6.5	6.9	7.3	7.6	8.0	8.4	8.8
12	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.1
14	5.6	6.0	6.4	6.7	7.1	7.5	7.9	8.3	8.7	9.1	9.5
16	5.9	6.3	6.7	7.1	7.5	7.9	8.2	8.6	9.0	9.4	9.8
18	6.2	6.6	7.0	7.4	7.8	8.2	8.6	9.0	9.4	9.7	10.1
20	6.6	7.0	7.4	7.7	8.1	8.5	8.9	9.3	9.7	10.1	10.5
25	6.8	7.2	7.7	8.2	8.6	9.1	9.6	10.1	10.5	11.0	11.5
30	6.6	7.1	7.5	8.0	8.5	8.9	9.4	9.9	10.3	10.8	11.3
40	6.2	6.7	7.2	7.6	8.1	8.6	9.1	9.5	10.0	10.5	10.9
50	5.9	6.4	6.8	7.3	7.8	8.2	8.7	9.2	9.6	10.1	10.6
60	5.5	6.0	6.5	6.9	7.4	7.9	8.4	8.8	9.3	9.8	10.2
70	5.2	5.7	6.1	6.6	7.1	7.5	8.0	8.5	8.9	9.4	9.9
80	4.8	5.3	5.8	6.2	6.7	7.2	7.7	8.1	8.6	9.1	9.5

Pierce, R. and Johns, D. (2004) Spirometry: the measurement and interpretation of ventilatory function in clinical practice. Melbourne National Asthma Council.

PEAK EXPIRATORY FLOW RATE - FEMALE

Mean predicted normal values of Peak Expiratory Flow Rate (litres/second) in Caucasian women

Height (cm)	145	150	155	160	165	170	175	180	185	190	195
Age 10 (years)	4.8	5.0	5.2	5.5	5.7	6.0	6.2	6.5	6.7	7.0	7.2
12	5.1	5.3	5.6	5.8	6.1	6.3	6.5	6.8	7.0	7.3	7.5
14	5.4	5.6	5.9	6.1	6.4	6.6	6.9	7.1	7.3	7.6	7.8
16	5.7	5.9	6.2	6.4	6.7	6.9	7.2	7.4	7.7	7.9	8.2
18	6.0	6.3	6.5	6.8	7.0	7.2	7.5	7.7	8.0	8.2	8.5
20	5.9	6.1	6.4	6.6	6.9	7.1	7.3	7.6	7.8	8.1	8.3
25	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.7	8.0	8.2
30	5.6	5.9	6.1	6.4	6.6	6.8	7.1	7.3	7.6	7.8	8.1
40	5.4	5.6	5.9	6.1	6.4	6.6	6.8	7.1	7.3	7.6	7.8
50	5.1	5.4	5.6	5.9	6.1	6.3	6.6	6.8	7.1	7.3	7.6
60	4.9	5.1	5.4	5.6	5.9	6.1	6.3	6.6	6.8	7.1	7.3
70	4.6	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.6	6.8	7.1
80	4.4	4.6	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.6	6.8

Pierce, R. and Johns, D. (2004) Spirometry: the measurement and interpretation of ventilatory function in clinical practice. Melbourne: National Asthma Council.

Section Three:

Emergency Interventions

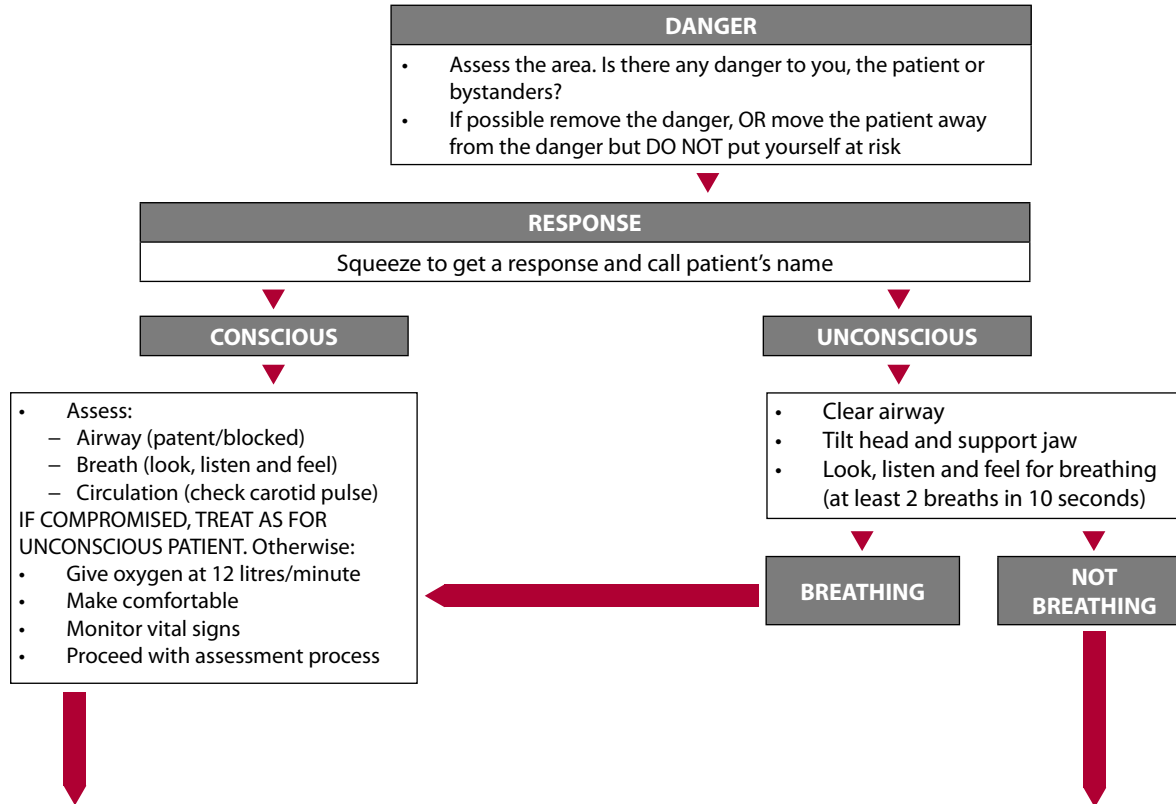
RESUSCITATION INFORMATION CHART

	ADULTS	CHILDREN 1-8 year	INFANTS under 1 year
AIRWAY	Maximum head tilt and jaw thrust (pistol grip)	Head tilt and jaw support (pistol grip)	Neutral head position (perhaps finger jaw support)
BREATHING (Depending on availability: use Oxyviva, mouth-to-mask or mouth-to-mouth)	1 every 4 seconds 15 breaths/minute	1 every 3 seconds 20 breaths/minute	1 every 3 seconds 20 PUFFS/minute
CIRCULATION • HAND POSITION • DEPTH OF COMPRESSION	Find middle of sternum and place 2 hands on the lower half $\frac{1}{3}$ depth of chest Approx. 4-5cms	Find middle of sternum and place heel of hand on lower half $\frac{1}{3}$ depth of chest Approx. 2-3cms	Find middle of sternum and place 2 fingers on the lower half $\frac{1}{3}$ depth of chest Approx. 2cms
ONE OPERATOR	15 compressions: 2 breaths 4 cycles/minute	5 compressions: 1 breath 20 cycles/minute	5 compressions: 1 PUFF 20 cycles/minute
TWO OPERATORS	5 compressions: 1 breath 4 cycles/60 per minute	5 compressions: 1 breath 20 cycles/100 per minute	5 compressions: 1 PUFF 20 cycles/100 per minute



BASIC LIFE SUPPORT

Read with Advanced Life Support and Defibrillation Sections (following pages)



- Position on back on a firm surface
- Place mask firmly over nose and mouth (make sure you have a good seal as per user's manual for Oxyviva OR Laerdal mouth-to-mask device)
- Gently tilt head back and lift jaw to open airway (maintain mask seal)
- Give 5 full inflations within 10 seconds (check that chest rises up and down)
- Use supplemental oxygen if possible
- Check Carotid pulse/Brachial artery in children (present/absent; skin colour)

PULSE PRESENT AND NOT BREATHING

- Continue ventilation at the rate of 1 every 4 seconds (OR rate for Children & Infants **27**)
- Check carotid pulse and breathing after 1 minute and then at least every 2 minutes
- When patient is breathing or if there is a second person
 - establish IV access **206**
 - carry out relevant assessment
 - provide any other urgent intervention

IN CASES OF BLUE RINGED OCTOPUS CONTINUE INDEFINITELY

PULSE ABSENT AND NOT BREATHING

- Commence **ADVANCED LIFE SUPPORT** if able, otherwise: **27**
- Begin CPR
 - Check pulse and breathing after 1 minute, then at least every 2 minutes

PULSE AND SPONTANEOUS RESPIRATION

YES

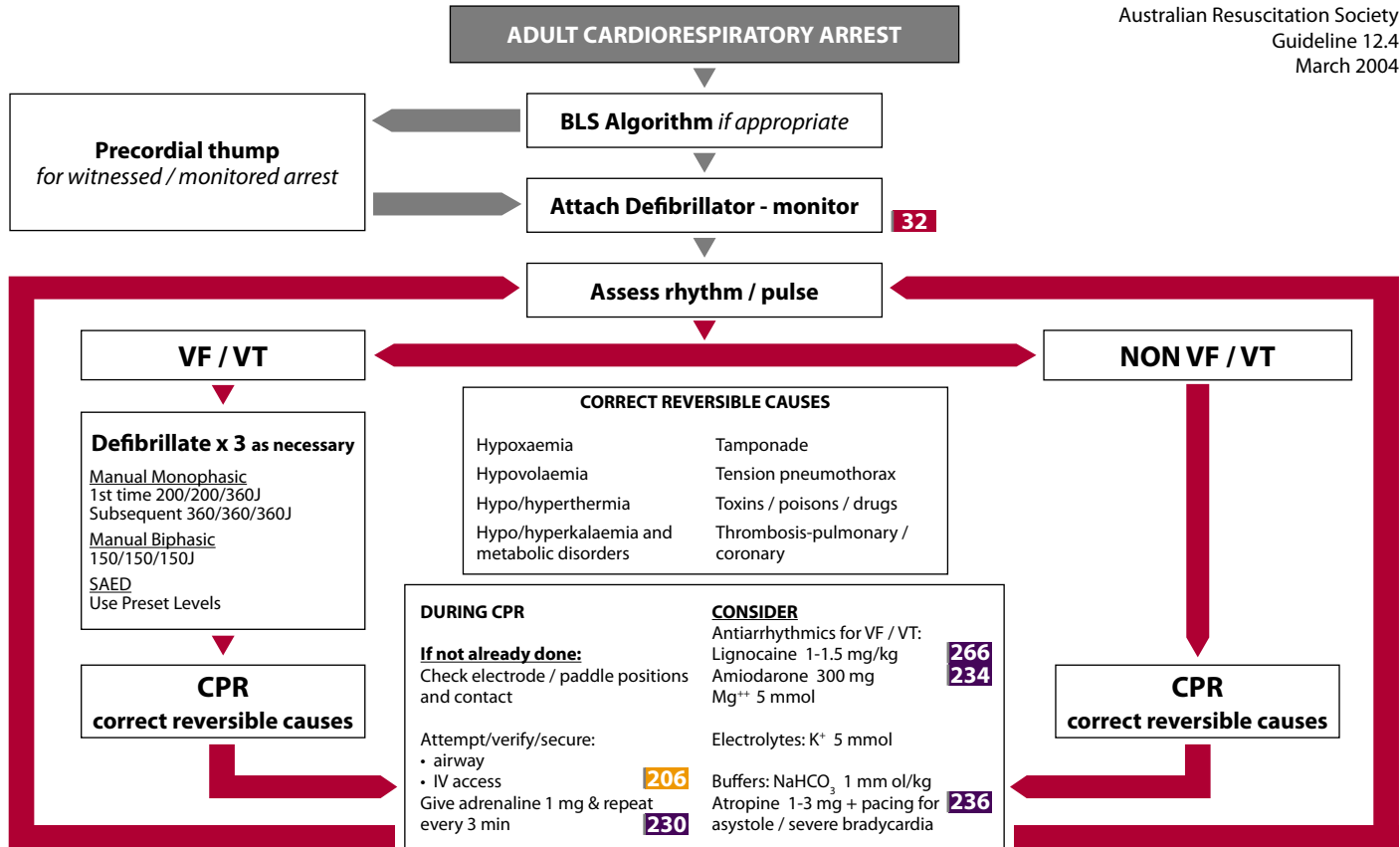
- Oxygen 12 litres/minute via non-rebreathing bag
- Make comfortable
- Monitor vital signs
- Continue assessment process
- Provide any other urgent intervention

NO

- Continue CPR for a minimum of 20 minutes
- If unsuccessful advise doctor
- Consider protracted resuscitation in hypothermic patients

TRANSFER TO HOSPITAL

SEE SUDDEN DEATH 213



PAEDIATRIC CARDIORESPIRATORY ARREST

BLS Algorithm

Provide ventilation and oxygenation

Attach Defibrillator - monitor

Assess rhythm / pulse

VF / VT

Defibrillate x 3 as necessary

Manual Monophasic

1st time 2j/kg, 2-4j/kg, 4j/kg
Subsequent 4j/kg, 4j/kg, 4j/kg

Manual Biphasic

1-2j/kg, 1-2j/kg, 1-2j/kg

SAED

Use Preset Paediatric Levels

CPR

correct reversible causes

NON VF / VT

**GIVE ADRENALINE
10mcg/kg**

CPR

correct reversible causes

CORRECT REVERSIBLE CAUSES

Hypoxaemia	Tamponade
Hypovolaemia	Tension pneumothorax
Hypo/hyperthermia	Toxins / poisons / drugs
Hypo/hyperkalaemia and metabolic disorders	Thrombosis-pulmonary / coronary

DURING CPR

If not already done:

Check electrode / paddle positions and contact

Attempt/verify:

- ETT
- IV access **206**
- Give **adrenaline** 10 mcg/kg & repeat every 3 min **230**

CONSIDER

Antiarrhythmics for VF / VT:

Lignocaine 1-1.5 mg/kg **266**
Amiodarone 5.0 mg/kg **234**
Mg⁺⁺ 0.05 mmol

Electrolytes: K⁺ 0.05 — mmol/kg

Buffers: NaHCO₃ 1 mmol/kg
Atropine 20mcg/kg + pacing **236**
for asystole / severe bradycardia

DEFIBRILLATION OF AN ADULT FOR VENTRICULAR TACHYCARDIA OR VENTRICULAR FIBRILLATION

Adapted from the *Standard for Defibrillation Advanced Life Support* written by the Committee of the Confederation of Australian Critical Care Nurses-WA Branch (Inc.) 1994

It is important that you familiarise yourself with the defibrillator before you need it in a Cardiac Arrest situation. Carrying out a weekly check of the equipment you have available will help.

APPLICATION OF THE DEFIBRILLATOR SHOULD NOT BE DELAYED
IN PREFERENCE TO PERFORMING CPR

SUMMON ASSISTANCE AS SOON AS YOU CAN

PREPARE PATIENT	PREPARE DEFIBRILLATOR
<ul style="list-style-type: none"> • Prepare patient's skin <ul style="list-style-type: none"> – remove fluid/excess sweat – remove obstructing electrical apparatus – remove transcutaneous GTN patches from the chest region • Apply gel pads to skin immediately below the right clavicle adjacent to the right sternal border, and at the 6th intercostal space mid axillary line • If a PERMANENT PACEMAKER is in-situ, position defibrillator paddles a minimum of 5cm from the pacemaker 	<ul style="list-style-type: none"> • Turn on power • Ensure synchronisation function is INACTIVE/OFF (otherwise the defibrillator WILL NOT discharge) • Set defibrillator charge ARC ACS guidelines for biphasic / monophasic defibrillation • Charge defibrillator

TO DEFIBRILLATE

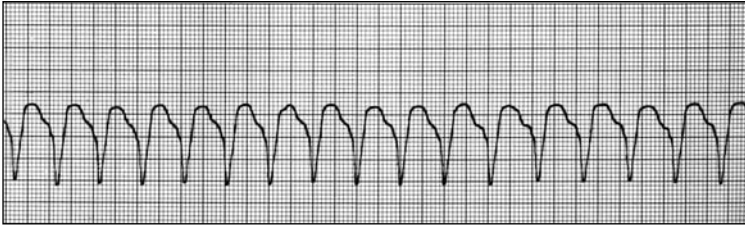
1. Stand on dry surface
2. Apply paddles FIRMLY to chest at the right subclavicular and left apical positions
3. Ensure everyone is clear of patient, bed and attached equipment (including you)
4. Reassess ECG rhythm; DO NOT defibrillate until you have RE-VERIFIED pulseless Ventricular Tachycardia/Fibrillation ON MONITOR & PT.
5. State stand clear. Discharge paddles simultaneously
6. Reassess ECG rhythm
7. (If pulseless VT/VF continues) Recharge defibrillator to appropriate recommended joules
8. State stand clear. Discharge paddles simultaneously
9. Reassess ECG rhythm
10. If defibrillation unsuccessful recharge defibrillator to appropriate recommended joules
11. State stand clear. Discharge paddles simultaneously
12. Reassess ECG rhythm
13. If defibrillation is unsuccessful following three attempts recommence CPR and move to the next step in the Advanced Life Support algorithm

DOCUMENT (complete record of resuscitation as per institutional policy)

- | | |
|---|---|
| <ul style="list-style-type: none">• Time of patient collapse• Patient assessment findings• Time of defibrillation• Joules administered | <ul style="list-style-type: none">• Number of shocks• Patient response to defibrillation• Duration of CPR• Drugs given |
|---|---|

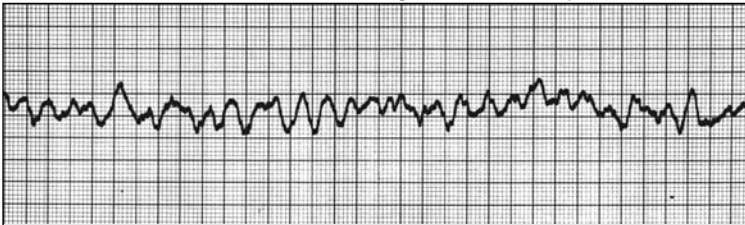
LIFE THREATENING ARRHYTHMIAS

Ventricular Tachycardia (Sutherland Learning Associates, 1972, p228)

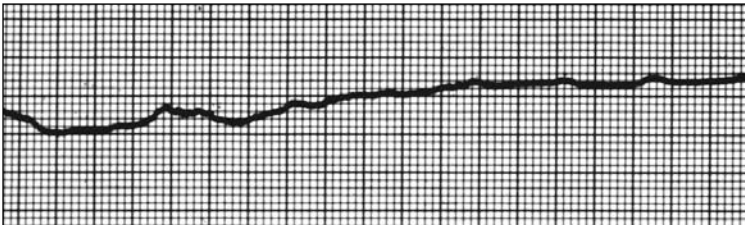


Ensure pulseless prior to defibrillation

Ventricular Fibrillation (Sutherland Learning Associates, 1972, p232)



Asystole (Van Meter and Lavine, 1982, p77)



ABDOMINAL PAIN (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Assess pain 22 • Associated symptoms and relationship of these symptoms to the onset of pain <ul style="list-style-type: none"> – nausea or vomiting, haematemesis – constipation, diarrhoea, melaena – belching or flatulence – urinary frequency, dysuria, observed haematuria – difficulty in passing urine – fever or chills – anorexia or weight loss • Gynaecological history <ul style="list-style-type: none"> – date of last period/normal/abnormal flow – sexually active, contraception used, pain with intercourse – gravity and parity, possibility of pregnancy – vaginal discharge/bleeding • Past medical history <ul style="list-style-type: none"> – prior/concurrent illness, abdominal surgery, alcohol/drug abuse • Current medications (especially those, such as aspirin or anti-inflammatory agents, which may cause gastric side effects) • Last oral intake 	<ul style="list-style-type: none"> • Check for variation in volume and strength of peripheral pulses • Inspect abdomen <ul style="list-style-type: none"> – shape, symmetry – skin discolouration, scars – visible masses, abdominal distension • Auscultation (performed before palpation) <ul style="list-style-type: none"> – presence and frequency or absence of bowel sounds (always listen for a least 2 minutes) – bruits (over the aorta) • Palpation <ul style="list-style-type: none"> – gentle palpation over aorta to exclude pulsatile mass prior to palpation of abdomen – begin a quadrant away from site of pain – direct or referred pain to palpation – abdomen soft/firm – voluntary/involuntary guarding – masses or organomegaly – rebound tenderness – palpable bladder • Note skin colour (pale, jaundiced etc) • Diaphoresis

POTENTIAL PROBLEMS

- | | |
|--|---|
| <ul style="list-style-type: none">• Peritonitis• Bowel obstruction<ul style="list-style-type: none">- intussusception in young child 134• Gastro-enteritis• Urinary tract infection/renal colic pyelonephritis• Ulcer disease• Intestinal obstruction• Appendicitis | <ul style="list-style-type: none">• Food poisoning• Cholecystitis Pancreatitis• Ruptured spleen• Vascular occlusion• Abdominal aortic aneurysm• Ectopic pregnancy• Ovarian cyst/pelvic inflammatory disease |
|--|---|

ABDOMINAL PAIN ASSESSMENT RELATED TO ANATOMICAL REGIONS

RIGHT HYPOCHONDRIAC REGION

- Right lobe of liver
- Gallbladder
- Portion of duodenum
- Hepatic flexure of colon
- Portion of right kidney
- Right suprarenal gland (adrenal)

RIGHT LUMBAR REGION

- Ascending colon
- Lower half of right kidney
- Portion of duodenum and jejunum

RIGHT INGUINAL REGION

- Caecum
- Appendix
- Lower end of ileum
- Right spermatic cord (males)
- Right ovary (female)

EPIGASTRIC REGION

- Pyloric end of stomach
- Duodenum
- Pancreas
- Portion of liver
- Myocardial ischaemia

LEFT HYPOCHONDRIAC REGION

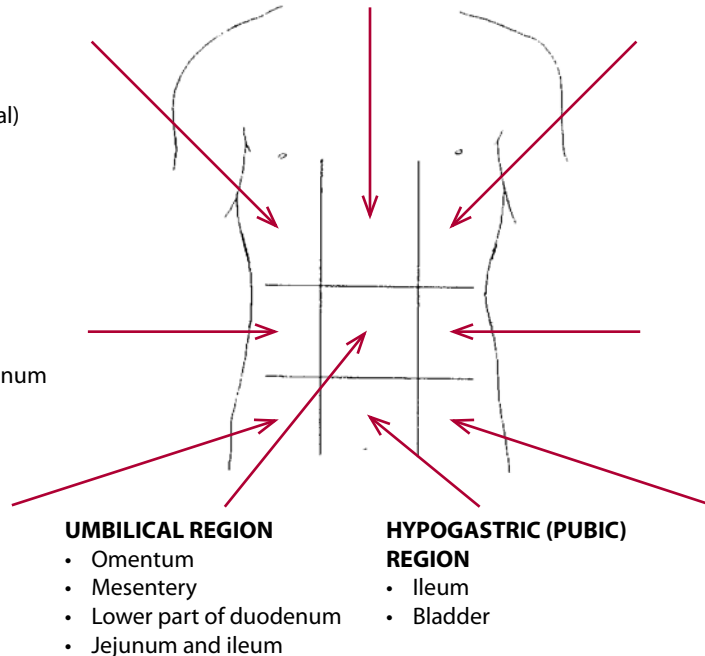
- Stomach
- Spleen
- Tail of pancreas
- Splenic flexure of colon
- Upper pole of left kidney
- Left suprarenal gland
- Myocardial ischaemia

LEFT LUMBAR REGION

- Descending colon
- Lower half of left kidney
- Portions of jejunum and ileum

LEFT INGUINAL REGION

- Sigmoid colon
- Left spermatic cord (male)
- Left ovary (female)



UMBILICAL REGION

- Omentum
- Mesentery
- Lower part of duodenum
- Jejunum and ileum

HYPOGASTRIC (PUBIC) REGION

- Ileum
- Bladder

ABDOMINAL PAIN (INTERVENTION)

URGENT ACTION

- Give oxygen at 12 litres/minute if dyspnoeic or cyanosed
- Assess severity of situation

CRITICAL (tachycardic; hypotensive; febrile; confused; usually more severe pain than those less ill; rigid 'guarded' abdomen)	NON-CRITICAL
<ul style="list-style-type: none"> • Vital signs every 15 minutes • Establish IV access 206 (x 2 if shocked) (See SHOCK for fluid replacement 170) • In addition to abdominal assessment, examine: <ul style="list-style-type: none"> – chest. Do 12 lead ECG – roll patient over and examine back, examine perineum and anal canal • Confirm presence of femoral, peripheral pulses • Test urine. If possible, do Urine HCG on female patients • Analgesia as per ANALGESIA REGIMEN 227 • If evacuating by air and /or excessive vomiting insert nasogastric tube • Nil orally 	<ul style="list-style-type: none"> • Vital signs every 15 minutes • Test urine, if possible • Analgesia as per ANALGESIA REGIMEN 227 • Nil orally
TRANSFER TO HOSPITAL	

URINARY RETENTION

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Low abdominal pain 	<ul style="list-style-type: none"> • Analgesia as per ANALGESIA REGIMEN 227
<ul style="list-style-type: none"> • Inability to pass urine or passing dribbles 	<ul style="list-style-type: none"> • Consider inserting catheter (contact doctor first if possible)
<ul style="list-style-type: none"> • Palpable bladder 	

Contraindications: suspected pelvic fracture, previous stricture, abnormal anatomy etc.

ALCOHOL INTOXICATION (FOCUSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

Anyone who presents as incoherent, disorientated or drowsy should be treated as having a cerebral event until proven otherwise. Consider combinations of substances with alcohol, for example marijuana / amphetamines / cocaine / heroin/ analgesics / benzodiazepines.
 Contact POISONS INFORMATION CENTRE for characteristics and management of drug combinations 13 11 26.

KEY ASSESSMENT POINTS

- | | |
|--|--|
| <ul style="list-style-type: none"> • Level of consciousness 17 • Respiratory status | <ul style="list-style-type: none"> • Gait: normal or ataxic • Check for smell of alcohol |
|--|--|

DOCUMENT 'patient ataxic with slurred speech' or 'odour of alcohol on breath' or 'patient admits to alcohol ingestion', RATHER THAN CLAIMING patient is intoxicated.

SUBJECTIVE ASSESSMENT

- History of present event, ie. reason for presenting
 - these patients require careful assessment
 - may be unrelated to alcohol, eg. chest pain
- History should be obtained from a reliable witness such as a family member
- Past medical history
 - current medications (especially anti-coagulants) and allergies
 - any previous help from alcohol support groups
 - possibility of seizures, trauma, poisoning
- Type and amount of alcohol consumed, if known
- Acute or chronic alcohol intake

OBJECTIVE ASSESSMENT

- Vital signs
 - lying and standing blood pressure if patient gives history of fluid loss such as vomiting/diarrhoea, or if patient is tachycardic
- Respiratory status (may be decreased ↓ with high levels of alcohol)
- Glasgow Coma Scale until head injury disproved **17**
- Note slurred speech
- Appearance:
 - incontinence
 - vomitus on clothes or body
- Nutritional status
- Blood Sugar Level

ALCOHOL INTOXICATION (INTERVENTION)

FOR ALL PATIENTS

- Observe for convulsions or hallucinations which may indicate Delirium Tremens, an acute complication of alcohol withdrawal [refer to alcohol withdrawal chart 41]
- Assess patient's support system and consider possible referral options
- When patient is sober assess interest in detoxification program

UNCONSCIOUS	CONSCIOUS
<ul style="list-style-type: none"> • Protect airway • Position on side to prevent aspiration • Give oxygen at 6 litres/minute • Establish IV access 206 • Protect patient from injury • Vital signs (serial), especially respiration • Glasgow Coma Scale 17 <ul style="list-style-type: none"> – if mental status fails to improve consider other possible causes for altered mental state • Check blood sugar • Orientate patient as arousal occurs • Consider need to transfer to hospital if other pathology (eg. head injury) is suspected 	<ul style="list-style-type: none"> • Be as calm as possible • Avoid confrontation which may stimulate the person who is hypersensitive because of alcohol • Treat as priority to reduce chance of disruptive behaviour • Offer fluids and comfort measures • Patient must be capable of ambulation before being discharged • Discharge to care of responsible adult
<p>Just because a person is intoxicated does not mean that there may not be other injuries, medical problems, etc. Be critical in your observation to avoid underestimation of underlying pathology. An intoxicated person's right to refuse treatment requires careful consideration if there are life or limb threatening injuries.</p>	

ALCOHOL WITHDRAWAL CHART (on following page)

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GENERAL INSTRUCTIONS

These guidelines and the example chart on the following page is for use in the management of the symptoms of alcohol withdrawal. It is based on widely used scoring systems and links scores with suggested doses of diazepam. **243**

The drug of choice is DIAZEPAM 10 TO 20 MG ORALLY OR INTRAVENOUSLY as required. It must be charted on the medication chart. Some areas also use diazepam sublingually. Intravenous doses of diazepam may need to be given when a rapid response is required or gastrointestinal absorption is doubtful. Frequent repeated doses may be required. Diazepam may be withheld when the patient is sedated. However, keep in mind that the patient's condition can change rapidly.

If a drug other than diazepam is used for withdrawal, please write clear dosing instructions in the clinical notes.

THIAMINE 100 MG must be prescribed, preferably orally, but may be given parentally. **299**

Note:

- This guideline does not replace individual clinical judgement
- This guideline does not supersede any existing health service
- Use of this guideline is ultimately at the discretion of the

treating doctor / RFDS

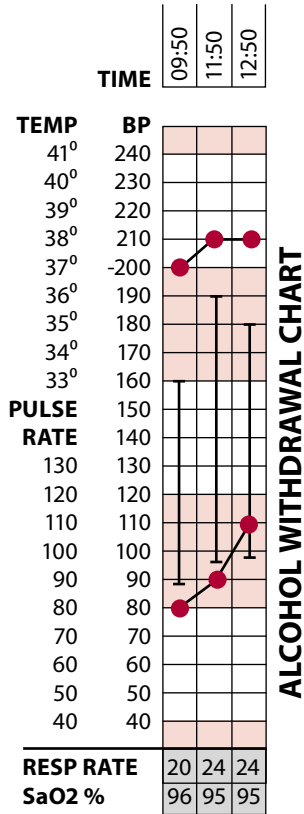
- Discuss plan for transfer of patient at what score
- Prescribing is the responsibility of the treating doctor. They may not choose to use the diazepam dosing regime. However, they may still find the scoring system helpful. Medication must be prescribed

WHEN TO STOP THIS CHART:

This chart can be stopped when the patient has two or more scores of "0" in a row and when staff are no longer clinically concerned about alcohol withdrawal.

Caution: The signs of alcohol withdrawal may mask the signs of other serious medical conditions. Please keep this in mind when reviewing abnormal observations. Policies of activation of any medical emergency protocol still apply.

EXAMPLE CHART



Orientation	0 - Orientated	= The patient is fully orientated in time, place and person
	1 - Disorientated	= Disorientated but cooperative
	2 - Uncooperative	= Disorientated and uncooperative
Agitation / Anxiety	0 - Calm	= Rests Normally
	1 - Anxious	= Appears anxious
	2 - Panicky	= Appears very agitated all the time, panics or gets out of bed for no reason
Hallucinatⁿ	0 - None	= No evidence of hallucinations
	1 - Can dissuade	= Distortions of real objects or hallucinations* but accepted as not real when pointed out
	2 - Can't dissuade	= Believes the hallucinations* are real and cannot be reassured
Perspiratⁿ	0 - Nil	= No abnormal sweating
	1 - Moist/Wet	= Mild to moderate perspiration
	2 - Soaking	= Soaking sweat
Tremor	0 - No tremor	= No tremor
	1 - With intentional	= Tremor when moving hands and arms
	2 - Tremor at rest	= Constant tremor of arms even at rest
Temp	0 - 37.5° or less	= 37.5° or less
	1 - 37.6° to 38.5°	= 37.6° to 38.5°
	2 - > 38.5°	= Temperature above 38.5°

* Hallucination = Appearance of totally new objects or perceptions not related to any real object

ACTION	SCORE 0	Observations 4 hourly (No diazepam required)
	1 - 3	Observations 2 hourly. Give diazepam 10 mg first dose or 5 to 10 mg maintenance
	4 - 6	Observations 1 hourly (minimum of two hours). Give diazepam 20 mg first dose or 10 mg maintenance
	7 - 9	Observations 1 hourly (minimum of four hours). Give diazepam 20 mg each dose
	10 - 12	diazepam 20 mg

ANAPHYLAXIS (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- Respiratory symptoms
- Presence of facial and neck oedema
- Skin colour

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Presenting symptoms <ul style="list-style-type: none"> – dyspnoea, tightness in chest – dysphagia – itching – swollen lips, tongue or fingers – feelings of weakness, dizziness, syncope – anxiety, feeling of suffocation – paraesthesia • Associated history <ul style="list-style-type: none"> – time of onset of symptoms – sensitising agent if known – allergies: history of similar reactions – underlying respiratory problems 	<ul style="list-style-type: none"> • Vital signs, particular attention to respiratory status <ul style="list-style-type: none"> – respiratory status: observe for coughing, wheezing, or stridor; change or loss of voice or swelling of mucous membranes; shortness of breath – conscious state: restlessness or agitation; patient may complain of headache 17 – cardiovascular status: note hypotension which may indicate anaphylactic shock • Skin condition: <ul style="list-style-type: none"> – sweating – flushing – rash, urticaria – oedema – warmth

ANAPHYLAXIS (INTERVENTION)

Adapted with permission Dr S Brown
Emergency Physician, Emergency Department Fremantle Hospital

CONFIRM DIAGNOSIS and CONSIDER PREVIOUS HISTORY

MILD ANAPHYLAXIS	MODERATE ANAPHYLAXIS	SEVERE ANAPHYLAXIS
<ul style="list-style-type: none"> • Restlessness • Cough • Light-headedness • Anxiety • Sense of warmth • Itchiness or rash, especially throat 	<ul style="list-style-type: none"> • Blotchy red rash • Oedema of face, neck and soft tissue • Retrosternal pain • Dysproea • Vomiting • Diaphoesis • Chest or throat tightness • Abdominal pain 	<ul style="list-style-type: none"> • Laryngeal oedema • Wheezing, stridor, dyspnoea • Circulatory shock (hypotension, rapid, thready pulse) • Collapse
<ul style="list-style-type: none"> • Identify and stop administration of causal agent • Give Oxygen at 6-8 litres/minute • Vital signs every 15 minutes • Establish IV access 206 • Administer Promethazine 1mg/kg 290 (to maximum of 50mg) IM • Reassure patient • Observe patient, as progression to anaphylactic shock may be rapid 	<ul style="list-style-type: none"> • Initiate CPR as indicated (instigate cardiac monitoring if available) • Give Oxygen at 12 litres/minute • Establish IV access 206 • Vital signs every 15 minutes • Administer <ul style="list-style-type: none"> - Adrenaline 0.01 mg/kg (to maximum of 0.5 mg) 1M to anterior thigh repeat every 5- 10 minutes until symptomatic response 230 - Hydrocortisone 100 mg IV (or IM if no intravenous access) 259 • If hypotensive (ie. BP less than 85 mmHg systolic) <ul style="list-style-type: none"> - give bolus of Normal Saline 500 mL IV, may repeat x 1 - Lie patient flat, elevate legs 	
TRANSFER TO HOSPITAL		TRANSFER TO HOSPITAL

USE OF ADRENALINE (A QUICK REFERENCE) 230

	ADRENALINE 1:1,000	ADRENALINE 1: 10,000
	The dosage of Adrenaline 1:1,000 solution given INTRAMUSCULARLY is as follows:	The dosage of Adrenaline 1: 10,000 solution (in pre-filled syringes) given INTRAMUSCULARLY is as follows:
AGE	DOSE	DOSE
Below 1 year	0.05 mL	0.5 mL
1 year	0.10 mL	1.0 mL
2 years	0.20 mL	2.0 mL
3 - 8 years	0.30 mL	3.0 mL
8 years and above	0.50 mL (Adult dose)	5.0 mL (Adult dose)

RULES FOR ADMINISTRATION

- Give as intramuscular injection or IV in an emergency 0.1 mg/kg to maximum of 0.5 mg repeated 1 - 2 minutes
- Always use pre-filled or Tuberculin syringe
- Remember to draw back to ensure needle is not in blood vessel
- Always administer as quickly as possible
- Always check pulse rate
- Do not give SC or IM into arm (unreliable absorption from these sites)

ARTERIAL OCCLUSION (ACUTE) FOCUSED ASSESSMENT AND INTERVENTION

Adapted from Primary Clinical Care Manual. (2003).
With permission from the North Queensland Rural Health Training Unit

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

Acute arterial occlusion is an EMERGENCY requiring URGENT SURGERY

KEY ASSESSMENT POINTS

- Obtain a full history including past episodes or heart disease
- Neurovascular observations on affected limb **21**

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • A painful limb, of acute onset • Limb is tender, cold, pale pulseless <p>NOTE: Usually elderly patient in Atrial Fibrillation</p>	<ul style="list-style-type: none"> • Place limbs in a dependent position (ie. Hanging down to promote collateral blood flow) • Consult doctor urgently • Analgesia as per ANALGESIA REGIMEN 227 • Nil by mouth
TRANSFER TO HOSPITAL	

BITES & STINGS (SEA CREATURES)

Contact Poisons information 13 11 26 (24 hours) and talk to clinical toxicologist for further information

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life support if required. **28** Follow Medical Consultation flowchart. **4**

References: University of Melbourne Venom Research Unit @ <http://www.avru.unimelb.edu.au> , page accessed Nov 1, 2004. ARC guidelines accessed Nov 1, 2004 @ <http://www.resus.org.au/> "Marine envenomation" accessed Nov 2, 2004 @ http://www.usyd.edu.au/anaes/venom/marine_enven.html

BOX JELLYFISH

SIGNS & SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Whip-like sting marks evident • Immediate severe pain • Venom acts quickly and can move rapidly to cause: <ul style="list-style-type: none"> - Loss of consciousness - Cardiorespiratory arrest 	<ul style="list-style-type: none"> • DR ABC • DO NOT RUB SITE WITH SAND OR A TOWEL • Irrigate with vinegar (acetic acid) or water (as hot as YOU can comfortably tolerate, or immerse both of the patient's limbs so if it is too hot the good limb will feel it) <ul style="list-style-type: none"> – preferably hot water T - >43°C for 20 minutes • Vital signs (serial) • Monitor conscious state • Remove adherent tentacles with tweezers • Apply ice packs wrapped to site • Insert IV cannula and administer O₂ @ 12/ min as required via non-rebreather mask • Analgesia as per ANALGESIA REGIMEN 227 unless contraindicated (eg. in hypotension or respiratory distress)
URGENT TRANSFER TO HOSPITAL FOR ANTIVENOM	

IRUKANDJI STINGS (IRUKANDJI SYNDROME)

Signs and symptoms can develop 30 minutes after being stung by this jelly fish.

SIGNS & SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Severe back / abdominal / joint / limb pain • Nausea & vomiting • Profuse sweating • Agitation • Numbness • Parasthesia • Supraventricular tachycardia • Hypertension/ hypertensive crisis 	<ul style="list-style-type: none"> • DR ABC • monitor vital signs (ECG monitoring if available; perform 12 lead ECG) • Insert IV cannula • Analgesia per ANALGESIA REGIMEN 227 (may require intravenous analgesia) • No antivenom available • Urgent transfer to hospital

OTHER JELLYFISH

References: University of Melbourne Venom Research Unit @ <http://www.avru.unimelb.edu.au> , page accessed Nov 1, 2004
 "Marine envenomation" accessed Nov 2, 2004 @ http://www.usyd.edu.au/anaes/venom/marine_enven.html

SIGNS & SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Wheals of varying size and shape on a red base • Localised pain • Occasional symptomatic or allergic reaction 	<ul style="list-style-type: none"> • Irrigate site with WATER (as hot as YOU can comfortably tolerate, or immerse both of the patient's limbs so if it is too hot the good limb will feel it) – preferably hot water T - >43°C for 20 minutes • Apply ice pack • Oral analgesia as required per ANALGESIA REGIMEN 227 • +/- administration of antihistamine for allergic skin reactions per 290 • Consult doctor as required

FISH STINGS (STONEFISH, STINGRAY)

Adapted from Primary Clinical Care Manual. (2003).

With permission from the North Queensland Rural Health Training Unit

References: University of Melbourne Venom Research Unit @ <http://www.avru.unimelb.edu.au>, page accessed Nov 1 2004
 "Marine envenomation" accessed Nov 2, 2004 @ http://www.usyd.edu.au/anaes/venom/marine_venen.html

SIGNS & SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Immediate intense pain • Stingray barb may cause penetrating/ bleeding wound (which may necrose) • Swelling and blue or grey discolouration of sting site • Stonefish sting may cause muscle weakness, paralysis ,respiratory difficulty and hypotension/shock 	<p style="text-align: center;">DO NOT APPLY COMPRESSION BANDAGE</p> <ul style="list-style-type: none"> • Immerse in hot water (as hot as YOU can comfortably tolerate, or immerse both of the patient's limbs so if it is too hot the good limb will feel it) – preferably hot water T - >43°C for 20 minutes • Analgesia as per ANALGESIA REGIMEN 227 - IV Narcotic analgesia may be required • Irrigate and dress stingray wound. May require infiltration with local anaesthetic Xylocaine 1% (plain) to assist with pain relief. (Remove the sting barb if possible) • In stonefish sting monitor ABC and check vital signs. Patient may require stonefish antivenom if systemic signs of envenomation, eg. respiratory compromise, severe pain, multiple puncture sites • Check Tetanus immunisation status • Consult doctor
<p>TRANSFER TO HOSPITAL IF SIGNS OF ENVENOMATION from stonefish TRANSFER TO HOSPITAL IF WOUNDS TO CHEST OR ABDOMEN FROM STINGRAY (Also, large penetrating wounds from stingray to peripheries may require surgical debridement in theatre.)</p>	

BLUE RINGED OCTOPUS AND CONE SHELL ENVENOMATION

Reference: University of Melbourne Venom Research Unit @ <http://www.avru.unimelb.edu.au>,
page accessed Nov 1 2004 "Marine envenomation" accessed Nov 2, 2004 @ http://www.usyd.edu.au/anaes/venom/marine_enven.html

SIGNS & SYMPTOMS	
BLUE RINGED OCTOPUS	CONE SHELL
<ul style="list-style-type: none"> • Frequently a painless wound • Onset often within a few minutes • Numbness of lips and tongue may occur initially • Can rapidly progress to muscle weakness, disturbance of speech and vision. Progresses to motor paralysis, eg. swallowing/breathing difficulties and respiratory arrest 	<ul style="list-style-type: none"> • Local pain, swelling and numbness • Can progress to muscle incoordination and weakness, disturbance of speech, vision and even hearing • If severe envenomation progression to motor paralysis eg. swallowing/breathing difficulties and respiratory paralysis

INTERVENTION
<ul style="list-style-type: none"> • There is no antivenom available for blue ringed octopus or cone shell envenomation; therefore, management is supportive • Even if respiratory or cardiac arrest occurs CONTINUE Expired Air Resuscitation +/- External Cardiac Compression INDEFINITELY because the body's heat can inactivate the venom but it takes several hours to do so • Apply a pressure bandage over the wound site and involved limb • Apply a splint to immobilise limb • Keep patient still • Check Tetanus vaccination status • Consult doctor
<p>Do not remove bandages unless doctor advises (should be left in-situ until body heat has had time to deactivate some of the venom and the victim has been evacuated to an appropriate facility)</p> <p>URGENT TRANSFER TO HOSPITAL</p>

BITES & STINGS (TERRESTRIAL)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

CENTIPEDE BITE

SIGNS AND SYMPTOMS	INTERVENTION
May cause: <ul style="list-style-type: none">• Burning pain• Local swelling & erythema• Lymphangitis• Lymphadenopathy	<ul style="list-style-type: none">• Wash, rest, elevate and cool• May infiltrate around bite with local anaesthetic (Lignocaine 1%) 268• Ensure Tetanus prophylaxis
FOR SEVERE REACTIONS ANTIHISTAMINES AND STEROIDS MAY BE REQUIRED. (CONSULT DOCTOR)	

SCORPION STING

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none">• May cause considerable pain	<ul style="list-style-type: none">• Ice pack to site• Ensure Tetanus Prophylaxis• Consult doctor

REDBACK SPIDER BITE

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Immediate pain • Tachycardia • Sweating- localised and general • Nausea, vomiting • Abdominal pain • Headache <p>Untreated, symptoms may increase in severity over several hours</p>	<p>DO NOT APPLY COMPRESSION BANDAGE (as restricting venom movement increases pain)</p> <ul style="list-style-type: none"> • Wash, rest, elevate & cool site • Reassure patient • Check vital signs every 15 minutes • Apply ice packs wrapped to site for 20 minutes • Analgesia as per ANALGESIA REGIMEN 227 • Observe for signs of increasing envenomation or allergic reaction • Confirm identity of spider if possible • Consult doctor
<p>MAY BE LIFE THREATENING TO A CHILD TRANSFER TO HOSPITAL FOR ANTIVENOM</p>	

NOTE

BEE STINGS and SCORPION STINGS are NOT life threatening unless the person has sensitivity to them, allergic reaction or there are multiple stings

SNAKE BITE (LAND AND SEA)

Contact Poisons information centre 13 11 26 (24 hours)

ALL PEOPLE WITH SNAKE BITE OR SUSPECTED SNAKE BITES SHOULD BE ADMITTED AND OBSERVED IN HOSPITAL

In all cases of large envenomation the patient will be critical in minutes rather than hours

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**

Carry out Basic Life support if required. **28** Follow Medical Consultation flowchart. **4**

REMEMBER: LEVEL OF CONSCIOUSNESS MAY BE ALTERED AND USUAL CAUSE OF DEATH IS RESPIRATORY FAILURE

DO NOT WASH THE AREA OF THE BITE AND APPLY PRESSURE IMMOBILISATION IMMEDIATELY
(RFDS/hospital will need a sample of venom to establish snake type before giving antivenom)

FOCUSSED ASSESSMENT

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none">Ascertain from patient or others with him/her details about:<ul style="list-style-type: none">What the patient was doing at the time of the bite?Did the patient see the snake?Does he/she feel any different, eg.: may have been watering the garden and felt a scratch on leg. May have "felt well but had a restless night, then felt really unwell by morning"	<ul style="list-style-type: none">Check vital signsCheck urinalysis (note haematuria)Glasgow Coma Scale 17Check for signs of bleeding, eg. gums/nose bleedsMeasure circumference of affected limb approximately 12 cm above bite site so that swelling can be assessedNeurology, eg. ptosis/confusionNote any paralysis of limbsNote any nausea, vomiting or abdominal painConsult doctor

REMEMBER: SNAKEBITES ARE NOT NECESSARILY PAINFUL, WHEREAS SPIDER BITES USUALLY ARE.

PRESSURE-IMMOBILISATION FIRST AID FOR VENOMOUS BITES AND STINGS

PRESSURE-IMMOBILISATION IS RECOMMENDED FOR:	DO NOT USE PRESSURE-IMMOBILISATION FIRST AID FOR:
All Australian venomous snake bites, including sea snake bites	Redback Spider bites
Funnel web spider bites	Other spider bites, including mouse spiders, white tailed spiders
Box jellyfish stings (if possible)	Bluebottle jellyfish stings
Bee, wasp and ant stings in allergic individuals	Other jellyfish stings
Blue ringed octopus bites	Stonefish and other fish stings
Cone snail (cone shell) stings	Bee and wasp stings in non-allergic individuals
Australian paralysis tick envenomation	Bites or stings by scorpions, centipedes, beetles

Research stresses the importance of keeping the patient still.
This includes all the limbs. Bring transport to the patient if possible.

Bites to the lower limb	<p>Apply a broad pressure bandage over the bite site as soon as possible Crepe bandages are ideal, but any flexible material may be used Clothing, towels etc may be torn into strips. Pantyhose have been successfully used</p> <p>Do not take off clothing, as the movement of doing so will promote the movement of venom into the bloodstream. Keep the bitten limb, and the patient, still</p> <p>Bandage upwards from the lower portion of the bitten limb. Even though a little venom may be squeezed upwards, the bandage will be more comfortable, and therefore can be left in place for longer if required</p> <p>The bandage should be as tight as you would apply to a sprained ankle</p> <p>Extend the bandage as high as possible up the limb</p> <p>Apply a splint to the leg. Any rigid object may be used as a splint, eg. spade, piece of wood or tree branch, rolled up newspapers etc</p> <p>Bind it firmly to as much of the leg as possible</p> <p>Keep the patient still. Lie the patient down to prevent walking or moving around</p>
Bites to the hand or forearm	<p>Bandage as much of the arm as possible, starting at the fingers</p> <p>Use a splint to the elbow</p> <p>Use a sling to immobilise the arm</p> <p>Keep the patient still. Lie the patient down to prevent walking or moving around</p>
Bites to the trunk	<p>If possible apply firm pressure over the bitten area. Do not restrict chest movement. Keep the patient still</p>
Bites to the head or neck	<p>No first aid for bitten area. Keep the patient still</p>

SIGNS & SYMPTOMS OF ENVENOMATION

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<p>Local:</p> <ul style="list-style-type: none"> • Puncture marks, oedema at the site (puncture marks are not always visible) • Site may NOT be painful • Petechiae (small pink spots that do not blanch) • Bruising • No signs at all <p>Most WA snakes cause an asymptomatic coagulopathy, but the patient feels OK. You don't know how sick they are unless you test their blood.</p> <p>One test to check for a coagulopathy that can be done in the clinic is to take 10 mLs of blood from the patient, place in a jar or plain blood tube and leave for 20 minutes (do not shake or touch the tube). If the blood is still liquid after this time it is indicative of envenomation and a significant coagulopathy.</p>	<p>Systemic:</p> <p>Less than 1 hour after bite</p> <ul style="list-style-type: none"> • vomiting • headache & sweating • transient hypotension, confusion or unconsciousness <p>1-3 hours after bite</p> <ul style="list-style-type: none"> • ptosis, double vision • voice changes • difficulty in swallowing • abdominal pain • increasing confusion • dark urine (due to haemoglobinuria) • haemorrhage • hypertension • tachycardia <p>Over 3 hours:</p> <ul style="list-style-type: none"> • paralysis of limbs • loss of respiratory muscle function • hypoxia • cyanosis • shock • dark urine • myolysis (muscle weakness, pain on movement and dark urine)

SNAKE BITE (INTERVENTION)

IN ALL CASES
DO NOT WASH, CUT OUT, OR APPLY A TOURNIQUET TO BITE AREA.
<ul style="list-style-type: none"> • Keep patient CALM and as STILL as possible • Delay venom movement by applying effective pressure immobilisation bandage (PIB) (54 for application and indications of PIB. DO NOT release it until patient reaches full medical facility.) • Mark puncture site on the outside PIB • Observe for signs of compromised circulation from the lymphatic bandage • Splint limb 211 • If analgesia is required use Paracetamol or Paracetamol/ Codeine, NO NARCOTICS • Take careful history 53 • Observe for signs of envenomation 56 • Test urine (LOOK FOR BLOOD) 56 • Check Tetanus immunisation status
CONSULT DOCTOR AND EVACUATE

ARE SIGNS OF ENVENOMATION PRESENT?	
Yes	No
<ul style="list-style-type: none"> • Vital signs every 15 minutes • Glasgow Coma Scale 17 • Insert IV 206 • If BP ↓ 85mmHg systolic give bolus of 500 mL of colloid eg. Gelofusine® 249 (may repeat x 1) • Follow with Crystalloid solution eg. Hartmann's/ Normal saline solution 240 	<ul style="list-style-type: none"> • Observe • Vital signs hourly, wake client if necessary • Glasgow Coma Scale 17 • IV access 206 • Reassure patient and significant others
URGENT EVACUATION	EVACUATE

ANYONE WITH A SUSPECTED SNAKE BITE MUST BE EVACUATED TO HOSPITAL FOR OBSERVATION FOR AT LEAST 24 HOURS
(and for removal of compression bandages)

Antivenom is available at hospitals and RFDS. RFDS will bring and administer Antivenom on site if indicated.

BURNS (INITIAL MANAGEMENT OF ADULTS PRIOR TO TRANSFER TO THE BURNS UNIT)

Adapted from: *Assessment and treatment form for adult burn victims*. Compiled by Lynn Barnden (CN), authorised by Fiona Wood FRACS Director of Burns Unit Royal Perth Hospital Revised November 2004, with permission from Royal Perth Hospital.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

FIRST AID

- Stop the burning process. 'Cool the Burn' with cool running water for 20 minutes. **NO ICE**
- Remove jewellery such as rings, necklaces, chains, earrings, and watch
- Remove clothing gently if it is NOT stuck to the skin
- Chemical Burns - Contact Burns Unit for further advice

FOCUSSED ASSESSMENT

AIRWAY

- Check airway patency
- If there are burns to the face, neck or upper torso; if burn took place in a confined space; or if there was an explosion, there may be damage to the respiratory tract due to inhalation of heat, gases or smoke
- Associated inhalation injury look for:
 - singed nasal hair
 - soot particles in mouth and nose
 - dry, red, oral nasal mucosa hoarseness, wheezing
 - circumferential neck burns
 - oro-pharyngeal burns
- For suspected inhalational injuries consult with doctor for consideration of bronchodilators

Continued over the page...

FOCUSSED ASSESSMENT cont...

BREATHING	<ul style="list-style-type: none"> • If patient has respiratory distress, intubation is used in preference to tracheostomy <ul style="list-style-type: none"> – ie. Tracheostomy is avoided where possible • Arterial Blood Gases should be checked where possible • Humidified oxygen should be commenced • Nurse patient in sitting position <ul style="list-style-type: none"> - unless contraindicated, eg. spinal injury
CIRCULATION	<ul style="list-style-type: none"> • Check for pulses (adequate supply to limbs?) 21 • Areas of circumferential full thickness burns will cause constriction to circulation and must be noted (escharotomies may be required) • Respiratory function • Elevate affected area
CONCURRENT INJURIES	<ul style="list-style-type: none"> • Check for any other injuries (ie. cervical injuries or other spinal or bone injuries, lacerations, loss of consciousness, suggesting skull fracture, etc.)
BRIEF BURN HISTORY Information may be gathered from the victim, the victim's relatives, ambulance crew or rescuers.	<ul style="list-style-type: none"> • Obtain information on how, when, and where the injury occurred <ul style="list-style-type: none"> – duration of exposure to burning agent – time of the burn – date of the burn – did the burn occur in a confined space? – was there an explosion?
BRIEF HISTORY	<ul style="list-style-type: none"> • Allergies, past medical history, tetanus status, medications • Age of the patient (a burn injury is more devastating or life threatening in the very young or the elderly) • Pre-existing disease (ie. Diabetes, alcoholism, renal disease, auto immune disease, and psychosis) • Current medications
OEDEMA	<ul style="list-style-type: none"> • Elevate the burn area. If the face, neck or airway is burnt sit the patient upright and elevate burnt limbs.
<p>CONTACT Royal Perth Hospital 08 9224 2244 and page Registrar on call for burns, OR Contact the BURNS UNIT (RPH) 08 9224 2153 and ask for Nurse Coordinator</p>	

SECONDARY ASSESSMENT

- Do a head-to-toe assessment and check for any other injuries
- Calculate percentage of burn (see section on Calculating % of Burns **63**)
- Determine depth of burns (see section below)
- Determine cause of the burn (ie. flame, scald, electrical, chemical, friction, radiation, freeze)
- Estimate duration of the burning process (the extent of the burn is directly proportional to the duration of exposure to the burning agent)
- Pinpoint time of the burn (the 24 hours burn resuscitation period is commenced from the time of the burn, not from the time of medical assistance (eg. if the patient takes 4 hours to reach medical assistance then 4 hours of fluid loss must be replaced)
- Did the burn occur in a confined space? Or was there an explosion?
 - if so there is more risk of inhalation of heat, smoke, or poisonous gases

DEPTH OF BURNS

DEPTH	COLOUR	BLISTERS	CAPILLARY REFILL	SENSATION	HEALING
Epidermal erythema	Red	No	Present	Present	Yes
Superficial Dermal	Red / Glistens	Small	Present	Painful	Yes
Mid Dermal partial thickness	mottled /red pale	Present	Sluggish	Painful	Usual
Deep Dermal Deep partial thickness	Blotchy cherry/red	Present	Absent	Absent	No
Full Thickness	White black or brown	May be present/ often burnt off	Absent	Absent	No

BURNS INTERVENTION

Adapted from: *Assessment and treatment form for adult burn victims*. Compiled by Lynn Barnden (CN), authorised by Fiona Wood FRACS Director of Burns Unit Royal Perth Hospital Revised November 2004, with permission from Royal Perth Hospital.

For advice phone ROYAL PERTH HOSPITAL 08 9224 2244 and Page Registrar on call for burns, OR
Contact the BURNS UNIT 08 9224 2153 and ask for Nurse Coordinator

- Vital signs
 - respirations - observe quality and character
 - pulse (usually tachycardia)
 - temperature
 - blood pressure
 - hypertension: stress response
 - hypotension: fluid shift and losses
- Glasgow Coma Scale **17**
- Stop the burning process as described under First Aid **58**
 - then use cool saline soaks - use plenty of saline NO ICE /Cool running water for 20 minutes
- Chemical burns
 - if liquid chemical, irrigate with water
 - if powder, DUST OFF the skin as water may activate the chemical and exacerbate the burn
- Tar burns
 - cool tar with water and leave in place
- Establish IV access with 2 x large bore cannula, if possible **206**

(NO MEDICATIONS SHOULD BE GIVEN ORALLY, SUBCUTANEOUSLY, OR INTRA MUSCULARLY, AS VICTIM IS IN SHOCK)

- Analgesics should be given as initial, small IV push doses of narcotic (usually Morphine) then continued as small frequent doses. A morphine infusion should be commenced as soon as possible (see Pain Relief **62**)
- Commence fluid resuscitation (see Fluid Replacement/Resuscitation **64**)
- Administer oxygen at 12 litres/minute
- Insert indwelling catheter for adults and monitor hourly urine output
 - regulate IV fluids to maintain the urine output at 0.5-1 mL per kilo body weight/hour with a specific gravity 1020

- Insert nasogastric tube
 - Escharotomies if necessary (**ALWAYS contact BURNS Registrar or Consultant prior to proceeding**)
 - Tetanus toxoid should be given if patient is not currently covered
 - Reduce oedema
 - elevate the burn area (if the face, neck or airway is burnt sit the patient upright and elevate burnt limbs)
 - Urinalysis
 - Treat burn wound
 - wash off loose material and devitalise hanging skin
 - de-roof any blisters
 - if close to the Burns Unit, wrap the patient in a clean sheet and transfer to the Burns Unit
 - if some hours from the Burns Unit, cover the wound surface with Silversulphadiazine Cream (SSD). Gauze or a sheet maybe used to keep the SSD in contact with the burn surface
- DO NOT use any other ointments or creams as this may make it difficult to assess the wound once the victim arrives in the Burns Unit.

TRANSFER TO HOSPITAL

PAIN RELIEF**REMEMBER: Always use IV injections for patient with large burns and circulatory compromise**

- Administer Morphine Sulphate 10 mg/ mL diluted with 9 mL 0.9% Sodium Chloride (10 mL) (Inject IV only) **276 296**
 - an initial dose of 5 mg (5 mL) should be used unless age, size or contributing factors suggest that 2.5 mg (2.5 mL) should be the initial dose
 - then 2.5 mg (2.5 mL) increments every 5 minutes until pain is controlled or to a maximum dose of 20 mg (20 mL)
 - Following Morphine Sulphate administer Metoclopramide 5 mg per minute to a maximum dose of 10 mg **276 270**
- Note: Metoclopramide IS NOT APPROVED FOR PAEDIATRIC USE (under 12 years). If an antiemetic is required for a child, use IM Promethazine 0.5 mg/kg (to maximum of 25 mg) **290**

CALCULATING % OF BURN

- Work out the percentage of burn using the charts in Figures 1 and 2 below
- Include all burnt areas in your calculation

Figure 1

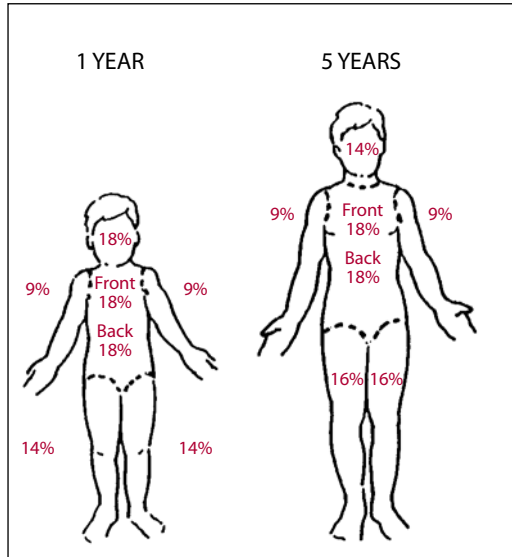
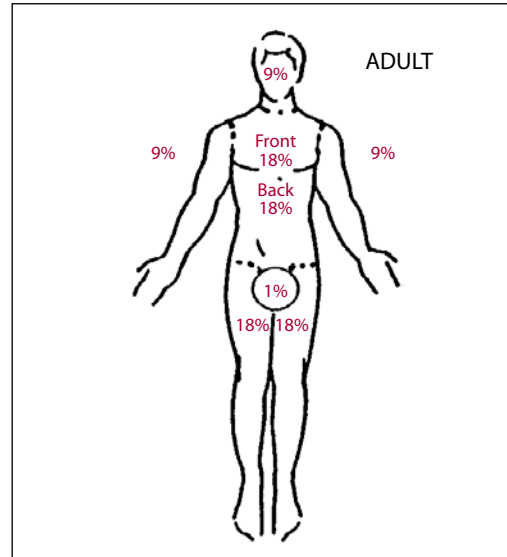


Figure 2



NOTE: The palmar surface (including the fingers) of the PATIENT'S hand is about 1% of their body surface. Use this as a quick measure.

FLUID REPLACEMENT/RESUSCITATION

Those requiring fluids are kids with 10%+ burns, adults with 15%+ burns and patients who cannot maintain oral intake

Fluid losses are large and initially insidious in full or partial thickness burns

- CONSULT doctor as priority
- Commence IV infusion (use Hartmann's solution or Normal Saline) **240 296**
- Resuscitation fluid is worked out according to the victim's body weight and the percentage of burn. So you will need to:
 1. Establish patient's weight
 2. Calculate % of burn (See Figures 1 and 2 **63**)
- The FORMULA for fluid resuscitation/replacement used at Royal Perth Hospital is:
 $2 \times \text{PERCENTAGE OF BURN} \times \text{BODY WEIGHT} = \text{QUANTITY OF FLUID TO BE REPLACED}$
 1. First 8 hours give 50% of quantity
 2. Second 8 hours give 25% of quantity
 3. Third 8 hours give 25% of quantity
 - * The normal daily fluid requirement must also be given (ie. 1500-3000 mLs/day)
 - * The fluid replacement/resuscitation period is commenced from the time of the burn NOT from the time of medical assistance. (ie. if the patient takes 4 hours to reach medical assistance then that 4 hours must be caught up with the resuscitation fluid)

Example: (Patient has 60% burns and weighs 60 kg)

- $2 \times 60\% \times 60 \text{ kg} = 7200 \text{ mL}$
- Give 3600 mL in first eight hours (50%)
- Give 1800 mL in second eight hours (25%)
- Give 1800 mL in third eight hours (25%)

Remember to include daily fluid and total time since the accident

- Regulate IV fluids to maintain the urine output at 0.5-1 mL/kg body weight/hour with a specific gravity of 1020 (NB: 1-2 mL per kilo body weight per hour for electrical burns to flush out the myoglobin)

PATIENTS WHO REQUIRE TRANSFER TO THE BURNS UNIT

- Burns greater than 10% total body surface area
- Circumferential partial thickness or full thickness burns
- Chemical burns
- Electrical burns
- Special Area burns (ie. face, neck, hands, feet, perineum, joint or inhalation burns)

CHECK LIST/INFORMATION REQUIRED BY ROYAL PERTH HOSPITAL FOR PATIENT TRANSFER

- | | |
|--|---|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Patient's name <ul style="list-style-type: none"> <input checked="" type="checkbox"/> age <input checked="" type="checkbox"/> sex <input checked="" type="checkbox"/> address, home telephone <input checked="" type="checkbox"/> religion <input checked="" type="checkbox"/> Next of kin <ul style="list-style-type: none"> <input checked="" type="checkbox"/> relationship <input checked="" type="checkbox"/> address <input checked="" type="checkbox"/> telephone <input checked="" type="checkbox"/> Relatives notified <ul style="list-style-type: none"> <input checked="" type="checkbox"/> relatives travelling to Perth with patient (if not, when) <input checked="" type="checkbox"/> Clothing with victim <input checked="" type="checkbox"/> Valuables with victim <input checked="" type="checkbox"/> Past medical history <ul style="list-style-type: none"> <input checked="" type="checkbox"/> allergies (type of reaction) <input checked="" type="checkbox"/> medications <input checked="" type="checkbox"/> drugs, alcohol or suicide | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Workers compensation <input checked="" type="checkbox"/> First medical certificate given <input checked="" type="checkbox"/> Contact made with Royal Perth Burns Unit <input checked="" type="checkbox"/> Intervention carried out <ul style="list-style-type: none"> <input checked="" type="checkbox"/> IV Fluids <input checked="" type="checkbox"/> fluid balance chart <input checked="" type="checkbox"/> analgesia <input checked="" type="checkbox"/> tetanus toxoid <input checked="" type="checkbox"/> urethral catheter and urinalysis <input checked="" type="checkbox"/> naso-gastric tube <input checked="" type="checkbox"/> oxygen <input checked="" type="checkbox"/> escharotomies (number and location) <input checked="" type="checkbox"/> baseline data (eg. Urea and Electrolytes, Full Blood picture, Carboxy Haemoglobin X-Rays Arterial Blood Cases) <input checked="" type="checkbox"/> Referring nurse/doctor/hospital <ul style="list-style-type: none"> <input checked="" type="checkbox"/> address <input checked="" type="checkbox"/> telephone |
|--|---|

CHEST PAIN (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- | | |
|---|---|
| <ul style="list-style-type: none"> • 12 lead ECG if available • Rate and quality of pulse • Skin colour, cyanosis, pallor • Respiratory status, quality of respirations, unusual chest movement | <ul style="list-style-type: none"> • Anxiety • Any other obvious problems • General appearance • Oxygen 6 litres per minute |
|---|---|

SUBJECTIVE ASSESSMENT

- Pain assessment (see PAIN ASSESSMENT **22**)
- Change in pain with deep inspiration, cough and movement
- Associated symptoms
 - nausea, vomiting
 - shortness of breath
 - sweating
 - cough, productive or non-productive
 - fever
 - radiation of pain
- Measures taken to relieve pain at rest, (eg. Anginine **254**, Antacids, oxygen)
- Past medical history
 - previous myocardial infarction, cardiac surgery, angina
 - medications (in particular, Digoxin, diuretics, beta blockers)
 - risk factors (smoking, positive family history, hypertension, hyperlipidaemia, diabetes mellitus, obesity)
 - recent stress, illness or exertional activity

OBJECTIVE ASSESSMENT

- Complete vital signs, including peripheral pulses (monitor these frequently)
- Level of consciousness **17** (may be diminished because of hypoxia)
- Respiration
 - efficacy of ventilation
 - use of accessory muscles
 - breath sounds
 - compare bilaterally
 - presence of crackles, wheezes
- Skin colour (pale, cyanotic, ashen or flushed)
- Skin temperature (warm, cool)
- Diaphoretic (sweaty)
- Rhythm strip (if monitor available)
- Ankles for swelling and calves for tenderness

DIFFERENTIAL DIAGNOSIS

- Angina
- Pericarditis
- Dissecting aortic aneurysm
- Pneumothorax
- Muscle strain
- Pulmonary embolus
- Shingles
- Myocardial infarction/Severe angina
- Oesophagitis
- Acute Hypertensive Crisis
- Reflux or indigestion
- Pneumonia

FEATURES OF ISCHAEMIC CHEST PAIN (However, some people have atypical symptoms)

- | | |
|---|--|
| <ul style="list-style-type: none">• Onset at rest and/or on physical exertion• Sub-sternal, midline or anterior chest• Radiation, one/both arms, jaw, neck and back• Character, heaviness, vice-like | <ul style="list-style-type: none">• Constant• Ischaemic chest pain is not common in young people• Associated symptoms<ul style="list-style-type: none">– nausea, vomiting, shortness of breath, sweating, skin pale and clammy |
|---|--|

CHEST PAIN (INTERVENTION)

IMMEDIATE ACTION

- Assess
 - Airway
 - Breathing
 - Circulation
- Reassure the patient
- Oxygen 6 litres/minute via Hudson Mask
- Assess pain
- Do 12 lead ECG if available

Features of ischaemic chest pain **67**

NO

- Discuss with Doctor
- Fax 12 lead ECG to Doctor

YES

- Vital signs every 15 minutes
- Attach ECG monitor if available
- Establish IV access **206**
 - give sublingual Glyceryl Trinitrate (Anginine®) **254** if blood pressure greater than 90mmHg systolic (½ tablet if no previous use of Anginine®)
 - 1 tablet if there is a history of Anginine® use
 - may repeat x 3 if BP greater than 90 and pain persists

- Analgesia as per ANALGESIA REGIMEN **227**
- Aspirin 300 mg orally as a single dose.
- May develop PULMONARY OEDEMA **162**
- For Ventricular Tachycardia/Fibrillation see ADULT CARDIORESPIRATORY ARREST **30**

TRANSFER TO HOSPITAL

CHOKING (INFANT TO 1 YEAR)

(Adapted with permission from Australian First Aid, St John Ambulance Australia, 1998)

NOTE: Most CHILDREN will clear an airway foreign body themselves WITHOUT INTERVENTION. Immediate intervention may interfere with this. Consider the following if this does not happen within a brief period.

CHECK AIRWAY AND BREATHING TO ASSESS BLOCKAGE

PARTIAL BLOCKAGE

1. Lie infant face down on your forearm with head low
2. Support infant's head and shoulders on your hand
3. Give 4 sharp slaps between shoulders
4. Check infant's mouth and remove any obstruction that may have come loose
5. Check airway and breathing.



IF BLOCKAGE HAS NOT CLEARED

6. Repeat steps 1-5
7. If you can not remove the blockage, give oxygen, keep patient calm and evacuate



TOTAL BLOCKAGE

1. Place infant on your lap
2. Give 4 sharp slaps between shoulders
3. Remove foreign object
4. Check airway and breathing



IF STILL NOT BREATHING

5. Give lateral chest thrusts by placing one hand in either side of the infant's chest below the armpits and giving up to 4 quick, squeezing thrusts on both sides simultaneously
6. Check infant's mouth and remove any obstruction that may have come loose
7. Check airway and breathing

IF BLOCKAGE HAS NOT CLEARED

8. Repeat steps 1 to 7 until blockage clears
9. After 3 cycles if blockage HAS NOT cleared perform Needle Cricothyrotomy. **207**



CHOKING CHILD

(Adapted with permission from Australian First Aid, St John's Ambulance Australia, 1998)

CHECK AIRWAY AND BREATHING TO ASSESS BLOCKAGE

PARTIAL BLOCKAGE

1. Ask the child to try to cough up obstruction and spit it out

IF UNSUCCESSFUL

2. Place child in a position with head low and face down (up-end or bend over your knee)
3. Give 4 sharp blows between the shoulder blades
4. Get them to spit out the blockage
5. Check airway and breathing



IF BLOCKAGE HAS NOT CLEARED

6. Repeat steps 1 to 5
7. If you can not remove the blockage, give oxygen, keep patient calm and evacuate



TOTAL BLOCKAGE

1. Place child face down on the floor or across your lap
2. Give 4 sharp blows between the shoulder blades
3. Remove any loose objects
4. Check airway and breathing

IF STILL NOT BREATHING

5. Give lateral chest thrusts by placing one hand either side of child's chest below the armpits and giving up to 4 quick, squeezing thrusts on both sides simultaneously
6. Remove any loose objects
7. Check airway and breathing

IF BLOCKAGE HAS NOT CLEARED

8. Repeat steps 1 to 7
9. After 3 cycles if blockage HAS NOT cleared perform Needle Cricothyroidotomy **207**



CHOKING ADULT

(Adapted with permission from Australian First Aid, St John's Ambulance Australia, 1998)

CHECK AIRWAY AND BREATHING TO ASSESS BLOCKAGE

PARTIAL BLOCKAGE

1. Encourage person to relax and breath deeply
2. Ask person to cough to remove object

IF UNSUCCESSFUL

3. Bend person well forward
4. Give 4 sharp blows between shoulder blades
5. Ask person to spit out object
6. Check airway and breathing

IF BLOCKAGE HAS NOT CLEARED

7. Repeat steps 3 to 6
8. If you can not remove the blockage, give oxygen, keep patient calm and elevated



TOTAL BLOCKAGE

1. Lie person on their side on the floor
2. Give 4 sharp blows between the shoulder blades
3. Remove any foreign objects
4. Check airway and breathing

IF STILL NOT BREATHING

5. Give lateral chest thrusts by placing your hands on the side of person's chest below the armpit and giving 4 quick downward thrusts
6. Remove any foreign objects
7. Check airway and breathing

IF BLOCKAGE HAS NOT CLEARED

8. Commence EAR. If still obstructed repeat lateral chest thrusts every 60 seconds alternating with EAR/CPR for one minute
9. Repeat steps 1 to 7
10. After 3 cycles if blockage HAS NOT cleared perform Needle Cricothyroidotomy **207**



COLLAPSE

Never underestimate the condition of the collapsed patient - their condition can deteriorate rapidly.
NEVER leave these patients unattended.

CONSIDER THAT THE PATIENT MAY HAVE HAD A FIT IF:

- | | |
|---|---|
| <ul style="list-style-type: none"> • History of fits <ul style="list-style-type: none"> – localised or generalised – duration • Incontinence | <ul style="list-style-type: none"> • Tongue biting • Injury to head • Obvious wounds, bleeding, ecchymosis should be noted • Evidence of vomitus on clothes |
|---|---|

SOME COMMON CAUSES OF COLLAPSE

- | | |
|---|---|
| <ul style="list-style-type: none"> • Alcohol 39 • Head Injury 191 • Cardiac Arrest • Anaphylaxis 43 • Arrhythmia • Hyperthermia/Hypothermia 88 89 • Hypovolaemia 170 • Central Nervous System (CNS) Infection • Pulmonary Embolus • Cerebral Vascular Accident (CVA) | <ul style="list-style-type: none"> • Septicaemia • Diabetic Hypoglycaemia 86 • Subarachnoid Haemorrhage • Diabetic Ketoacidosis 83 • Transient Ischaemic Attack • Drugs • Poisoning 144 • Snake Bite 53 • Hepatic Coma |
|---|---|

COLLAPSE (FOCUSSED ASSESSMENT)

KEY ASSESSMENT POINTS	
<ul style="list-style-type: none"> • ABC - Airway, Breathing, Circulation • Level of consciousness 17 	<ul style="list-style-type: none"> • Respiratory status • Skin colour, ie. pallor, cyanosis, flushed, sweating, mottled, jaundiced

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Information should be obtained from family, witnesses, and ambulance personnel. Focus on presenting problem • History of collapse <ul style="list-style-type: none"> - how and where patient was found - time patient was last seen before collapse • Other clues, such as medication bottle, alcohol, extremes in temperature, evidence of trauma; search clothing. 	<ul style="list-style-type: none"> • General appearance <ul style="list-style-type: none"> - note body position, level of consciousness, sex, age, nutritional state, skin colour and warmth, any obvious injuries and deformities • Colour of skin should be noted <ul style="list-style-type: none"> - cyanosis indicates hypoxia (check tongue) - jaundice indicates liver damage - pallor usually indicates some degree of shock - flushed (patient may have fever) - mottled appearance could indicate sepsis - note temperature of skin and any sweating • Vital signs <ul style="list-style-type: none"> - temperature (for accuracy do a rectal reading). If low, use low-reading thermometer • Pulse (note rate, volume, regularity) <ul style="list-style-type: none"> - rapid suggests blood loss, hypoxia, arrhythmia - slow suggests raised intracranial pressure, arrhythmia, vaso-vagal response • Blood pressure.

OBJECTIVE ASSESSMENT (cont'd)

- high suggests cerebral bleeding, hypoxia
- low suggests hypothermia, blood loss, drug overdose
- Respirations: note rate, depth, rhythm
 - rapid suggest chest infection, acidosis
 - slow suggests head injury, overdose
 - 'wheeze' may suggest asthma
 - 'bubble' may indicate pulmonary oedema

HEAD-TO-TOE ASSESSMENT

Use systems approach or functional method of assessment.

All clothing must be removed to enable adequate head to toe assessment. Work systematically from head-to-toe.

CHECK:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Confirm integrity of skull and scalp noting any leakage of cerebrospinal fluid (CSF) from nose or ears • Pupil size, equal and reacting to light 20 <ul style="list-style-type: none"> - unequal pupils suggest brain damage - pin-point pupils suggest morphine/heroin or brainstem stroke - dilated pupils suggest respiratory failure or drugs such as amphetamines | <ul style="list-style-type: none"> • Neck stiffness indicates meningeal irritation • Grade level of consciousness and response to stimuli (use Glasgow Coma Scale 17) • Is patient moving all four limbs? • Odour of breath (alcohol, ketones, urea, almonds) |
|--|--|

COLLAPSE (INTERVENTION)

UNRESPONSIVE PATIENT


CONSIDER EASILY REVERSIBLE CONDITIONS

1. Check BLOOD SUGAR LEVEL (with Glucometer if available)
 - low blood sugar level < 4mmol/litre (see HYPOGLYCAEMIA **86**)
 - high blood sugar level > 16mmol/litre (see HYPERGLYCAEMIA **83**)
 - HYPOGLYCAEMIA (low blood sugar) is rapidly reversed by giving 50 mL glucose 50% IV (1 mL per kg in children under 12) **253** or sublingual glucose paste
 - other conditions are not seriously affected
2. NARCOTIC OVERDOSE
 - coma with pinpoint pupils
 - look for needle marks on limbs
 - Reversed by Naloxone, give Naloxone 0.4 microgram IV. But as the narcotic may have a longer-lasting effect than the Naloxone, the Naloxone may have to be repeated **278**
 - The clinical picture of coma with pinpoint pupils may also be produced by brainstem injury. Naloxone will not affect this condition.

- Vital Signs
 - Hypotension (consider hypovolaemic shock, haemorrhage, see SHOCK **170**)
 - Check neurological status (see GLASGOW COMA SCALE **17**)
- Oxygen at 12 litres/minute
- Immobilise cervical spine with firm collar

RESPONSIVE PATIENT

- Obtain history
- Give oxygen at 6 LPM
- Assess vital signs
- Check neurological status (see GLASGOW COMA SCALE **17**)

- 
- History, consider
 - snake-bite **53**
 - cervical spine injury – priapism (persistent erection of the penis **197**)
indicative of spinal cord injury
 - diabetes mellitus
 - Establish IV access **206**
 - if BP less than 85 mmHg systolic give bolus of colloid solution (Gelofusine®) 500 mL IV **249**
 - may repeat x 1
 - follow with Hartmann's solution **240**
 - Insert nasogastric tube
 - Insert urinary catheter
 - Urinalysis
 - Refer to appropriate Emergency Intervention Sections as indicated by results of assessment

TRANSFER TO HOSPITAL

DECOMPRESSION ILLNESS (DCI)

Authorised by Dr Robert Wong - Director and Sue Thurston – Clinical Nurse Manager
Department of Diving and Hyperbaric Medicine – Fremantle Hospital and Health Service - 02 November 2004

Contact Fremantle Hospital and Health Service – (08) 9431 3333 - ask to speak to the Hyperbaric Doctor

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

All symptoms occurring up to 24 hours after SCUBA diving in an otherwise fit/healthy person should be considered DCI until proven otherwise.

FOCUSSED ASSESSMENT

- | | |
|---|--|
| <ul style="list-style-type: none"> Full history including details of dive(s) (number, duration, depth, surface intervals, decompression stops, rapid ascent) | <ul style="list-style-type: none"> Conscious state 17 Also consider other causes (eg. injury, marine bite or sting, heart attack, fit, near drowning) |
|---|--|

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> Symptoms may occur immediately after SCUBA diving or develop up to 24 hours later Skin itching, rashes, swelling Joint pains (“the bends”) Tiredness, generally feeling unwell Chest pain, breathlessness, cough, coughing up blood Deafness, ringing in the ears, sensation of surroundings spinning Nausea, vomiting Numbness, muscle weakness, paralysis, urinary retention Headache, confused, drowsy, unconscious, fitting 	<ul style="list-style-type: none"> Lie flat. Raising the head may cause sudden deterioration and death due to a large gas bubble travelling to the brain. KEEP FLAT until patient reaches recompression chamber Give oxygen with a non-rebreathing mask or as close to 100% as possible Check BP and heart rate Consult doctor and then Hyperbaric Medical advice as soon as possible Oral clear fluids if doctor advises Insert IV cannula 206 Give Normal Saline or Hartmann’s (1 litre every 8 hours) 296 240 Analgesia for patients with severe pain, should only be given on Medical Advice (May mask symptoms). See ANALGESIA REGIMEN 227 (Entonox MUST NOT BE USED as it will expand the size of the nitrogen bubble in the bloodstream, further exacerbating the problem)

FAMILY AND DOMESTIC VIOLENCE (FDV)

Based on a number of documents developed by the Department of Health Western Australia, including *Guidelines for Developing Protocols on Intervention and Management of FDV for Hospitals in WA* and other support material. These are available electronically from <http://www.health.wa.gov.au>. Any staff likely to encounter cases of FDV should seek appropriate and regular training in the area.

DEFINITION

FDV is a crime that occurs when one person attempts to control and dominate another in an intimate or familial relationship. FDV is a gendered crime, perpetrated mainly against women and children and manifests in a variety of forms that include physical, psychological, economic, social and sexual violence. FDV can be perpetrated against males and the elderly.

YOUR ROLE AS A HEALTH PROFESSIONAL

Your role is to form a key link not only in the treatment of immediate symptoms, but also in arranging follow up support and specialised counselling available from service providers outside the health system itself. Apart from counselling, women experiencing FDV may need support with accessing the family court system, accommodation and financial support. A sound referral system is essential in empowering those affected to break the cycle of violence in their lives.

SAFETY, CONFIDENTIALITY AND REPORTING TO POLICE

Patients' privacy and confidentiality should be maintained. However, their current and future safety must be regarded as paramount in the intervention of FDV. At the same time, staff must also consider their own safety, both emotional and physical, when raising the issue of FDV, particularly if the suspected perpetrator is nearby or known. This is likely to be of particular concern in small and remote communities.

The police have an important role to play in reducing violence and have increased legislative powers to deal with FDV. Patient consent should be obtained before reporting to police. However, in life-threatening cases where consent has not been granted, staff must make a 'considered' professional decision about notifying police authorities. If in doubt, confer with senior staff if possible, document the patient's refusal to sign a consent form and attempted methods used seek consent. Documentation should also include the details of the circumstances that were considered necessary to notify police without consent. If there is a threat to staff safety you may enlist police assistance in your own right.

PATIENT RECORDS

Maintenance of complete and comprehensive case records is important for the care of patients and may be used in future legal proceedings.

SPECIAL POPULATIONS

It is essential that you respond sensitively, considering the special needs of certain populations (eg. pregnant women, Aboriginal families, some ethnic communities, the elderly, same-sex couples and rural women).

SIGNS AND SYMPTOMS OF FDV

Physical abuse signs and symptoms

- Head, neck and facial injuries
- Unexplained physical injuries
- Multiple and bilateral soft tissue injuries, especially contusions and abrasions
- Injuries on parts of the body hidden from view (eg. injuries to breast, abdomen and/or genitals)
- Bruises of various ages
- Ongoing complaints of poor health (eg. chronic pain syndrome)
- Previous history of violence in the family
- Back pain, neck stiffness
- Headaches, dizziness, numbness
- Palpitations
- Miscarriage and other pregnancy complications
- History of gynaecological problems
- Substantial delay between time of injury and presentation for treatment

Psychological and emotional signs and symptoms

- Emotional distress ie. anxiety, indecisiveness, confusion, hostility
- Unexplained somatic complaints
- Repeated visits to hospital ED. Patients may not present FDV as a complaint or reason for visit
- Sleep disturbances
- Depression
- Substance abuse, including prescribed drugs
- Self-harm behaviours/suicide attempts
- Withdrawal from touch
- Client is evasive or embarrassed of injuries
- Partner speaks for the client and/or insists on remaining with client

Signs of homicidal risk

Any of these indicators should be taken seriously because they show that the homicidal risk is high.

- Availability of gun in the home
- Perpetrator killed animal/pets with suspected intention to terrify spouse or family member
- If victim reports high homicidal risk factor
- Use of drugs and alcohol by perpetrator
- Where perpetrator is violent to people outside his/her family

PROVIDE A SUPPORTIVE ENVIRONMENT

Gaining cooperation of a person who has suffered FDV can be difficult. The victim may require a lot of validation and affirmation.

- In the process of identifying and managing FDV, it is critical to remain sensitive and non-judgemental
- Accept the patient's story and let the patient know that you accept his/ her story
- Reinforce that FDV is against the law, and inform him/her that he/she does not have to live with the violence
- Inform patient that he/she is not alone. There are other women/ men experiencing FDV
- Affirm that patient has made an important step in seeking help
- Reinforce that patient should learn not to self-blame, and that the abuser ought to be taking responsibility for the violence

COMMUNITY RESOURCES

Crisis Care Unit (24 hours) <i>Crisis line for families and children plus practical assistance</i>	(08) 9325 1111 1800 199 008
Women's Refuge Group of WA Inc <i>Information on refuges and safe houses in WA</i>	08 9420 7264
Women's Refuges Multicultural Services <i>Outreach, information, advocacy, referral and support service for women and children of non-English speaking background leaving family violence</i>	08 9328 1200 www.omi.wa.au
Domestic Violence Unit, help line <i>Advises and assists those escaping domestic violence.</i>	08 9261 9223 08 9261 1199 1800 000 599 1800 007 339
Interpreter service (24 hours)	13 14 50

Reviewed November 2004

GASTROINTESTINAL BLEEDING

Adapted from Primary Clinical Care Manual, (2003) with permission from the North Queensland Rural Health Training Unit.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

UPPER GASTROINTESTINAL BLEEDING

KEY ASSESSMENT POINTS

- Past history of peptic ulcer or previous episode/s
- Current medication, especially Aspirin or non-steroidal anti-inflammatory drugs
- Rectal examination

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none">• Burning pain in epigastrium or retrosternally• Haematemesis (coffee grounds or fresh blood)• Passing melena• Hypotension/shock• Postural hypotension (\downarrow BP by >20mmHG on sitting/standing)	<p>Oxygen 6 litres/minute</p> <ul style="list-style-type: none">• Check vital signs• If hypotension/shock or large haematemesis or melena insert large bore IV cannula (14g if possible otherwise 16g) 206• Give crystalloid and follow with colloid (see SHOCK 170)• Consult doctor urgently who will advise further management and arrange evacuation
TRANSFER TO HOSPITAL	

RECTAL BLEEDING

FOCUSSED ASSESSMENT

- Change in bowel habit (mucoid diarrhoea or constipation)
- Sense of rectal urgency or unsatisfied defecation
- External examination of anus looking for evidence of haemorrhoids and bleeding

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Bright red blood loss • Melena (black tar-like bowel motion, foul smelling: blood changed by digestion in upper Gastrointestinal Tract) • Postural hypotension (↓ BP by >20mmHG on sitting/standing) • Shock 170 	<ul style="list-style-type: none"> • If passing melena bowel motions see UPPER GI BLEEDING 81 • If hypotension/shock or bleeding heavy or continuing insert large bore IV cannula (14g if possible otherwise 16g) 206 • Give crystalloid follow with colloid (see SHOCK 170) • Consult doctor urgently who will advise further management and arrange evacuation
TRANSFER TO HOSPITAL	

HYPERGLYCAEMIA (FOCUSSED ASSESSMENT)

BLOOD SUGAR LEVEL GREATER THAN 16mmol/litre INDICATES HYPERGLYCAEMIA

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

There are two types of Diabetic Coma

1. DIABETIC KETOACIDOSIS (DKA), which occurs in Type 1 (Insulin dependent) diabetes; and
2. HYPEROSMOLAR NON-KETONIC COMA (HNKC), which occurs in Type 2 (non-insulin dependent) diabetes.

The symptoms and treatment are similar; the main difference being that Ketoacidosis is present in the former (1) but not the latter (2). For patient with HYPEROSMOLAR NON-KETONIC COMA the guidelines for management are that fluids and Insulin are administered at HALF the listed rate (ie. Insulin at 2.5 u/hour). (**85** for Intervention)

KEY ASSESSMENT POINTS

- Level of consciousness **17**
- Blood sugar (use Glucometer if available)

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Obtain history of current episode <ul style="list-style-type: none"> – nausea and vomiting – polyuria – polydipsia – blurring of vision – recent acute illness, infection or injury – failure to take insulin (if insulin-dependent diabetic) – malaise, lethargy – abdominal pain (may be a feature of DKA or indicate an abdominal disorder which may have precipitated the hyperglycaemic episode) • Medical History <ul style="list-style-type: none"> – known diabetes mellitus (hyperglycaemic episode may, however, occur in patients not previously known to have diabetes) 	<ul style="list-style-type: none"> • Blood sugar above 16mmol/litre (often 50-60mmol/litre in acute hyperglycaemia) • Vital Signs <ul style="list-style-type: none"> – hypotension and tachycardia due to hypovolaemia – Kussmaul respirations (exaggerated breathing with increased tidal volume in response to acidosis) and 'fruity' odour of breath in DKA – temperature (there may be fever but hypothermia is more common) • Observe for signs of dehydration <ul style="list-style-type: none"> – poor skin turgor – dry mucous membranes – sunken eyeballs • Mental status <ul style="list-style-type: none"> – use Glasgow Coma Scale (deep coma with unresponsiveness to painful stimuli is NOT UNCOMMON while some patients will respond to verbal stimuli but will be stuporous and incoherent)

HYPERGLYCAEMIA (INTERVENTION)

PATIENT UNCONSCIOUS	PATIENT CONSCIOUS
<ul style="list-style-type: none"> • Manage as for COLLAPSED PATIENT 75 • Respiration (note character and odour- fruity/acetone) • Check Blood Sugar Level hourly (using Glucometer if available) • Insert urinary catheter to monitor urinary output • Test urine (look for ketonuria) • Establish IV access 206 • Crystalloid Normal Saline 296 OR use colloid/ Gelofusine® 249 if shock is present <ul style="list-style-type: none"> – when blood sugar level drops to 15mmol/litre replace with 5% Glucose solution 252 – 1 litre first hour, 1 litre over next 2 hours, 1 litre over next 4 hours • Give a bolus dose of 10 units of short-acting Insulin IV 261 <ul style="list-style-type: none"> – check Blood sugar level, if >16-17mmol, continue with infusion of 5 units per hour (administered using 50 units of insulin in 500 mL Gelofusine® or Normal Saline or give 5 units/hour as bolus) 249 296 	<ul style="list-style-type: none"> • Give oxygen at 6 litres/minute • Assess <ul style="list-style-type: none"> – vital signs every 15 minutes – neurological state - Glasgow Coma Scale 17 – check blood sugar level hourly using Glucometer (if available) • Monitor urinary output • Test urine • Establish IV access 206 (Normal Saline 296) <ul style="list-style-type: none"> – 1 litre first hour, 1 litre over next 2 hours, 1 litre over next 4 hours • Give bolus of 10 units of short-acting insulin 261 <ul style="list-style-type: none"> – check blood sugar level. If >16-17mmol, commence infusion of 5 units per hour (see actions for UNCONSCIOUS PATIENT)
TRANSFER TO HOSPITAL	

HYPOGLYCAEMIA

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SIGNS AND SYMPTOMS

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Blood sugar level of less than 4mmol/litre • Rapid pulse | <ul style="list-style-type: none"> • Feel dizzy, weak, trembly • Hungry, pale, sweating profusely | <ul style="list-style-type: none"> • Appear confused or aggressive • Unconscious |
|---|---|--|

INTERVENTION**PATIENT UNCONSCIOUS**

- Insert airway
- Give oxygen at 12 litres/minute
- Check blood sugar level (use Glucometer if available)
- Check vital signs
- Establish IV access **206**
- If blood sugar level less than 4mmol/litre or patient unconscious give Glucose 50% - 50 mL IV **253**
- If IV access NOT AVAILABLE, give Glucagon 1.0 mg IM (recovery will take 15-20 minutes) **251**

WHEN PATIENT IS FULLY CONSCIOUS

- Give liquid carbohydrates followed by complex carbohydrates (eg. sandwich); otherwise may rebound
- Check blood sugar level

PATIENT CONSCIOUS

- Administer oxygen at 6 litres/minute
- Check blood sugar level (use Glucometer if available)
- Give simple sugars orally (eg. fruit juice, barley sugar)
- Test urine
- Consult doctor

TRANSFER TO HOSPITAL

HYPERTENSIVE EMERGENCY

Reference: Fremantle Hospital and Health Service; Vidt 2003 (<http://www.clevelandclinicmeded.com/diseasemanagement/nephrology/crisis/crisis.htm>)

A hypertensive emergency exists when the diastolic blood pressure is greater than 120mmHg and the patient is symptomatic.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

INDICATIONS FOR IMMEDIATE ANTIHYPERTENSIVE TREATMENT

- Diastolic Blood Pressure greater than 110-120mmHg with:
 - central nervous system disturbance, eg. headache, confusion, transient neurological signs **17**
 - cardiovascular system disturbance, eg. cardiac failure
- Lower blood pressure reading but indications of sub-arachnoid haemorrhage, retinal detachment or pregnancy induced hypertension

REMEMBER: Lowering blood pressure too fast can lead to stroke, Myocardial infarction and renal failure.
Your aim, if you HAVE TO TREAT, is only to reduce the blood pressure by 10%.

ACTION

- Contact Doctor
- Vital signs every 15 minutes
- Lie patient down in quiet place for 30 minutes, (Do not lie the patient flat, have their head raised)
- If BP remains above 120mmHg diastolic after 30 minutes rest, give Captopril PO 25 mg
- Effects improved with coadministration of loop diuretic
 - use Hydralazine 5 mg slowly IV **258**
 - repeat in 30 minutes if Blood Pressure remains unchanged
- If evidence of pulmonary oedema consider Frusemide 20-40 mg IV **247**

TRANSFER TO HOSPITAL

If patient is pregnant refer to PRE-ECLAMPSIA **118**

HYPERTHERMIA (HEAT STROKE)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

FOCUSSED ASSESSMENT

- | | |
|---|--|
| <ul style="list-style-type: none"> • Core temperature (rectal) greater than 40 degrees Celsius • Hot, dry skin • Tachycardia | <ul style="list-style-type: none"> • Central nervous system disturbance (ie. headache, nausea, vomiting, abdominal pain, confusion, delirium, irritability, twitching, convulsions, coma) |
|---|--|

INTERVENTION

- | | |
|---|---|
| <ul style="list-style-type: none"> • Consider INTRAOSSEOUS INFUSION if IV access not possible 205 • Reduce temperature urgently to 39 degrees <ul style="list-style-type: none"> – apply wrapped ice to axilla, neck and groin – apply wet towels to body – use fans/air conditioning • Give oxygen at 6 litres/minute • Establish IV access 206 • If history indicates that collapse was preceded by heavy perspiration, rehydrate with Hartmann's 240 or Normal Saline 296 <ul style="list-style-type: none"> – give 20 mL/kg stat then 5 mL/kg per hour, otherwise give 500 mL over 30 minutes – assess adequacy of rehydration by urinary output (more than 0.5 mL/kg/hour) | <ul style="list-style-type: none"> • Insert urinary catheter and monitor output hourly • Vital signs every 15 minutes (including temperature) • Check blood sugar level (use Glucometer if available) • If cooling is being inhibited by shivering, may give Chlorpromazine 25-50 mg IV |
|---|---|

TRANSFER TO HOSPITAL

- | |
|--|
| <ul style="list-style-type: none"> • If CONVULSING or muscle rigidity give Diazepam 243 IV or rectally (See SEIZURES section 165) • If HYPOGLYCAEMIC or unable to measure blood sugar level give 50 mL 50% Glucose 253 IV (1 mL per kg for children under 12) (See HYPOGLYCAEMIA 86) |
|--|

HYPOTHERMIA

Reference: Harrison's Online

HIGH RISK OF CARDIAC ARREST, SO HANDLE WITH CARE

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

FOCUSSED ASSESSMENT

ASSESSMENT	SIGNS AND SYMPTOMS
Mild 32.2 – 35 degrees	Apathy, impaired judgement, tachycardia, tachypnoea, diuresis, shivering – Not life threatening. Patient should be treated with passive rewarming and monitored until temperature reaches 36 degrees
Moderate <32.2 – 28	Decreasing loss of consciousness, dilated pupils, ECG abnormalities, bradycardia, decreased cardiac output, hypoventilation, decreased shivering/rigidity
Severe <28	Coma, hypotension, pulmonary oedema, extreme oliguria, bradycardia, arrhythmias, asystole

INTERVENTION

- Monitor closely
- Attach cardiac monitor if available (monitor cardiac rhythm)
- Gently remove any wet clothing (protect cervical spine)
- **DO NOT ADMINISTER ANY DRUGS**
- Provide slow natural warming by wrapping patient (use space blanket)
 - warm trunk then limbs to prevent sudden vasodilatation
- Administer oxygen at 12 litres/minute

TRANSFER TO HOSPITAL

Always CONTINUE CPR until transfer, as some remarkable recoveries occur with hypothermia
'NO ONE IS DEAD UNTIL WARM AND DEAD'

MENINGITIS BACTERIALReferences: DoH, 2002, <http://www.patient.co.uk/showdoc/23069082> (2002)**(COMMONLY MENINGOCOCCAL BUT CAN BE OTHER BACTERIA SUCH AS PNEUMOCOCCUS)**Also see PAEDIATRIC MENINGITIS **133**

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SIGNS AND SYMPTOMS ADULTS AND OLDER CHILDREN

Non-specific	More specific	Late
Fever	Neck stiffness	Coma
Vomiting	Photophobia	Shock
Diarrhoea	Confusion	Widespread haemorrhagic rash
Back and joint/muscle pain	Drowsiness	
Headache	Petechial or purpuric non-blanching rash	
Maculo-papular rash (early)		

SEPTICAEMIA VS MENINGITIS

Signs and symptoms	Septicaemia	Meningitis
Fever, usually high	X	X
Drowsiness / confusion	X	X
Agitation / distress	X	X
Vomiting	X	X
Severe headache		X
Stiff neck		X
Pain on flexion of neck		X
Rash	X	X (not always)
Muscle / joint / abdominal pain	X	X
Cold hands / feet	X	
Tachpnoea	X	

INTERVENTIONS

- Apply oxygen 6 L/min
- Monitor neurological observations
- Perform vital signs
- Establish IV access (if possible) **206**
 - **If IV access obtained quickly, obtain blood cultures prior to administration of antibiotics but do not delay antibiotic therapy**
 - if shocked give 10 – 20 mL/kg crystalline IV fluid
- Commence drug therapy (prior to transfer, do not delay while attempting IV cannulation)
- Ceftriaxone 50 mg/kg to max of 2G IV or IM **238** (can be mixed with Lignocaine 0.5% if giving IM **266**)

URGENT TRANSFER IS IMPERATIVE

NEAR DROWNING (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- Respiratory status, ie. airway, ventilation rate
- Level of consciousness **17**
- Colour

SUBJECTIVE ASSESSMENT

- History of drowning episode
 - get witness account of event if possible
 - water temperature
 - type of water (fresh, salt, contaminated, eg. river, sea, dam)
 - cause of exposure, such as alcohol, drugs, inability to swim, other medical event eg. seizure
 - length of immersion
 - hyperventilation before underwater swimming
 - note any pre-admission treatment
- History of additional trauma (diving accident, cervical spine injury, concussion, skull fracture)
- Past medical history
 - chronic disease (epilepsy, cardiac problems, asthma, airway disease)
 - recent history of respiratory illness (pneumonia, upper respiratory tract infection)
 - suicide intentions, other psychiatric problems
- Associated symptoms, eg. chest pain

OBJECTIVE ASSESSMENT

- Complete vital signs
 - rectal temperatures (beware hypothermia)
 - bradycardia/tachycardia may be present
 - blood pressure (may be hypotensive)
- Respiratory status
 - patency of airway
 - respiratory effort: pattern and quality of ventilation (dyspnoea, wheezing, cough)
 - breath sounds: crackles, wheeze
- Level of consciousness will vary
 - confusion, irritability, restlessness, lethargy, seizures, coma
- Shock is uncommon in near drowning. If present, it is usually the result of an underlying cause such as hypovolaemia, hypoxia, spinal or other injury

NEAR DROWNING (INTERVENTION)

CONSIDER CERVICAL SPINE INJURY IF DIVING ACCIDENT (see SPINAL INJURY)

197

Assess airway, breathing and circulation. Commence Basic Life Support (CPR) if necessary 28

2 RESCUERS
(patient not responding to CPR)

- Check rectal temperature
- Rewarm patient if temperature is low (see HYPOTHERMIA 89)
- Continue CPR until core temperature greater than 35°

1 RESCUER
(give CPR as priority)

Once airway, breathing and circulation established

- Give oxygen at 12 litres/minute
- If dyspnoea persists, give Salbutamol 5 mg (adult) with oxygen via nebuliser 292
- Carefully remove wet clothing (protect cervical spine)
- Keep patient warm using blankets (use a space blanket under other blankets)
- Establish IV access 206
- Serial vital signs
 - if BP less than 85mmHg systolic give bolus of Colloid 500 mL IV, may repeat x 1 249
 - follow with normal solution 296

TRANSFER TO HOSPITAL

NOTE: Pulmonary oedema may be a late complication up to 48 hours after incident

Obstetric advice can be obtained from KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199 or 08 9340 2222 and page 2199 for Triage Midwife

BLEEDING DURING PREGNANCY

BLEEDING IN EARLY PREGNANCY (BEFORE 20 WEEKS)	BLEEDING AFTER THE 20 th WEEK OF PREGNANCY (ANTEPARTUM HAEMORRHAGE)
<ul style="list-style-type: none"> • Without pain <ul style="list-style-type: none"> – assess using BLEEDING DURING PREGNANCY 95 • With severe pain <ul style="list-style-type: none"> – assess using ABDOMINAL PAIN ASSESSMENT 35 – use speculum to examine vagina for products of conception • Differential diagnosis <ul style="list-style-type: none"> – threatened, incomplete or complete abortion – cervical lesions – ectopic pregnancy (intact or ruptured) – hydatidiform mole 	<ul style="list-style-type: none"> • Bleeding at any time after the 20th week of pregnancy should be of concern, except for a slight amount of blood and mucous 'show' common at the initiation of labour • The extent of the bleeding and condition of the woman and the fetus will determine the urgency of the situation

BLEEDING DURING PREGNANCY (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

DO NOT DO VAGINAL EXAMINATION until, or unless, placenta localisation is known (placenta praevia, or succenturiate lobe over os must be excluded) except for gentle speculum examination if competent to do so

REMEMBER: Maternal shock and fetal distress may be out of proportion to visible blood loss as blood may be trapped behind placenta (it may even be a completely concealed bleed). Labour may commence at any time

PLACENTAL ABRUPTION AND PLACENTA PRAEVIA (Bennett and Brown 1999)

The two main conditions that cause bleeding AFTER THE 20th week of pregnancy are placental abruption and placenta praevia. The location of the placenta is perhaps the most critical piece of information to differentiate between the two. The following assessment points will help the doctor to make that differentiation. You may not be able to assess the last two points.

KEY ASSESSMENT POINTS	
Pain	Did the pain precede bleeding and is it continuous or intermittent?
Onset of bleeding	Was this associated with any event such as coitus?
Amount of visible blood	Is there any reason to suspect that some blood has been retained in utero?
Colour of the blood	Is it bright red or darker in colour?
Degree of shock	Is this commensurate with the amount of blood visible or more severe?
Consistency of the abdomen	Is it soft or tense and board-like?
Tenderness of the abdomen	Does the mother resent abdominal palpation or complain of pain with palpation?
Audibility of fetal heart	Is the fetal heart heard?
Lie, presentation and engagement	Are any of these abnormal when taking account of parity and gestation?
Ultrasound scan	Does a scan suggest that the placenta is in the lower uterine segment?

OTHER KEY ASSESSMENT POINTS

- Blood loss per vaginum
- Skin colour
- Level of consciousness **17**
- Sweating
- Anxiety

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Events leading to seeking help <ul style="list-style-type: none"> – bleeding (amount and length of time) – pain (continuous or intermittent) – trauma (eg. recent fall/car accident/ domestic violence) – coitus • Obstetric history <ul style="list-style-type: none"> – parity – gestation/estimated due date – antenatal history (ask woman or relative for details if necessary) – antenatal care – complications of previous pregnancies • Medical /surgical history <ul style="list-style-type: none"> – blood group, rhesus factor – hypertension – diabetes – bleeding disorders – previous surgery 	<ul style="list-style-type: none"> • Extent of blood loss <ul style="list-style-type: none"> – estimate (save all blood loss/clots etc, for measuring and weighing) – appearance of blood (old, bright) • Vital signs <ul style="list-style-type: none"> – signs of shock must be looked for – hypotension – prolonged blanching following rapid release of pressure to nailbeds – pulse increase of 10 or more with postural change (may feel faint) – if blood pressure greater than 140/90 assess for oedema of face, sacrum, ankles, fingers and proteinuria; woman may also have pre-eclampsia <div style="background-color: #800040; color: white; text-align: center; padding: 5px;"> <p>REMEMBER: 1000 mL OF BLOOD CAN BE LOST BEFORE VITAL SIGNS ARE AFFECTED</p> </div> <ul style="list-style-type: none"> • Gentle abdominal examination <ul style="list-style-type: none"> – contractions (frequency, duration, strength) – tenderness and tenseness of uterus – fundal height (ie. height from the of top of the pubic bone to top of the uterus) • Urinalysis • Urine output

ANTEPARTUM HAEMORRHAGE (>20 weeks gestation) (INTERVENTION)

IN ALL CASES

The position of the placenta should be known before any vaginal examination is attempted

- | | |
|--|---|
| <ul style="list-style-type: none"> • Take obstetric history, assess general condition and reassure woman • Determine history of bleeding (onset, duration, gestation, previous obstetric problems) • Assess blood loss (amount, rate, colour – fresh, brown or watery discharge, number of clots or not clotting) • Assess pain – note any changes in severity • Assess fundal height (measurement in cms from top of pubic bone to top of uterus), lie, presentation uterine activity and tenderness (soft, hard, woody) | <ul style="list-style-type: none"> • Establish IV access 206 • Vital signs every 15 minutes • Give oxygen at 6 litres/minute, only if woman is haemodynamically compromised • Test urine • Place in left lateral position • Check fetal movements/fetal heart rate (normal 120-160/minute) • Nil by mouth |
|--|---|

TRANSFER TO HOSPITAL

WOMAN STABLEz

WOMAN UNSTABLE

WOMAN STABLEz		WOMAN UNSTABLE	
SIGNS & SYMPTOMS	INTERVENTION	SIGNS & SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Blood pressure normal • Pulse normal or slightly elevated • Colour normal • Blood loss minimal or decreasing 	Observe closely and document: <ul style="list-style-type: none"> – blood loss – onset of labour – fetal heart rate – maternal vital signs 	<ul style="list-style-type: none"> • Blood Pressure < 85mmHg systolic • Pulse >120 and thready • Skin pale and sweating • Faint OR • Blood pressure greater than 160/100 mmHg and proteinuria (ie. woman may have PRE-ECLAMPSIA 118) 	<ul style="list-style-type: none"> • Give bolus of IV Colloid (Gelofusine® 249) 500mL; may repeat x 1; follow with Hartmann's solution 240 • Observe closely ¼ hourly <ul style="list-style-type: none"> – blood loss – onset of labour – fetal heart rate – maternal vital signs • urinary output hourly

TRANSFER TO HOSPITAL

**BLEEDING DURING EARLY PREGNANCY
(<20 weeks gestation) (INTERVENTION)**

Always consider the possibility of an ectopic pregnancy in a woman with vaginal bleeding, a positive pregnancy test, and/or abdominal pain

IN ALL CASES

- | | |
|---|--|
| <ul style="list-style-type: none">• Assess general condition and reassure woman• Determine history of bleeding (onset, duration, gestation previous obstetric problems)• Assess blood loss (note colour and number of clots or if it is not clotting)• Assess uterine size (equal to dates), tenderness, uterine rigidity• Establish IV access 206 | <ul style="list-style-type: none">• Monitor abdominal pain<ul style="list-style-type: none">- nature (continuous/intermittent)- location- intensity• Vital signs (every 15 minutes)• Give oxygen at 6 litres/minute only if woman is haemodynamically compromised• Test urine• Place in left lateral position• Nil by mouth |
|---|--|

TRANSFER TO HOSPITAL

ONSET OF LABOUR

KING EDWARD MEMORIAL HOSPITAL Maternal Fetal Assessment Unit (MFAU) 08 9340 2199
or 08 9340 2222 and page 2199 for Triage Midwife

Arrange for transfer/RFDS obstetric team as a matter of urgency

1. Immediate transfer (before birth) improves chance of a satisfactory outcome
2. In-utero transfer should not be attempted if there is a significant risk that birth may occur during transfer

ASSESSMENT AT TERM

History

- Medical, surgical and obstetric
- Risk factors for labour and birth

Maternal condition

- Emotional state
- Temperature, pulse, blood pressure, weight, urinalysis, presence of oedema
- Presence of infection (UTI, Group B Streptococcus, Herpes, MRSA), and blood-borne infection (Hep B & C, HIV, etc)

Fetal condition

- Fetal heart rate
- Fetal movements

Progress of Labour

- Time of onset
- Frequency, duration and strength of uterine contractions
- Presentation, position and station of presenting part
- Cervical dilatation
- Status of membranes (Rupture commonly associated with, but not indicative of, the onset of labour)
- Vaginal loss

PRE-TERM LABOUR (Gestation <37 completed weeks)

As for term assessment with the following exceptions:

- Avoid digital examination unless cord presentation is suspected or as ordered by medical officer
- Speculum examination to be performed only by midwife or medical officer trained in the technique
- Use an aseptic technique
- Avoid touching the cervix with the speculum

Additional care for preterm labour:

- Determine gestation (LMP and ultrasound data if available)
- Inspect vulva for the presence of amniotic fluid
- Consult doctor as matter of urgency regarding the use of tocolytic therapy (eg. Nifedipine, Salbutamol **105 107** to suppress labour)
- Insert IV access **206**

PREPARE FOR EMERGENCY DELIVERY
TRANSFER TO HOSPITAL URGENTLY

FULL OR NEAR TERM LABOUR (Gestation 37- 42 weeks)

ASSESS		
MATERNAL WELLBEING	FETAL WELLBEING	PROGRESS OF LABOUR
<ul style="list-style-type: none"> • Vital signs • Vaginal loss • Bladder distention (may obstruct passage of baby) • Urine for protein and ketones • Hydration • General condition <ul style="list-style-type: none"> - fatigue - response to labour - coping ability 	<ul style="list-style-type: none"> • Fetal heart rate <ul style="list-style-type: none"> - normal 120-160/minute • Amniotic fluid for meconium (one sign of fetal distress) • Fetal movement 	<ul style="list-style-type: none"> • Contractions increasing in strength, frequency and duration • Cervical dilation • Maternal behaviour changes indicating impending birth <ul style="list-style-type: none"> - desire to 'push' • Show of blood or mucous
PREPARE FOR EMERGENCY BIRTH		
TRANSFER TO HOSPITAL		

UMBILICAL CORD PROLAPSE (FOCUSSED ASSESSMENT)

KING EDWARD MEMORIAL HOSPITAL Maternal Fetal Assessment Unit
(MFAU) 08 9340 2199 or 08 9340 2222 and page 2199 for Triage Midwife

- Prolapse of the umbilical cord is an OBSTETRIC EMERGENCY. It occurs after the membranes have ruptured and the cord falls or is washed down through the cervix into the vagina and becomes trapped between the presenting part and the maternal pelvis. As a result the umbilical cord vessels are compressed. Risk factors include:
 - High/ill fitting presenting part
 - Prematurity
 - High parity
 - Malpresentations
 - Polyhydramnios
 - Multiple pregnancy
- Cord prolapse is diagnosed when the cord can be felt below the presenting part - in the cervix, the vagina or visualised at the vulva
- Suspect prolapse in a woman with ruptured membranes and signs of fetal distress, especially if fetal bradycardia (<100 bpm)
- Where predisposing risk factors exist, a vaginal examination should be performed after the membranes rupture or if fetal bradycardia occurs after rupture of membranes.

KEY ASSESSMENT POINTS

- | | |
|--|--|
| <ul style="list-style-type: none"> • Obstetric history <ul style="list-style-type: none"> – parity – previous obstetric history – risk factors for prolapsed cord • Maternal vital signs • Labour status <ul style="list-style-type: none"> – gestation – contractions (frequency, duration, strength) – presentation – cervical dilatation • Membranes - If the membranes are intact, a cord presentation may be detected on vaginal examination | <ul style="list-style-type: none"> • Fetal heart - Normal fetal heart rate is 120-160 beats per minute. Bradycardia, especially after and during contractions, is the most common presenting sign of prolapse. CTG abnormality (bradycardia, severe variable decelerations) are also suggestive of cord prolapse. Death of the fetus, evidenced by absence of heart sounds, is NOT UNCOMMON • Colour of amniotic fluid <ul style="list-style-type: none"> – if blood stained, possibility of ruptured vasa praevia (ruptured fetal blood vessel), or show. This is a rare occurrence (1:2700). Blood stained liquor is just as likely from a placental abruption – if meconium stained, often associated with fetal hypoxia and post term • Emotional status |
|--|--|

UMBILICAL CORD PROLAPSE (INTERVENTION)

IF FETUS IS DEAD	BIRTH IMMINENT AND BABY IS ALIVE
Arrange transfer to hospital and provide emotional support to the woman	Immediate birth is necessary when the fetus is viable, see EMERGENCY BIRTH 108

BIRTH NOT IMMINENT

The goal of interim treatment is to halt labour and keep the presenting part off the cord until birth can be accomplished.

URGENT ACTION

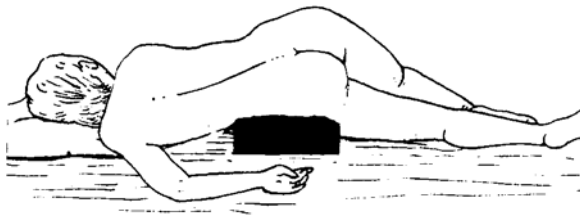
- Provide explanation to the woman and offer comfort.; call for assistance
 - Place woman in the 'knee chest' position or the 'exaggerated Sim's position' - left lateral supported with 2 pillows (see Figures 3 & 4 next page); maintain in position until delivery
 - Wash hands and put on sterile gloves
 - If cord is protruding, GENTLY replace in vagina. If unable to replace, wrap cord in warm wet packs to prevent spasm of vessels
- Do not:**
- attempt to replace the cord in the uterus
 - over-handle cord – it will cause the vessels to spasm
- Push the presenting part out of the pelvis upward by using fingers in the vagina. This will relieve pressure on the cord by the presenting part; continue until delivery is commenced
 - Insert catheter and fill bladder with 350 - 500 mL normal saline to keep presenting part higher in the pelvis
 - Monitor fetal condition

MAINTAIN KNEE CHEST OR EXAGGERATED SIM'S POSITION. **103** TRANSFER TO HOSPITAL URGENTLY.

Figure 3
Knee Chest Position (Bennett and Brown, 1999)



Figure 4
Exaggerated Sim's Position (Bennett and Brown, 1999)



PRETERM LABOUR AND TOCOLYSIS

Adapted with permission Royal Flying Doctor Western Operations, Clinical Guidelines. December, 2003.

Conduct RAPID PRIMARY ASSESSMENT **14** AND INITIAL ASSESSMENT **16** Follow Medical Consultation Flowchart **4**
See ONSET OF LABOUR **99**

- Premature labour is defined as the onset of labour before 37 completed weeks gestation
- This includes women of gestation less than 35 weeks, where adequate paediatric management is not possible outside King Edward Memorial Hospital (KEMH)
- Perinatal morbidity and mortality for low and extremely low birth weight infants is significantly improved by birth and resuscitation in a tertiary centre
- Tocolysis is used to suppress labour and prevent birth on transfer. Postponing birth also enables fetal lung maturation to be accelerated with steroids. There is good evidence not to employ tocolysis for longer than 48 hours, or for gestations greater than 34 weeks other than to allow transport
- Corticosteroids enhance lung maturation, decrease the risk of neonatal intracerebral haemorrhage and necrotising enterocolitis
- Nifedipine has a similar tocolytic activity to betamimetics such as Salbutamol, but a lower incidence of side effects **280**
Most studies on its use have been for gestation less than 34 weeks and cervical dilatation less than 4cm
- For gestation less than 34 weeks and cervical dilatation less than 4 cm, commence tocolytic therapy
 - consult medical practitioner
 - first line tocolysis Nifedipine **280**
 - second line tocolysis Salbutamol **292**
- Gestation more than 34 weeks or cervical dilatation greater than 4 cm
 - consult medical practitioner
 - first line tocolysis Salbutamol **292**
 - Alternative tocolysis Nifedipine **280**

CONTRAINDICATIONS TO TOCOLYSIS

Absolute contraindications: Fetal death and massive maternal haemorrhage

Relative contraindications: Antepartum haemorrhage, pre-eclampsia, chorioamnionitis and fetal distress.

INHIBITION OF LABOUR WITH TOCOLYTIC THERAPY - NIFEDIPINE (ADALAT®)

PRESENTATION

Tablets 10 mg and 20 mg

PHARMACOLOGY

A selective beta₂-adrenoreceptor stimulant which causes bronchodilation, this calcium channel blocker also relaxes smooth muscle of the uterus and inhibits both prostaglandin and oxytocin induced contractions.

Nifedipine has similar tocolytic activity to betamimetics such as Salbutamol but a lower incidence of maternal side effects. The use of Nifedipine as a tocolytic has demonstrated improved fetal and neonatal outcomes to the use of Salbutamol. Outcomes demonstrated are related to lower rates of respiratory distress syndrome, intracranial haemorrhage and perinatal mortality. There is some evidence that Nifedipine can be used safely for extended periods.

PRIMARY INDICATIONS

- Hypertension
- Preterm labour

The decision to suppress labour with tocolytic medication is to be made on the advice of a medical officer. Decisions to change tocolytic medication should also be made by a medical practitioner.

CONTRAINDICATIONS

- Where conditions exist that contraindicate any suppression of labour including antepartum haemorrhage, pre-eclampsia, chorioamnionitis and fetal distress
- Cardiac disease (cardiac conduction defects and LVF)
- Hypotension
- Concomitant use of betamimetics such as Salbutamol
- Concomitant use of MgSO₄. This is not an absolute contraindication but care must be taken as hypotension may result. A patient being treated with Nifedipine should not be given a bolus of MgSO₄.

EXPECTED ACTION

Action of tocolysis medication is expected between 30 and 60 minutes. Therefore, initiation of alternative tocolysis should not be considered in the first 2 hours. If contractions do not abate after this time, the advising medical practitioner may consider another tocolytic.

PREREQUISITE CARE

- Insert an IV
- Obtain baseline electrolytes, urea and creatine and LFT levels if able

ROUTE OF ADMINISTRATION

- Oral
- Dose
 - Initial dose 20 mg Nifedipine orally (not slow release Nifedipine) **280**
 - If contractions persist after 30 minutes, give another 20 mg oral dose
 - If still contracting after a further 30 minutes (a total of 1 hour post-medication), follow up with a further 20 mg orally
 - If BP is stable, a maintenance dose of 20 mg tds for 48 to 72 hours may be given where indicated while considering a need to transfer

Notes:

- The maximum dose of Nifedipine is 120 mg/day **280**
- After 72 hours, if maintenance therapy is required, patients can be changed over to Adalat Oros® (long acting) 30 to 60 mg orally / day
- In contrast to betamimetics, Nifedipine does not induce tachycardia, so maintenance therapy may be prescribed

OBSERVATIONS

- Half-hourly maternal pulse, BP, respiratory rate, fetal heart and vaginal loss until contractions cease
- Continuous fetal heart rate monitoring is indicated until contractions have settled

SIDE EFFECTS

- Facial flushing
- Headache
- Nausea
- Tachycardia
- Dizziness
- Hypotension - unusual in normotensive patients
- Cardiac failure
- Increase in liver enzymes

MANAGEMENT

Treat maternal hypotension with IV fluids in the first instance.

TRANSFER TO HOSPITAL

REFERENCE

King JF. Flenady V. Papatsonis D. Dekker G. Carbonne B. 2003. Calcium channel blockers for inhibiting preterm labour; a systematic review of the evidence and a protocol for administration of nifedipine. **Australian & New Zealand Journal of Obstetrics & Gynaecology**. 43:3:192-8.

INHIBITION OF LABOUR WITH SALBUTAMOL Adapted with permission from King Edward Memorial Hospital, Evidence Based Obstetric Clinical Guidelines, 2003.

NOTIFY CONSULTANT ON DUTY OR ON CALL BEFORE ANY INFUSION IS COMMENCED.

However, if patient is in active labor (4 cm or more) discuss with medical officer/RFDS tocolysis to use, RFDS to use Salbutamol as first line

SALBUTAMOL INFUSION - CONVERSION CHART

COMMENCE	= 12 mL/hour
	= 16 mL/hour
	= 20 mL/hour
	= 24 mL/hour
MAXIMUM	= 28 mL/hour
	= 32 mL/hour
	= 36 mL/hour

Salbutamol Infusion is commenced at 12 mL/hour and increases by 4 mL/hr every 30 mins until:

- contractions cease, OR
- maternal pulse rate reaches 120 beats/min, OR
- the infusion rate reaches a maximum of 36 mL/hr

OBSERVATIONS	
<p>15-MINUTELY OBSERVATIONS UNTIL A MAINTENANCE LEVEL OF SALBUTAMOL IS ATTAINED</p> <ul style="list-style-type: none"> • Maternal pulse rate • Intravenous infusion rate • Vaginal loss • Assessment of contractions • Fetal heart rate for one hour (if satisfactory, then hourly) 	<p>WHEN MAINTENANCE LEVEL OF SALBUTAMOL REACHED:</p> <ul style="list-style-type: none"> • Hourly: blood pressure, respirations, pulse, fetal heart, contractions • 2-hourly: temperature, empty bladder • 24-hourly: fluid balance, maternal urea and electrolytes <ul style="list-style-type: none"> – fluid restriction to 2,500 mL per 24 hours is necessary for women receiving Salbutamol treatment to decrease the incidence of pulmonary oedema
<p>REPORT TO MEDICAL PRACTITIONER</p>	<ul style="list-style-type: none"> • Maternal pulse rate above 120 beats per minute • Systolic blood pressure 80 to 90mmHg or below • Deviations from normal fetal heart rate (120 to 160 bpm) • Respiration rate 20/minute or greater • If uterine activity continues when intravenous Salbutamol rate has reached MAXIMUM of 36 mL/hour (30 mcg/minute) • Any reaction to Salbutamol (palpitations, tremors, nausea)

EMERGENCY BIRTH (FOCUSSED ASSESSMENT)

KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199 or
08 9340 2222 and page 2199 for Triage Midwife

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS (Recognise imminent birth by the following:)

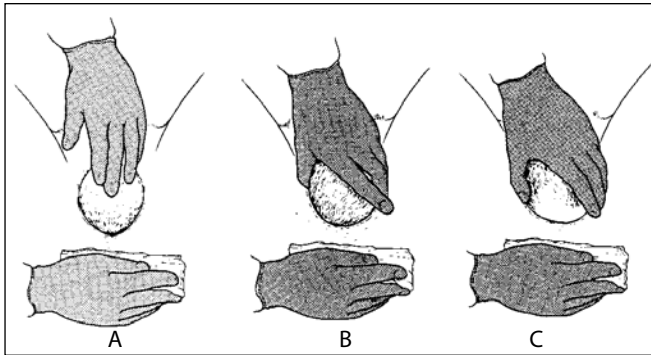
- Uncontrollable urge to push or feeling urge/desire to defecate, accompanied by bulging perineum
- 'Show' of blood and/or mucous
- Presenting part visible at the introitus

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Time of onset of labour • Obstetric history <ul style="list-style-type: none"> – previous obstetric history (number of previous pregnancies, number of live births, type of births, multiple births) – gestation/estimated due date – antenatal care – complications during pregnancy (medical/surgical or obstetric) • Medical history <ul style="list-style-type: none"> – blood group and rhesus factor – bleeding disorders – infections (GBS) 	<ul style="list-style-type: none"> • Vital signs <ul style="list-style-type: none"> – maternal blood pressure, pulse, respirations – fetal heart rate (normally 120-160/minute) • Stage of labour <ul style="list-style-type: none"> – frequency, duration, strength of contractions – abdominal palpation and vaginal examination (by midwife if available) • Status of membranes - intact or ruptured • Colour of liquor (clear, blood stained, meconium stained) • Vaginal loss - amount (if any) and type (eg. blood, liquor) • Urinalysis • Emotional state of woman

EMERGENCY BIRTH (INTERVENTION)

BIRTH IMMINENT (Head on view, hands on approach)	BIRTH IMMINENT (Left lateral, hands-off approach)
<ol style="list-style-type: none"> 1. Position woman kneeling - leaning forward onto a support, eg. bed, bean bag, chair 2. Wash hands, don sterile gloves 3. Aim for a slow, gentle birth <ul style="list-style-type: none"> – Encourage woman to push spontaneously – Allow head to be born slowly, encourage breathing through contractions – Support head with both hands (place a hand over each side of head) – Feel around neck for umbilical cord as soon as possible <ul style="list-style-type: none"> – If the CORD is LOOSE, loop it over the baby's head – If the CORD is TOO TIGHT to loop over the baby's head, clamp the cord twice, cut between the 2 clamps and unwind the cord – Encourage to push and allow external rotation (restitution) of the head – Gently draw head down to release anterior shoulder beneath symphysis pubis (see Figure 6 next page) – Continue to draw baby upwards towards mother (see Figure 7 next page) – When body completely born, place baby prone across mother's abdomen skin-to-skin – Clamp cord twice approximately 10 cm from baby (if you have not done so already) – Cut cord between clamps – apply plastic clamp (2 cms from skin of umbilicus) – IF INSTRUCTED BY A MIDWIFE OR DOCTOR, administer Oxytocin 10 Units IM to woman post-delivery of baby 4. Check woman's blood pressure, pulse, temperature, and blood loss immediately 5. Await delivery of placenta and encourage woman to void 	<ol style="list-style-type: none"> 1. Let the woman adopt an upright position that she feels comfortable in. Do not lie flat as this will induce supine hypotension 2. Left lateral (right leg supported by midwife/nurse) or in an upright leaning forward position allows the diameters of the pelvic outlet to increase 3. Listen to and watch for the woman's instinctive behaviour <ul style="list-style-type: none"> – Encourage the woman to push spontaneously and establish her own rhythm – Supporting the perineum has not been shown to reduce perineal trauma – If the cord is around the baby's neck it will usually slip over the baby's body during birth – Rarely the cord is too tight around the baby's neck, inhibiting the birth. If necessary clamp the cord twice, cut between the 2 clamps and unwind the cord. The baby must be born immediately – Have hands poised in a position to receive the baby – Encourage the woman to continue to push so the baby is born in one contraction phase – When baby is born place prone across mother's abdomen skin-to-skin – Clamp cord twice approximately 10 cm from baby – Cut cord between clamps – apply plastic clamp (2 cms from skin of umbilicus)
<p>PREPARE FOR TRANSFER TO HOSPITAL</p>	

Figure 5 Delivering the head (Bennett and Brown, 1999)



(A) Preventing too rapid extension (B) Controlling the crowning
(C) Ease the perineum to release the face

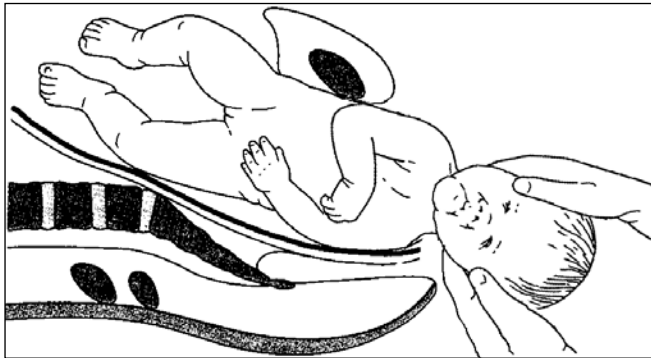


Figure 6 Gentle downward traction is applied to deliver anterior shoulder (Sweet, 1997)



Figure 7 Posterior shoulder delivered and then the trunk by lateral flexion (Sweet, 1997)

DELIVERY OF PLACENTA

NOTE: IF THE PLACENTA IS IN SITU LEAVE FOR DOCTOR/MIDWIFE TO DELIVER

If nurse is NOT A MIDWIFE

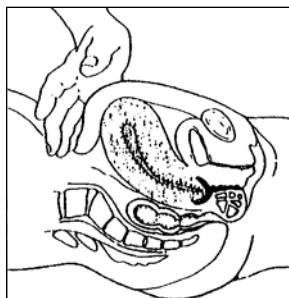
1. Wait for placenta to separate and descend by itself (may take 20 minutes or more). Signs of separation include a 'firming up' of the uterus, a trickle of blood at the introitus and a lengthening of the cord.
2. When placenta is visible at the introitus, gently remove it and place in a kidney dish. Support the uterus with the free hand at the supra pubic area during delivery. Discontinue traction if there is any suggestion of the cord breaking or not progressing with traction.
3. Monitor and record blood loss.

DO NOT DISCARD THE PLACENTA, SEND TO HOSPITAL WITH MOTHER AND BABY
TRANSFER CAN TAKE PLACE WITH PLACENTA IN SITU IF NECESSARY

IMMEDIATELY FOLLOWING DELIVERY OF PLACENTA

- Check fundus and blood loss, once placenta is delivered, at least every 15 minutes for the first hour, then in 1 hour.
 - Fundus should be firm and central at or below the umbilicus (see Figure 8)

Figure 8
Assessing fundus



IMMEDIATE CARE OF THE NEWBORN

KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199 or
08 9340 2222 and page 2199 for Triage Midwife

APGAR SCORING CHART (EVALUATION OF A NEWBORN)

THE APGAR SCORE IS ASSESSED AT 1 MINUTE AND 5 MINUTES AFTER BIRTH.
REPEAT SCORE AT 10 MINUTES IF IT WAS LESS THAN 7 AT 5 MINUTES.

- The baby is rated 0, 1, or 2 for each of the five signs listed in the left-hand column
- The overall score of 0 to 10 is the sum of the ratings of the five individual signs
- Infants with a score of 4 or less need immediate active resuscitation

SIGN	0	1	2
Heart rate	Absent	Slow (below 100)	Over 100
Respiratory effort	Absent	Slow, Irregular	Good, crying
Muscle tone	Flaccid	Some flexion of extremities	Active motion
Reflex irritability	No response	Grimace	Cry
Colour	Blue, pale	Body pink, extremities blue	Completely pink

USING THE APGAR SCORE

SCORE	INTERVENTION
Score 8-10	<ul style="list-style-type: none"> • Give to mother for skin-to-skin contact
Score 4-7	<ul style="list-style-type: none"> • Oral suction 123 • Free flow oxygen or bag-and-mask • Stimulate to gasp
Score 0-3	<ul style="list-style-type: none"> • Oral suction 123 • Initiate bag-and-mask ventilation 123 • Use external cardiac massage if heart rate does not ↑ to 100 beats/minute with adequate ventilation 120

IMMEDIATE CARE OF THE NEWBORN cont...

WHEN BREATHING ESTABLISHED	IF NOT BREATHING	IF NO RESPONSE TO STIMULATION
<ul style="list-style-type: none"> • Identify baby • Monitor temperature and keep warm. Ensure temperature remains above 36.5° C <ul style="list-style-type: none"> – Minimise heat loss by drying carefully, especially the head. – Place on mother's chest (skin-to-skin best way to warm up). – Cover with towel – If necessary use radiant heat or wrap in warm blanket • Monitor newborn's respirations and temperature every 15 minutes if outside normal range: • Note if urine or meconium (bowel motion) is passed • Assist woman to breastfeed within the first hour after birth 	<ul style="list-style-type: none"> • Stimulate • Check heart rate is greater than 100 beats/minute • Gentle oropharyngeal suction if required • Oxygen via bag-and-mask 123 	Commence RESUSCITATION 120
TRANSFER TO HOSPITAL WITH MOTHER		

PRETERM AND LOW-BIRTH-WEIGHT INFANTS

In the absence of the technology for intensive treatment of these infants the PRIORITY IS TRANSFER TO HOSPITAL

Until this is possible: <ul style="list-style-type: none"> • Monitor vital signs, especially respiration and temperature • Keep warm and pink • Give oxygen at a rate to keep mucous membranes pink. 	Check blood sugar by heel prick. Encourage to breastfeed. <ul style="list-style-type: none"> – If < 2.0mmol/litre check again in 20 minutes – If still < 2.0mmol/litre give formula feed by NG tube (Amount of feed calculated according to body weight 60 mL/kg in first 24 hours/number of feeds 2 to 3-hourly)
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POSTPARTUM HAEMORRHAGE (FOCUSSED ASSESSMENT)

KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199
or 08 9340 2222 and page 2199 for Triage Midwife

Primary postpartum haemorrhage is defined as blood loss of 500 mL or more (or if less, an amount that causes deterioration of the woman's condition) within the first 24 hours after birth

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

Determine the cause of the haemorrhage.

1. Consider contributing risk factors/obstetric history
 - Pregnancy complications
 - prolonged or very rapid labour
 - hypertension
 - previous postpartum, antepartum/intrapartum haemorrhage
 - previous retained placenta
 - large baby / large placenta
 - Parity of five or more
 - Multiple pregnancy
 - Bleeding disorder
 - Anaemia

2. Assess the tone of the uterus
Check the uterine fundus

The fundus should be firm, central and at or below the umbilicus.

- Continue to assess whether it remains contracted and does not increase in size or deviate to one side

<p>3. Assess the woman for presence of genital trauma. Examine perineum for lacerations and ascending vaginal tears</p> <p>If the uterus is contracted, perform a digital examination of vagina (or speculum) to exclude lacerated cervix or vaginal wall tears</p>	<p>Blood loss from an EPISIOTOMY or TEAR is approximately 200-300 mL</p> <p>Pack with vaginal pack, record number in situ in notes</p>
<p>4. Assess the likelihood of retained products</p> <ul style="list-style-type: none"> - Check the placenta and membranes 	<p>Is the placenta/membranes complete?</p>
<p>5. Arrange care for infant</p>	<p>Place in care of relatives, if available, for transfer with mother</p>
<p>6. Assess the woman's general condition</p> <ul style="list-style-type: none"> - Vital signs - Skin colour - Level of consciousness - Sweating - Emotional state/anxiety - Dizziness 	<div style="background-color: #800040; color: white; padding: 10px; text-align: center;"> <p>REMEMBER</p> <p>1000 mL of blood can be lost before vital signs are affected</p> </div>
<p>7. Assess bladder status</p> <ul style="list-style-type: none"> - Insert catheter to empty bladder 	<p>Allows the uterus to contract down, promotes separation and delivery of placenta if this has not yet occurred (leave catheter indwelling)</p>
<p>8. Assess extent of blood loss</p> <ul style="list-style-type: none"> - Weigh, measure, estimate and save all blood loss / clots etc - Observe blood to ensure that it clots - Monitor any immediate postpartum bleeding greater than a moderate menstrual period 	

POSTPARTUM HAEMORRHAGE (INTERVENTION)

KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199
or 08 9340 2222 and page 2199 for Triage Midwife

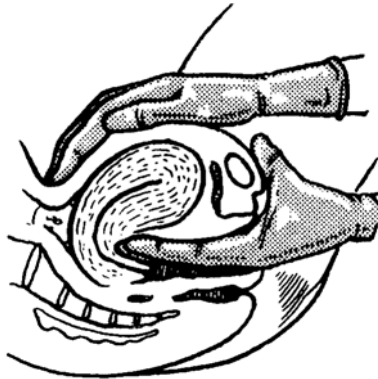
OBSERVATIONS	INITIAL INTERVENTIONS – ALL WOMEN
<ol style="list-style-type: none"> 1. Palpate the fundus (top of uterus) to determine tone/height and monitor vital signs every 15 minutes 2. Check lochia and fundus every 15 minutes 3. Monitor output 4. Measure/estimate and record total blood loss 	<ol style="list-style-type: none"> 1. Establish IV access 206 x 2 (preferably 14 gauge) and commence infusion of Oxytocin 30 Units 283 in 500 mL Hartmann's at 240 mL/hour 240 2. If BP less than 85mmHg systolic give bolus of 500 mL Gelofusine® 249 (may repeat x 1, follow with Hartmann's solution 240) 3. Give oxygen at 6 litres/minute 4. Insert indwelling urinary catheter 5. Fast the woman
SPECIFIC INTERVENTIONS	

IF UTERUS CONTRACTED	IF UTERUS SOFT - NOT WELL CONTRACTED
<ol style="list-style-type: none"> 1. If vaginal or cervical laceration evident, pack the vagina and record number of packs 2. Suture any perineal laceration 	<ol style="list-style-type: none"> 1. Massage uterus. Use side of hand with fingers and thumb straight Use a slow, firm rotary motion with fingers behind fundus and thumb in front 2. If uterus still not contracted with Oxytocin infusion drip and massage fundus, administer Ergometrine 0.25 mg slowly IV 245 Note: Ergometrine is contraindicated in women with hypertension 3. If necessary, use bimanual compression of uterus (internal and external) (see Figure 9 next page) THIS MAY SAVE THE WOMAN'S LIFE
TRANSFER TO HOSPITAL URGENTLY	

BI-MANUAL COMPRESSION OF THE UTERUS

Figure 9 Bi-manual compression of the uterus (Miller and Hanretty, 1997)

The fingers of one hand are pressed into the anterior fornix



If satisfactory pressure IS NOT obtained and vaginal laxity permits, insert the whole fist



PRE-ECLAMPSIA (FOCUSSED ASSESSMENT)

KING EDWARD MEMORIAL HOSPITAL
Maternal Fetal Assessment Unit (MFAU) 08 9340 2199
or 08 9340 2222 and page 2199 for Triage Midwife

Severe pre-eclampsia is characterised by hypertension of equal to or greater than 170/110mmHg and the presence of proteinuria. Together with the above symptoms, seizures, and/or coma indicates the onset of eclampsia.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- | | |
|--|--|
| <ul style="list-style-type: none"> • Level of consciousness 17 • Hyper-reflexia | <ul style="list-style-type: none"> • Seizure/muscle spasm • Dyspnoea/hypoxia |
|--|--|

SUBJECTIVE ASSESSMENT

- Symptoms suggestive of worsening pre-eclampsia.
- Seek help in the event of:
 - persistent headache (frontal)
 - drowsiness
 - visual disturbance (eg. spots before eyes)
 - generalised oedema
 - persistent epigastric pain
 - vomiting
 - altered mental state/confusion

- Contributing factors
 - number of previous pregnancies
 - gestation/estimated due date
 - antenatal history including elevated blood pressure, excessive/rapid weight gain, or oedema (ask a relative if necessary)
 - complications of previous pregnancies
- Medical history
 - hypertension
 - renal disease
 - medications

OBJECTIVE ASSESSMENT

- Vital signs
 - If systolic blood pressure greater than 160mmHg and/or diastolic greater than 100mm/Hg check in 10 minutes if still above these figures action is required
- Generalised oedema, especially peri-orbital
- Urinary output
- Proteinuria
- Dyspnoea
- Onset of labour
 - presence of contractions, rupture of membranes, show
- Fetal heart rate

PRE-ECLAMPSIA (INTERVENTION)

THIS IS A MAJOR MEDICAL EMERGENCY

The aim of care is to maintain the diastolic BP at 80 to 90 mmHg, any lower will cause ACUTE FETAL HYPOXIA

Hydralazine SHOULD NOT be administered with other hypotensive agents, especially Diazoxide
TRANSFER TO HOSPITAL URGENTLY AS DELIVERY IS THE ONLY DEFINITIVE TREATMENT

NO SEIZURES	SEIZURES (ECLAMPSIA)
<ul style="list-style-type: none">• Vital signs<ul style="list-style-type: none">– blood pressure and fetal heart rate every 15 minutes• Place in left lateral position• Establish IV access 206• Insert indwelling catheter, measure output hourly• Test urine for protein• Medication<ul style="list-style-type: none">– If diastolic BP \geq 110mmHg, Nifedipine 20 mg orally. 280 If medical officer present administer Hydralazine 5 mg slowly IV over 10 minutes, give 5 mg increments as necessary to maintain the diastolic blood pressure between 90 to 95mmHg 258– if woman complaining of severe headache, blurring of vision, epigastric pain or has hyperactive nervous responses, consider anti-convulsant prophylaxis• Observe for onset of labour 99• Nil by mouth	<p>In addition to intervention for NO SEIZURES section:</p> <ul style="list-style-type: none">• Maintain airway, suction as necessary• Protect woman from injury, do not restrain• The decision to commence prophylactic treatment with Magnesium Sulphate, outside the hospital setting, needs to be made bearing in mind both the risks associated with an eclamptic fit versus the risks associated with the inadvertent overdose of the drug. This decision is to be made by the medical practitioner. <p>See SEIZURES 165</p>

RESUSCITATION OF THE NEWBORN

Adapted from *Stabilisation and Transport of Newborn Infants and At-risk Pregnancies*, Western Australian Neonatal Transport Service (WANTS), Perth 2002.
(Available from Princess Margaret Hospital)

WANTS

Western Australian Neonatal Transport Service
Tel: 08 9340 8448 Fax: 08 9340 8037

VENTILATION (WHETHER MASK OR ENDOTRACHEAL TUBE) IS THE SINGLE MOST IMPORTANT INTERVENTION IN NEONATAL RESUSCITATION

The extent to which these treatments can be carried out in the remote community will depend on the experience of the Remote Area Nurse and the equipment/supplies available. As with all other situations, as the Remote Area Nurse, you should undertake only those activities for which you feel competent.

GUIDE TO APPROPRIATE LEVEL OF RESUSCITATION

NEWBORN CONDITION SHOULD BE USED AS THE FIRST INDICATION FOR RESUSCITATION.

The APGAR score may also be used as a further guide to the appropriate level of resuscitation.

REMEMBER that you **DO NOT WAIT** until the 1-minute APGAR score is taken before undertaking resuscitation
IMMEDIATE assessment and action is required.

NORMAL NEWBORN

These infants are quickly PINK and require minimal interference.

PRESENTATION	INTERVENTION
<ul style="list-style-type: none"> • APGAR 8 to 10 at 1 minute 	<ul style="list-style-type: none"> • Dry skin immediately and give to mother for skin-to-skin contact • Cover with warm wraps • Lie on side if excessive mucous present

MODERATELY DEPRESSED NEWBORN

In general these infants respond to relatively simple methods of resuscitation.

PRESENTATION	INTERVENTION
<ul style="list-style-type: none">• APGAR 4 to 7 at 1 minute• Primary apnoea• Adequate circulation• Infant is BLUE	<ul style="list-style-type: none">• Keep warm• Gentle suction of mouth and oropharynx• Cutaneous stimulation, (eg. drying of infant)• Intranasal oxygen at 1-2 litres/minute• May require bag-and-mask ventilation if no respiratory effort (AIRWAY MANAGEMENT) 123• If appropriate (ie. if mother received narcotic within 4 hours before birth) administer Naloxone 0.1 mg/kg IM 278 125 (FIRST ENSURE MOTHER NOT OPIATE DEPENDENT OR ON METHADONE)

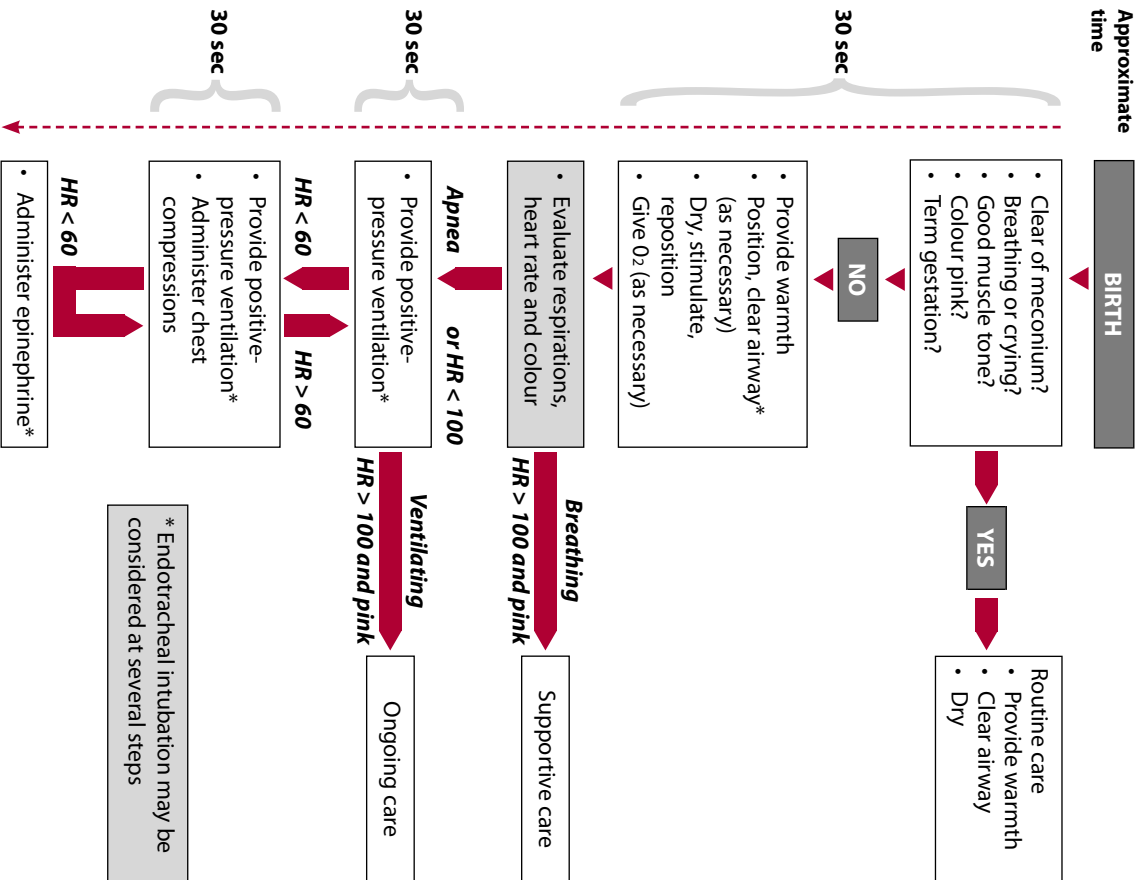
SEVERELY DEPRESSED NEWBORN

These infants all need vigorous and immediate resuscitation.

PRESENTATION	INTERVENTION
<ul style="list-style-type: none">• APGAR 0 to 3 at 1 minute• Secondary apnoea• Depressed circulation• Infant is GREY or WHITE• Flaccid	<ul style="list-style-type: none">• Follow RESUSCITATION ALGORITHM in Figure 10 next page• See CPR for external cardiac compression 124• Bag-and-mask ventilation with oxygen at 6 litres/minute (AIRWAY MANAGEMENT) 123• Volume expansion if indicated (only if IV access and competent staff available)• ONCE RESPIRATIONS AND CIRCULATION ARE ADEQUATE a DOCTOR may administer:<ul style="list-style-type: none">– Adrenaline 1 in 10,000, 0.3 mL/kg, by umbilical vein, endotracheal tube or intra-cardiac 230

IF NO RESPONSE AFTER 20 MINUTES DISCONTINUE.

Figure 10. Algorithm for resuscitation of the newly born infant.



TEMPERATURE CONTROL

- An area with a radiant heat source is required away from draughts and open doors
- To prevent evaporative heat loss, the infant should immediately be dried and the wet cloth discarded
- The infant is then covered with a dry, warm wrap (unless using a radiant heater and then the skin should be exposed)

AIRWAY MANAGEMENT

- Suction is NOT required as a routine. It is used if blood or meconium are present in the pharynx (See notes on SUCTIONING next page)
- An oropharyngeal airway is not usually necessary, even with bag-and-mask ventilation, but may OCCASIONALLY improve gas delivery

EFFECTIVE BAG-AND-MASK VENTILATION

- All midwifery, nursing and medical staff must be proficient with this technique
 - Place infant in supine position (head in 'sniff' position) to ventilate with bag-and-mask
 - Ventilate with room air or oxygen at 6 litres/minute
 - Pull the jaw forward and support the mandible against the face mask (cover mouth and nose). Do not hyperextend the head
 - Ventilate at a rate of 30 to 40 breaths per minute
 - Watch for chest movement and listen to breath sounds in each axilla to ensure that ventilation is effective
 - Observe for increases in pulse rate and improvement in colour (pink) due to ventilation
 - ENDOTRACHEAL TUBE AND BAG. (Only use this technique if you are proficient in neonatal intubation)

CARDIOPULMONARY RESUSCITATION (CPR)

Cardiac compression must be started if the heart rate is less than 60 to 80 bpm and has not increased after inflation breaths.

Airway	<ul style="list-style-type: none"> Neutral head position (perhaps finger in pistol grip position for jaw support) (AIRWAY MANAGEMENT 123)
Breathing	<ul style="list-style-type: none"> 1 breath/ventilation every 2 seconds (bag-and-mask) 30 to 40 puffs/minute (AIRWAY MANAGEMENT 123)
Circulation	<ul style="list-style-type: none"> Encircle the chest with both hands so that the fingers lie behind the infant and the thumbs are opposed over the mid-sternum (one finger breadth below the inter-nipple line) ⁽¹⁾ Take great care not to leave the midline (danger of fractured ribs) Alternate compressions with breaths at 3:1 ratio. Try to achieve 90 compressions and 30 breaths per minute (120 events per minute) Depth of compression 2 cm or 1/3rd depth of the chest for preterm babies
1 or 2 operators	<ul style="list-style-type: none"> 3 compressions: 1 breath 30 cycles/minute

Continue until heart rate exceeds 100/minute or for at least 20 minutes.
If no apex beat or respiratory effort after 20 minutes DISCONTINUE.

1. Martin, C. and Butler, J. 2004. Two thumb compared with two finger cardiopulmonary resuscitation in infants. Emerg Med J, 21:711-713.

NOTES ON SUCTIONING

- When there is meconium in the liquor, the oropharynx should be suctioned as soon as the head is delivered, BEFORE THE BIRTH OF THE BODY (ie. before the baby can gasp)
- After birth and UNDER DIRECT VISION further thorough suctioning of the oropharynx and nasopharynx should be performed

NOTES ON NARCOTIC ANTAGONIST (NALOXONE) See also 278

Indications for Use

If the mother has had:

- narcotic analgesia within 4 hours of birth, or if
- multiple doses of narcotic analgesia, even if the last dose has been > 4 hours prior to birth.

Contraindications

Withhold Naloxone if the mother is opiate dependent or on Methadone. The baby may go into withdrawal 278

Dose

Naloxone 0.1 mg/kg may be required. May be re-administered until there is a response. Higher doses of Naloxone have been shown to be safe and can prevent secondary apnoea 2 to 4 hours after the initial dose. 278

Route

Access to the umbilical vein may be by needle (best to use a 21 or 23 gauge butterfly needle with an extension, so that syringes can be changed) or umbilical venous catheter (all medical staff should be familiar with this technique).

No Response

Defined as no assessable improvement in heart rate, perfusion, colour or spontaneous respiration. In practice, if there has been NO GASP BY 20 MINUTES (provided there is no respiratory depression from narcotics or hyperventilation) then the outlook is poor, either from death or severe morbidity. The discontinuation of resuscitative efforts should be considered.

Follow-up Care and Observation

Infants who have been severely depressed may have very high rates of complications, respiratory failure, cerebral oedema and convulsions, metabolic derangements and other organ failure. These infants all require transfer to a special care nursery for observation, or at the very least a neurological follow-up.

PAEDIATRIC ASSESSMENT OF THE ACUTELY ILL CHILD

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

MOST COMMON SIGNS OF SERIOUS ILLNESS IN A CHILD UNDER THE AGE OF SIX MONTHS

- Decreased ability to feed
- Difficulty in breathing
- Decreased responsiveness and activity
- Passing less urine
- Cold hands and legs, mottling (poor circulation - late sign)
- Cry high-pitched / weak

FOCUSSED ASSESSMENT OF THE SICK CHILD

These are the KEY SIGNS to consider in all initial visual assessments.

- | | |
|--|--|
| <ul style="list-style-type: none"> • Skin colour <ul style="list-style-type: none"> – Is the skin pale, ashen, cyanosed, or mottled? • Breathing pattern <ul style="list-style-type: none"> – Are respirations grunting or shallow? – Is the rate increased? – Is there an inspiratory/expiratory wheeze or stridor – Is there any accessory muscle use (eg. rib retraction or tracheal tug)? | <ul style="list-style-type: none"> • Sound of cry <ul style="list-style-type: none"> – Is it high-pitched, frantic or weak? • Level of activity <ul style="list-style-type: none"> – Is the child alert or lethargic? • General appearance <ul style="list-style-type: none"> – Does the child look sick? |
|--|--|

SUBJECTIVE ASSESSMENT OF THE SICK CHILD	OBJECTIVE ASSESSMENT OF THE SICK CHILD
<ul style="list-style-type: none"> • History of presenting condition <ul style="list-style-type: none"> – time of onset – decreasing responsiveness and activity – complaints or indications of pain, such as tugging at the ear – appetite and recent nutritional intake, or ability to feed – any vomiting, diarrhoea, or convulsions • Associated information <ul style="list-style-type: none"> – home interventions – time and dosage of medication – response to intervention measures – sick siblings or playmates – housing sanitation - eg. broken toilet or dirty water supply • Past medical history <ul style="list-style-type: none"> – previous illness – known allergies – medications, immunisation status and past reactions, (recent injections) • At particular risk are <ul style="list-style-type: none"> – low-birth-weight babies – premature babies – children with developmental delay – pre-existing medical problems – previous abuse or neglect – malnourished children 	<ul style="list-style-type: none"> • Vital signs 129 <ul style="list-style-type: none"> – temperature – pulse – respiration in all children (rate and effort, nasal flaring, intercostal or sternal retraction or use of accessory muscles should be assessed) – capillary refill (it should be around 2 seconds or less, at normal environmental temperature) – blood pressure in those who are acutely ill <div style="background-color: #c00000; color: white; padding: 5px; text-align: center;">(Beware, hypotension is a late sign in hypovolaemia)</div> • Skin colour and temperature • Weigh all children (all babies under 12 months should be bare weighed) • Examine child for: <ul style="list-style-type: none"> – obvious masses and/or injuries – sites of possible or obvious pain • Mental status and level of activity 19 <ul style="list-style-type: none"> – assess using AVPU chart 17 – alertness <ul style="list-style-type: none"> – older child (response to questions) – if infant (response to environment and stimulus) – listlessness (flaccid)

GUIDELINES FOR MANAGEMENT OF ACUTE DIARRHOEA IN CHILDREN

Adapted with permission from Management Guidelines, Emergency Department, Princess Margaret Hospital for Children

Diarrhoea is defined as an increase in the frequency, fluidity and volume of the stools. The most important problem associated with diarrhoea in childhood is dehydration, this being the leading cause of death amongst children worldwide.

NB: Vomiting alone should not be diagnosed as gastroenteritis

Table 1. Acute Diarrhoea (± vomiting) in Infants and Children

Enteric Infection	Rotavirus Adenovirus Astro virus	Most common causes
<i>Viral</i>		
<i>Bacteria</i>	Salmonella Campylobacter E. coli Shigella Vibrio cholerae	
<i>Protozoa</i>	Giardia Cryptosporidium Entamoeba	
Food Poisoning	Several bacteria and bacterial toxins	
Systemic Infection	UTI, pneumonia, septicaemia, Otitis media	
Surgical Infections	Appendicitis, intussusception Partial bowel obstruction	
Other	Diabetes mellitus, antibiotic associated diarrhoea, Haemolytic uraemic syndrome, congenital adrenal hyperplasia	

FEATURES SUGGESTIVE OF A DIAGNOSIS OTHER THAN VIRAL GASTROENTERITIS

- Abdominal pain with significant tenderness / distension / mass / guarding
- Hepatomegaly
- Vomiting of blood or bile
- Bloody diarrhoea
- Pallor, jaundice
- Systemically unwell out of proportion to the degree of dehydration
- Shock **170**
- Neonate with diarrhoea

VITAL SIGNS

Approximate Normal Values By Age

AGE	PULSE	RESPIRATIONS	BLOOD PRESSURE (50 th percentile)
			It is important to remember that normal blood pressure in children DOES NOT rule out SEVERE hypovolaemia. Children are good at maintaining their BP despite low circulating volumes.
Newborn	120-160	40-60	65-72/55
1 year	80-140	30-40	90/55
3 years	80-120	25-30	93/55
5 years	70-115	20-25	95/57
7 years	70-115	20-25	97/58
10 years	70-115	15-20	103/64
15 years	70-90	15-20	110/64

ASSESSMENT OF SEVERITY OF DEHYDRATION

NO DEHYDRATION (<3% weight loss)	MILD-MODERATE DEHYDRATION (3-8% weight loss)	SEVERE DEHYDRATION (≥9% weight loss)
No signs	<ul style="list-style-type: none"> • Dry mucous membranes (be wary in the mouth breather) • Reduced urine output • Sunken eyes (and minimal or no tears) • Diminished skin turgor (pinch test 1 to 2 sec)# • Altered neurological status (drowsiness, irritability) • Deep (acidotic) breathing 	<ul style="list-style-type: none"> • Increasingly marked signs from the mild-moderate group, plus • Decreased peripheral perfusion (cool/mottled/pale peripheries, capillary refill time > 2 sec) • Anuria • Hypotension • Circulatory collapse

* Signs are ordered in each column by increasing severity

** If an accurate pre-illness weight is available, calculate deficit from weight loss

Pinch test: Pinch skin of abdomen. Skin recoils instantly = normal, 1 to 2 sec = mild-moderate dehydration, >2 sec = severe dehydration

TREATMENT OF DEHYDRATION

The aims of treatment are:

- restoration and maintenance of fluid and electrolyte balance
- replacement of ongoing losses (diarrhoea, vomiting)
- restoration of normal nutrition

Calculation of **Maintenance** fluid requirements

- 100 mL/kg per 24 hours for the first 10 kg of body weight
- Add 50 mL/kg per 24 hours for the next 10 kg of body weight
- Add 20 mL/kg per 24 hours for the remaining kg of body weight

Example: 22 kg child has maintenance requirements of
 $(100 \text{ mL} \times 10) + (50 \text{ mL} \times 10) + (20 \text{ mL} \times 2)$
 $= 1540 \text{ mL}/24 \text{ hours}$

Estimation of **Rehydration** (deficit) volume

This is based on the estimated percentage dehydration

$\% \text{ dehydration} \times \text{body weight (kg)} \times 10$

Example: 22 kg child is thought to be 5% dehydrated
 Rehydration volume is: $5\% \times 22 \text{ kg} \times 10 = 1100 \text{ mL}$

Note: In the case of a shocked child, once circulating volume has been corrected, dehydration is then assumed to be a maximum of 10%, resulting in a maximum rehydration volume of 100 mL/kg.

Recommended composition of Oral Rehydration Solution (ORS) (mmol/L)

Sodium	60
Chloride	60
Potassium	20
Glucose	40
Citrate	10

Note: Sports drinks (eg. *Powerade*, *Gatorade*) are not a suitable substitute for ORS

Children with gastroenteritis should not be given drinks with a high sugar content (eg. fruit juice, lemonade or cola), since this will create an osmotic effect which will worsen the diarrhoea.

GENERAL PAEDIATRIC EMERGENCIES

LIAISE WITH REFERRAL HOSPITAL AS SOON AS POSSIBLE

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SEVERE DEHYDRATION or SHOCK

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> Decreased urinary output. Check number of nappies used or trips to toilet. Weigh nappies or assess how wet they are compared to normal. (Normal output is 1 to 2 mL/kg/day, although most children will make more than this.) Lack of tears Dry mucous membranes, sunken eyes Reduced skin turgor Sunken fontanelles in infants Limp, cold, drowsy infant with mottled limbs Has the child lost weight? Tachycardia. See Vital Signs 129 	<ul style="list-style-type: none"> Give oxygen (as needed to maintain oxygenation) Mild dehydration – commence an oral fluid trial if tolerated Moderate dehydration – commence oral, NG or IV fluids Severe dehydration – commence IV hydration Establish IV access or insert an intraosseous infusion 205 If shocked, give 20 mL/kg Normal Saline 296 or Gelofusine® stat 249 (this may need to be repeated)
TRANSFER TO HOSPITAL	

DEGREES OF DEHYDRATION

PERCENTAGE OF DEHYDRATION	SIGNS AND SYMPTOMS
< 5%	<ul style="list-style-type: none"> History consistent with dehydration No signs of dehydration
6 – 10%	<ul style="list-style-type: none"> Signs of dehydration Not shocked
10%	<ul style="list-style-type: none"> Signs of dehydration Shocked 170 <p>(eg. Pale or mottled, capillary refill > 2secs, reduced level of consciousness)</p>

MENINGOCOCCAL DISEASE

SIGNS AND SYMPTOMS (bacterial)	INTERVENTION
<ul style="list-style-type: none"> • +/- petechial rash (small pink spots or blotches that do not blanch) • Septicaemia - pallor and fever without other obvious cause • Meningitis (young children) <ul style="list-style-type: none"> – vomiting – cerebral irritation – bulging fontanelle – convulsions/fits (these can be quite subtle) • Meningitis (older children) <ul style="list-style-type: none"> – headache – photophobia – fever – neck stiffness (pain on flexion) – positive Kernig's sign (Lie child on back, bend knee as you lift their leg, then straighten the leg. Pain in the child's neck as you do this indicates a positive Kernig's sign.) 	<ul style="list-style-type: none"> • Monitor vital signs and neurological observations closely • Nurse in quiet place until transfer • Establish IV access, if possible 206 <ul style="list-style-type: none"> – if shocked give 20 mL/kg Normal Saline stat 296 – this may need to be repeated if no improvement of clinical signs • Give oxygen (as needed to maintain oxygenation) • Commence drug therapy urgently <ul style="list-style-type: none"> – Ceftriaxone 50 mg/kg IV/IM daily 238 (may be diluted with Lignocaine 0.5% when given IM) 268
TRANSFER IS MORE IMPORTANT THAN IV ACCESS	
TRANSFER TO HOSPITAL	

INTUSSUSCEPTION

Adapted from: Hay, W. et al. (1995). Current Paediatric Diagnosis & Treatment. 12th Edition. Lange Medical.
Reviewed November 2004.

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Often very pale with attacks of pain • Sudden onset of periodic abdominal pain and screaming • In RARE CASES the onset may be painless or with diarrhoea • Vomiting • Sweating and fever • Distended abdomen • Sausage-shaped mass in upper abdomen • Rectal passage of bloody mucous and stool (a late sign) • Some children may have altered conscious state (particularly lethargy) between spasms of pain or secondary to hypovolaemia 	<ul style="list-style-type: none"> • The child needs to be seen by a doctor immediately • Arrange transfer immediately to a hospital with paediatric radiology and surgical service • Establish IV access or intraosseus cannula 206 • Give fluids if required: <ul style="list-style-type: none"> - if shocked – give 20 mL/kg (repeat once if required) 170 - if not shocked – commence maintenance fluids • Analgesia as per ANALGESIA REGIMEN 227
TRANSFER TO HOSPITAL	

PYLORIC STENOSIS

Adapted from: Hay, W. et al. (1995). Current Paediatric Diagnosis & Treatment. 12th Edition. Lange Medical.
Reviewed November 2004.

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Vomiting in a 2 to 6 week old baby. (Can start at birth or occur at other ages. Usually projectile after feeding, intensity of vomiting tends to be worse with time) • Vomitus may be blood-stained • Constipation • Hungry infant • Failure to thrive • Poor weight gain or weight loss • Dehydration • Palpable olive-sized mass in the right upper quadrant (not always felt) • Upper abdomen may be distended after feeding (prominent gastric peristalsic waves can be seen from left to right) 	<ul style="list-style-type: none"> • The baby needs surgery (pyloromyotomy) • Establish IV access 206 • Give fluids if required: <ul style="list-style-type: none"> - if shocked – give 20 mL/ kg (repeat once if required) 170 - if not shocked – commence maintenance fluids
TRANSFER TO HOSPITAL	

PAEDIATRIC RESPIRATORY DISTRESS (GENERAL)

LIAISE WITH REFERRAL HOSPITAL AS SOON AS POSSIBLE

BEWARE THE SILENT CHEST

(ie. No wheeze or stridor MAY indicate insufficient movement of air in and out)
ALWAYS CONSIDER a foreign body lodged in larynx or bronchus (Take relevant history)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

URGENT ACTION

- Sit the child up or leave in preferred position
- Keep child calm, eg. nursed by mother
- Give oxygen via face mask at 6 litres/minute (more as needed)
- Check vital signs and weight
- Do not carry out interventions that upset the child unless unavoidable

FOCUSSED ASSESSMENT

NON-SPECIFIC SYMPTOMS	SPECIFIC SYMPTOMS
<ul style="list-style-type: none">• Decreased activity• Vomiting, anorexia• Fever	<ul style="list-style-type: none">• Bilateral nasal flaring• Tachycardia• Air hunger• Tachypnoea• Use of accessory muscles (rib recession, tracheal or sternal tug)• Wheeze (high-pitched whistle on expiration)• Stridor (barking noise in the upper throat with each inspiration)• Grunting (a sign of distress in infants)

CROUP AND EPIGLOTTITIS

DIFFERENTIAL DIAGNOSIS

SIGNS AND SYMPTOMS, or CIRCUMSTANCES	CROUP (common)	EPIGLOTTITIS (rare)
Age	6 months to 3 years	Any age (peak 2 to 5 years)
Season	Autumn-winter	None specific
Time of day	Night-early morning	Throughout the day
Type of infection	Viral	Haemophilus Influenzae
Onset	Insidious (sometimes rapid)	Rapid (hours)
Upper respiratory tract infection	Yes	Rare
Toxic	No	Yes and often pale
Sore throat	Variable	Yes
Drooling	No	Yes
Stridor	On inspiration	On inspiration
Positions	Variable	Sitting
Cough	Bark like	None (or little)

**AN EASY WAY TO DISTINGUISH MILD FROM MODERATE-SEVERE CROUP
IS THE PRESENCE OR ABSENCE OF RESPIRATORY DISTRESS AND/OR STRIDOR AT REST**
Children with moderate to severe croup will have respiratory distress and/or stridor at rest

MILD CROUP

Maintain a calm environment
(If you get distressed so will the child and this may lead to deterioration)

INTERVENTION

- Reassurance
- Admit if stridor at rest (usually after Dexamethosone) **241**
- Otherwise home with reassurance (usually after Dexamethosone) **241**

MODERATE TO SEVERE CROUP

Will have STRIDOR AT REST or RESPIRATORY DISTRESS
Maintain a calm environment
(If you get distressed so will the child and this may lead to deterioration)

INTERVENTION

- Do vital signs as tolerated
- Position child comfortably
- Give oxygen
- Give Dexamethosone 0.15 mg/kg orally or IM, **241** (If Dexamethosone unavailable give Prednisolone 1-2 mg/kg)
- If unresponsive to Dexamethosone, or for transport, may need nebulised Adrenaline. Get doctor's orders (likely to give only temporary relief)

Adrenaline nebuliser may be useful as a temporary strategy for evacuation or in moderate/severe cases where you have given Dexamethosone and you are waiting for it to take effect **230**

EPIGLOTTITIS

GET DOCTOR'S HELP AS SOON AS POSSIBLE
 DO NOT EXAMINE THE THROAT (THIS MAY LEAD TO RESPIRATORY ARREST)
 Any activity that distresses the child may produce complete obstruction.

Try to keep the child as calm as possible, and confer with a doctor before any activity that will upset them,
 eg. injections, insertion of IV lines etc

If the child is HIB IMMUNISED then it is rare that they will have epiglottitis.

SIGNS AND SYMPTOMS	INTERVENTION
As noted in differential diagnosis on page 136	<ul style="list-style-type: none"> • Sit child on parent's knee • Observe child continuously - note respirations • If condition deteriorates, (ie. increasing stridor, shortening of breath): <ul style="list-style-type: none"> – give oxygen – prepare for emergency Cricothyroidotomy 207 • If delay in evacuation is expected give IM or IV antibiotics (Ceftriaxone 50 mg/kg) 238 • If very long delay, start IV and maintain as per age and size (routine IV fluid for age, usually 2.5% Dextrose, 0.5% Normal Saline)
TRANSFER TO HOSPITAL	

PNEUMONIA

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none">• Non-specific signs and symptoms• Including:<ul style="list-style-type: none">– fever– vomiting– lethargy– tachypnoea– cough	<ul style="list-style-type: none">• Give oxygen (or as needed to maintain oxygenation)• IV line or intraosseus cannula + fluids if signs of DEHYDRATION 206 130• Antibiotics in consultation with doctor
TRANSFER TO HOSPITAL	

BRONCHIOLITIS

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none">• YOUNG CHILD usually LESS THAN 1 YEAR• Non-specific signs and symptoms including:<ul style="list-style-type: none">– fever– vomiting– lethargy– cough– wheeze– nasal flaring– grunting– nasal discharge– tachypnoea	<ul style="list-style-type: none">• Give oxygen (or as needed to maintain oxygenation)• IV line + fluids if signs of DEHYDRATION 206 130• Antibiotics in consultation with doctor
TRANSFER TO HOSPITAL	

PAEDIATRIC ASTHMA

LIAISE WITH REFERRAL HOSPITAL AS SOON AS POSSIBLE

An oxygen saturation of 93% or lower indicates a high likelihood that the child will be admitted to hospital

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**

Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

FOCUSSED ASSESSMENT	SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Duration and nature of symptoms • Treatment given • Relevant trigger factors 	<ul style="list-style-type: none"> • Recent illness, especially upper respiratory tract infection • Medical history <ul style="list-style-type: none"> – previous asthma attacks – known trigger factors – current medication and time of last administration • If no history of asthma, consider other causes of symptoms, eg. foreign body • Fatigue 	<ul style="list-style-type: none"> • Respiration: 129 <ul style="list-style-type: none"> – rate – use of accessory muscles (may be subtle, obvious or maximal nasal flare) • Auscultation: <ul style="list-style-type: none"> – wheeze on expiration (with or without a stethoscope) <p style="text-align: center;">IN ADVANCED STAGES WHEEZE MAY NOT BE HEARD</p> • Especially note gross asymmetry in the loudness of the breath sounds or generalised marked decrease in their loudness (SILENT CHEST) • Mental status • Skin colour (cyanosed or mottled) • Oxygen saturation if available • Peak expiratory flow rate (Young children and children with severe asthma may not be able to do this)

MILD ASTHMA

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> A child who is not distressed may have: <ul style="list-style-type: none"> – slight or no wheeze – subtle or no use of accessory muscles 	<ul style="list-style-type: none"> Salbutamol nebuliser 292 <ul style="list-style-type: none"> – 1 x 2.5 mg pre-packed nebule or MDI (use 5 mg nebule in older children) or 0.1 mg/kg – administer via a spacer – repeat as necessary Vital signs half-hourly PEFR if child is old enough and well enough to cooperate May require steroids (doctor will order) Children who require more than one nebuliser should be treated as MODERATE
CONSULT DOCTOR	

MODERATE ASTHMA

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> A distressed child Obvious wheeze Tachypnoea Tachycardia Obvious to maximum use of accessory muscles 	<ul style="list-style-type: none"> Salbutamol nebuliser 292 <ul style="list-style-type: none"> – 1 x 2.5 mg pre-packed nebule or MDI (use 5 mg nebule in older children) or 0.1 mg/kg – administer via a spacer or with oxygen at 6 litres/minute – give 3 x nebulisers in 1 hour (every 20 mins) – assess after each nebuliser Vital signs quarter hourly PEFR if child is old enough and well enough to cooperate Oxygen if required between MDI or nebuliser to keep saturation in the mid-90% range Prednisolone 1 to 2 mg/kg (estimate weight) orally (60 mg max/day)
TRANSFER TO HOSPITAL	

SEVERE ASTHMA

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • A child in marked distress (unable to walk or talk) • Tachycardia (rate may slow with hypoxia) • Tachypnoea • Marked reduction in volume of breath sounds • Maximum use of accessory muscles or exhaustion 	<ul style="list-style-type: none"> • Continuous Salbutamol nebuliser 292 <ul style="list-style-type: none"> – 1 x 2.5 mg pre-packed nebule (use 5 mg nebule in older children) or 0.1 mg/kg – administer with oxygen at 6 litres/minute • Establish IV or intraosseus cannula access 206 • Vital signs every 15 minutes • Steroids: <ul style="list-style-type: none"> – Hydrocortisone 5 mg/kg IV 259 – Dexamethosone 0.4 mg/kg IM/IV 241 • Consider nebulised Ipratropium (Atrovent)

Any child requiring continuous nebulisers will require ICU management
 TRANSFER TO HOSPITAL AS QUICKLY AS POSSIBLE

PAEDIATRIC SEIZURES

LIAISE WITH REFERRAL HOSPITAL AS SOON AS POSSIBLE

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

INTERVENTION IN ALL CASES

- | | |
|---|---|
| <ul style="list-style-type: none"> • Place the child in left lateral position • Support airway with chin lift. DO NOT force airway or any other object into mouth • Suction secretions and vomitus as necessary • Protect from injury • Administer oxygen during seizure • Observe seizure, and note: <ul style="list-style-type: none"> – time of onset, limb movement, eye deviation and direction, skin colour and level of consciousness, time of cessation | <ul style="list-style-type: none"> • Take rectal temperature • If seizure prolonged beyond 5 minutes give <ul style="list-style-type: none"> – Diazepam 0.2 - 0.4 mg/kg IV or per rectum (repeat after 5 minutes if no response) 243 – rectal Diazepam may be given using a 1 mL syringe (It is also available in a pre-mixed format for easy insertion) • Consider possibility of meningitis (see MENINGOCOCCAL DISEASE 133) |
|---|---|

TRANSFER TO HOSPITAL

FEBRILE SEIZURE (INTERVENTION)

- Observe carefully for cyanosis, hypoxia, injury etc.
- Vital signs every 15 minutes
- Take rectal temperature hourly
- Check blood sugar level (with Glucometer if available)
- Collect urine sample if possible, test
- Administer Paracetamol suppository rectally **285**
 - 125 mg for child under 2 years
 - 250 mg for child 2 to 4 years

NON-FEBRILE SEIZURE (INTERVENTION)

- Observe carefully until child is awake and orientated
- Get history from parents:
 - Has the child fitted before?
 - Is poisoning possible?
 - number of fits in past
 - family history
 - current medication
- Serial vital signs
- Check blood sugar level (with Glucometer if available)

POISONING (FOCUSED ASSESSMENT)

CONTACT POISONS INFORMATION CENTRE

13 11 26 (24 hours)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SUSPECT OVERDOSE/POISON IN ALL

- Unconscious patients
- Patients with unexpected decrease in level of consciousness
- Unusual presentations

CONSIDER ALCOHOL INTOXICATION**KEY ASSESSMENT POINTS**

- Respiratory status
- Level of consciousness **17**
- Behavioural state
 - withdrawn
 - agitated
 - combative

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Description of incident <ul style="list-style-type: none"> – quantity and name of substances ingested – time since ingestion – vomiting since ingestion – home remedies • Reason for ingestion <ul style="list-style-type: none"> – accident – suicidal – recreational – occupational (eg. organophosphate, lead) • Interview family and/or witness • Associated symptoms <ul style="list-style-type: none"> – abdominal pain – nausea, vomiting, diarrhoea, haematemesis – dysphagia – drowsiness or restlessness – drooling, salivation – palpitations – dry mouth – dyspnoea, cough – hallucinations, visual disturbances/photophobia – seizures • Past history <ul style="list-style-type: none"> – physical and psychosocial history – current medications and recreational drug use – alcohol intake 	<ul style="list-style-type: none"> • Vital signs • Neurological Assessment <ul style="list-style-type: none"> – Glasgow Coma Scale 17 – Pupil assessment 20 <ul style="list-style-type: none"> – ‘pinpoint’ with opiates – if unequal consider head injury – motor weakness and ataxia – gag reflex <ul style="list-style-type: none"> – never a reliable indicator of neurological status, normally absent in many individuals, rely instead on clinical assessment of patient – if absent, consider oro-nasopharyngeal airway, DO NOT LAVAGE OR GIVE CHARCOAL • Presence of seizure • Smell of breath <ul style="list-style-type: none"> – ammonia, petrol and alcohol smell as they would in containers – others produce characteristic breath odours, eg. cyanide smells like almonds • Look for ‘blisters’ due to pressure sores; ‘track marks’ with opiates • Drug containers (note date prescription filled and amount missing) to help identify substance and amount ingested

SOME COMMON SIGNS AND SYMPTOMS

SIGNS AND SYMPTOMS	CAN BE INDICATIVE OF
PINPOINT pupils	Drugs with morphine-like activity
DILATED pupils	Atropine-like drugs, alcohol, amphetamines
SORES around or bleeding from nose	Suggests solvent inhalation
BRUISING/PUNCTURE marks over veins	Suggests mainlining of drugs
BLISTERS on soles of feet, palms of hands	Suggests barbiturate poisoning
DYSKINESIA (abnormal muscular movements especially of face, hand and limbs)	Induced by many drugs but in particular Metoclopramide/Chlorpromazine
SWEATING, AGGRESSION, CONFUSION	Suggests hypoglycaemia induced by insulin or oral hypoglycaemic

HAVE THE FOLLOWING INFORMATION AVAILABLE WHEN YOU CALL THE POISONS INFORMATION CENTRE**13 11 26 (24 hours/day)**

- ✓ Product name and manufacturer
- ✓ Route/type of contact with poison
- ✓ How much taken – size of container and amount used
- ✓ Time passed since ingestion or contact
- ✓ Age of patient
- ✓ Obvious signs and symptoms
- ✓ Any existing illnesses
- ✓ Current medications
- ✓ Treatment already given for poisoning

POISONING (INTERVENTION)

CONTACT POISONS INFORMATION CENTRE 13 11 26 (24 hours)

UNRESPONSIVE PATIENT	RESPONSIVE PATIENT
<ul style="list-style-type: none"> • Clear and maintain airway • If gag reflex absent insert airway • Give oxygen at 12 litres/minute • Vital signs and pupils every 15 minutes 20 • Measure blood sugar level (use Glucometer is available) <ul style="list-style-type: none"> – 16 mmol/litre see HYPERGLYCAEMIA 83 – < 4 mmol/litre see HYPOGLYCAEMIA 86 • Remove clothing - look for clues as to drug taken • Get history from reliable witnesses • Establish IV access 206 • If BP is less than 85mmHg systolic <ul style="list-style-type: none"> – give bolus of eg. Gelofusine® 500 mL IV; may repeat x1 249 – follow with crystalloid- eg. Hartmann's solution 240 • If pupils pinpoint and respiration depressed give <ul style="list-style-type: none"> – Naloxone 0.4 mg IV; (if effective, observe closely and repeat if necessary) 278 • If convulsing, manage as per SEIZURES 165 	<ul style="list-style-type: none"> • Obtain HISTORY • Vital signs every 15 minutes • Note obvious signs and symptoms • Establish IV access 206 • For INGESTED poison <ul style="list-style-type: none"> – DO NOT INDUCE VOMITING of corrosive substances, caustics, hydrocarbons (fuels & oils) <p style="text-align: center; color: #C00000;">DISCUSS THE NEED TO ADMINISTER CHARCOAL WITH THE POISONS INFORMATION CENTRE</p> <p style="text-align: center; color: #C00000;">ONLY USE GASTRIC DECONTAMINATION AND/OR ACTIVATED CHARCOAL IF ADVISED BY DOCTOR OR POISONS INFORMATION CENTRE</p>
DO NOT INDUCE VOMITING	
TRANSFER TO HOSPITAL	

PSYCHIATRIC EMERGENCY (FOCUSSED ASSESSMENT)

Advice is available from the PSYCHIATRIC EMERGENCY TEAM (Rural FREECALL) or (24 hours) 1800 676 822
For Southwest: 1800 555 336

NOTE: It is not expected that Remote Area Nurses will have the knowledge and skills to identify psychiatric illness. In all cases the aim is to protect yourself and then the patient and others and to prepare for a safe transfer to hospital.

- A psychiatric emergency can involve:
 - an acute psychotic episode with aggressive behaviour due to mental illness or reaction to drugs or the environment
 - delirium (most often delirium tremens due to alcohol withdrawal)
 - severe depression with danger of self-harm, suicide
- If an underlying medical problem is obvious, go directly to that section (eg. head injury, delirium tremens, hypoglycemia, hypoxia)

RESPONDING TO VIOLENCE

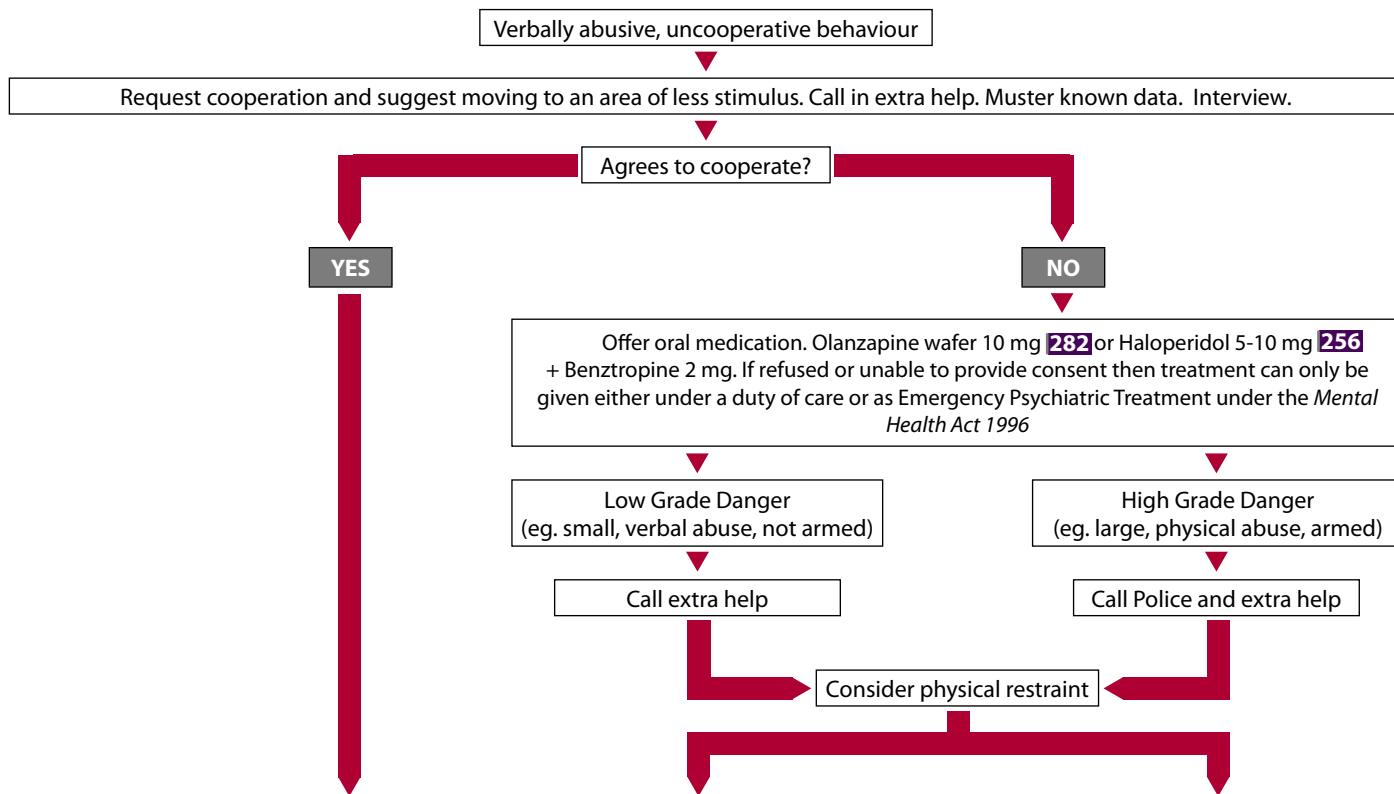
Every effort should be made via the risk management process to prevent violence from occurring. Responses may include calling for backup, security or local police.

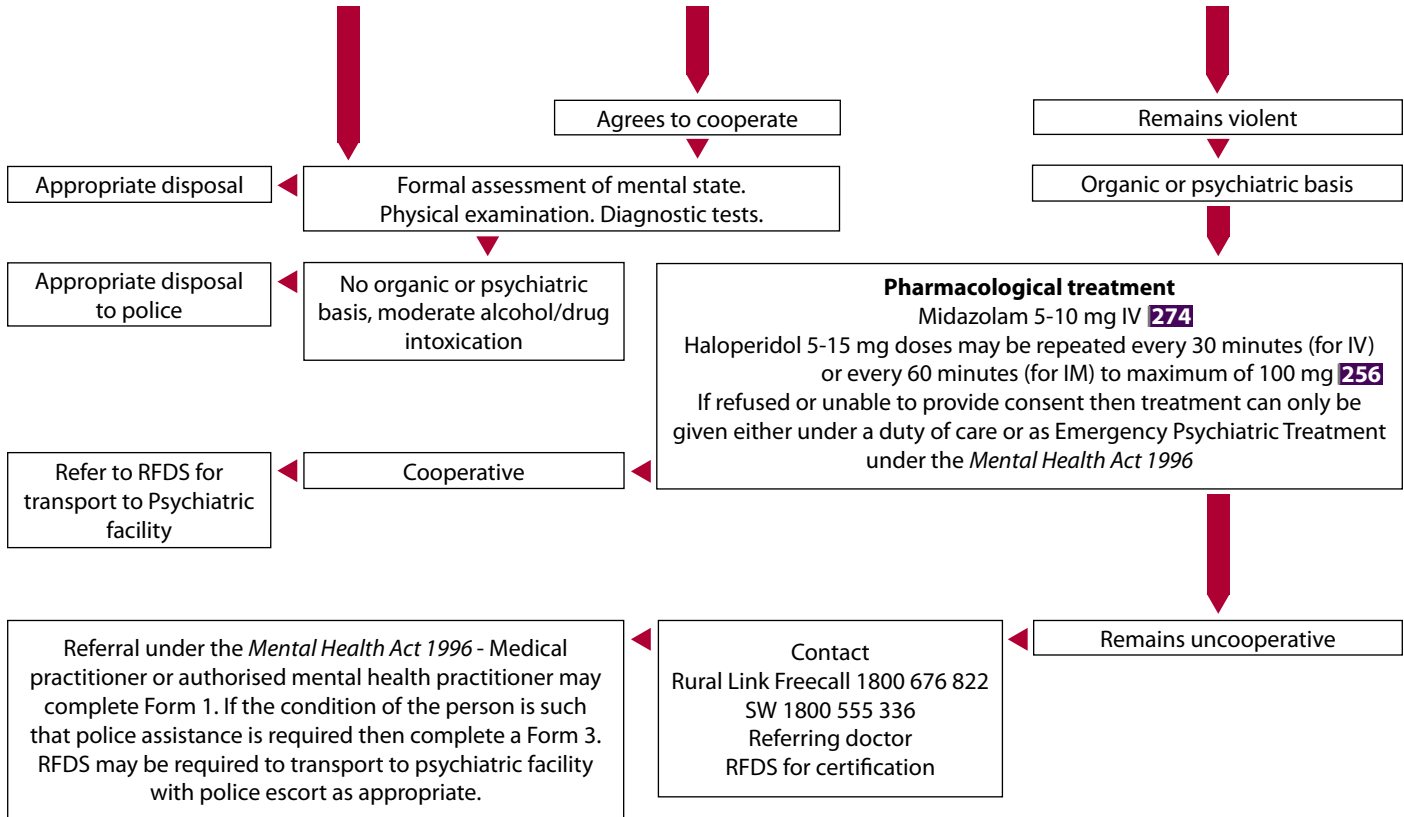
Zero tolerance is:

“a complete refusal to tolerate aggressive behaviours. It is important to differentiate unacceptable workplace aggressive behaviour from behaviour as a result of a medical condition eg. dementia, hypoxia, and brain injury.” Department of Health, WA. (2004). p9.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

MANAGEMENT OF THE VIOLENT AND DISTURBED PATIENT





MENTAL STATE ASSESSMENT

- Appearance
 - grooming, posture, clothing, build
- Behaviour
 - disruptive, deviating from the norm for that environment
 - psychomotor activity, mannerisms, gait
- Mood (what he/she describes)
 - showing inappropriate responses to situations, eg. laughter, sadness, anger, withdrawn
- Affect (what you describe)
 - labile, flattened, blunted, restricted, euthymic
- Speech
 - rate, volume, flow, eg. pressured, loud, slurred, mumbled
- Thought form
 - flight of ideas, derailment
- Thought content
 - eg. delusions, suicidal thoughts
- Perceptions
 - hallucinations
 - illusions eg. visual, auditory, olfactory, gustatory, tactile
- Orientation
 - eg. time, place, person
- Insight/judgement
 - cognition, understanding of illness
- Memory
 - short and long-term

SUBJECTIVE ASSESSMENT Often information must be gathered from patient's family or friends.	OBJECTIVE ASSESSMENT
<ul style="list-style-type: none"> • Is the patient an obvious danger to you, themselves or others? • What is the immediate precipitating factor to the patient (or his family/friends) seeking help? <ul style="list-style-type: none"> – obtain a detailed account of the last 48 hours • Psychiatric history <ul style="list-style-type: none"> – previous similar incidents – medication (If on medication, is it being taken?) • Medical history <ul style="list-style-type: none"> – previous/current medical illnesses – current medication/treatment • History of drug use <ul style="list-style-type: none"> – alcohol (amount and frequency of intake) – history of any other drug abuse – use of illegal drugs – recent drug intake/use, or withdrawal from regular intake/use • Recent sleep disturbance (auditory hallucinations can make a person afraid to sleep leading to sleep deprivation and exacerbation of mental problem) • Recent change in circumstances or stressful event (eg. loss of family member) 	<ul style="list-style-type: none"> • Consider possibility that behavioural problem has a physical basis, such as: <ul style="list-style-type: none"> – head injury – alcohol withdrawal/ delirium tremens – hypoglycaemia – other medical conditions • Observe for obvious deterioration in nutritional status, hygiene, or general appearance

When taking details on drug use ask the following:

- What drug
- How much
- When last used
- Route

AGGRESSION

FOR ALL CASES OF AGGRESSIVE BEHAVIOUR

- | | |
|--|--|
| <ul style="list-style-type: none">• If a patient is agitated and aggressive and there is a danger to self or others, the first aim must be to settle the situation by talking to the patient• Maintain low voice and use simple terms; explain what you are going to do before acting• If talking to him/her is not working then medication can be used (see box below for drugs and dosages), where safe transfer to hospital is not possible without adequate pharmacological restraint• Protect yourself, make sure there are enough people around to safely restrain the patient• Act in a calm, rational manner, maintain self-control. | <ul style="list-style-type: none">• Avoid actions that might be perceived as threatening by a hallucinating, confused patient, eg. raising arms, verbal challenges, whispering to others• Do not stare into patient's eyes. Focus on the neck; this is less threatening• Observe general physical condition. Treat any identified medical conditions as per relevant flowchart• Do not leave sedated patient unattended. Monitor closely but try to let him/her sleep as much as possible (sleep deprivation from auditory hallucinations may be a MAJOR part of the disturbance) |
|--|--|

PHARMACOLOGICAL RESTRAINT

- A single dose should be given stat. Use either:
 - Olanzapine wafer 10 mg orally, **282** or solution 10 mg IM or 5-10 mg oral Haloperidol **256**. Consideration should be given to the addition of 1-2 mg of Benztropine IM or oral for the control of extra pyramidal side effects from the Haloperidol **256**
 - Haloperidol 5-15 mg doses may be repeated every 30 minutes (for IV) or every 60 minutes (for IM) to maximum of 100 mg **256**
 - Supplement Haloperidol with Midazolam 2.5 Mg IV or 5 mg IM or Clonazepam 2 mg IM if required for adequate sedation **274**

DOSAGES WILL DEPEND ON SIZE AND GENERAL PHYSICAL HEALTH OF THE PATIENT AND THE LEVEL OF AGGRESSION DISPLAYED. THESE DRUGS ARE RELATIVELY SAFE IN LARGE DOSES, ESPECIALLY IN YOUNG, STRONG MALES.

MANAGING AGGRESSIVE BEHAVIOUR

IF ALONE	IF ASSISTANCE IS AVAILABLE
<ul style="list-style-type: none"> • Remain calm, act passively and talk quietly to the aggressor in an attempt to establish the nature of the problem and, if possible, defuse the situation before the aggression magnifies • If unresolved, summon assistance (you should plan in advance how this will be done) • Avoid physical contact, eg. try to place a distance or substantial object between yourself and the aggressor • Face the aggressor at all times; do not turn your back • Keep your hands empty; do not pick up anything that might be seen by the patient as a weapon • If necessary and there is no immediate danger to others, withdraw quietly from the situation, do not back yourself into a corner • Do not attempt to restrain a patient trying to abscond. Persuade the patient verbally if possible. If not possible let the patient go and report the incident immediately to the police • Restrain the aggressor only if there is a danger to you, the patient, or to others and it is safe to do so. Property is expendable 	<ul style="list-style-type: none"> • Approach the aggressor only when sufficient (ideally four) staff are present to avoid injury and ensure rapid control • Determine who can most effectively interact with the patient. This will require a judgment regarding the ability of others (eg. a health worker) to remain calm and in control • This person should approach the patient in a calm, non-dominating manner and should be the only person who talks to the patient • If restraint is necessary, the degree of force used should be the minimum required to control violence and should be applied in a way that attempts to calm rather than provoke further aggressive action • Physical handling of the patient <ul style="list-style-type: none"> – clothing, in preference to limbs, should be used to restrain; – when limbs are grasped, they should be held near a major joint to reduce leverage and the possibility of fracture or dislocation – placing the patient on the floor reduces the leverage and makes it difficult for the patient to lash out – the patient's shoes/boots should be removed – in exceptional cases, (ie. when the patient is biting), the hair may be firmly held, and – on no account should pressure be applied to the chest, throat or neck. Neck holds and locks are potentially lethal and must not be used under any circumstances

PREVENTION OF AGGRESSION

Where there is recognised danger of aggression there are some strategies which may be employed to defuse the situation:

- Observe and anticipate patient's mood and communicate effectively with others involved (health workers, family)
- Show interest in and understanding of the patient's problems and fears
- Be a good listener and follow through any obligations or promises made
- Be honest, consistent and reliable in order to establish a relationship of trust
- Be aware of your own, patient's and others' reactions to hostility and aggression and assist, where possible, to calm these feelings
- It may be useful to have a friend, family member or health worker interact with the patient. Get others involved only if you think that they can remain calm and not react inappropriately. They may be able to identify an underlying problem and/or calm the patient.

USE OF RESTRAINTS

Adapted from: Guidelines for the use of restraint in Western Australia. Nurses Board of Western Australia, 2004.

The purpose of restraint

Restraint should be used as a temporary solution to challenging behaviour or circumstantial factors, and its use should only be

considered when all alternative options to address the issue have been explored and deemed inappropriate. Except in emergency situations, consent to any proposed restraint should be obtained in advance to ensure that the person to be restrained is given the opportunity to exercise his or her own free will. Should a person's behaviour present a serious risk to others or to property, common law covers the decision to authorise the use of restraint. The least restrictive method of restraint should be used and the rights and dignity of the restrained person respected at all times.

Restraints may be physical, environmental or chemical, according to the circumstances. Chemical restraints may only be used on the advice of a medical practitioner (including in compliance with standing orders). All aspects of the decision making process relating to the use of a restraint and care provided throughout the period of restraint need to be clearly documented.

The Department of Health WA has implemented a "Zero Tolerance" approach to workplace aggression and violence, which provides the right for all health care workers to a safe work environment. Health workers employed by the Department of Health are public officers for the purposes of the Criminal Code: (Section 1, *The Criminal Code, and Public Service Management Act 1994*). Any person who assaults a public officer, who is performing a function of his/her office or employment, is guilty of a crime and liable for imprisonment for 10 years (section 318(1)(d) of *The Criminal Code*).

Police officers have the right to apprehend a person who is behaving in a threatening or abusive manner and should be contacted for this purpose when necessary.

DELIRIUM (FOCUSSED ASSESSMENT AND INTERVENTION)

Delirium is a mental disturbance of relatively short duration usually reflecting a toxic state marked by illusions, hallucinations, delusions, excitement, restlessness and incoherence.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- | | |
|---|--|
| <ul style="list-style-type: none"> • Immediate danger to self or others • Level of consciousness (delirium is characterised by clouding of consciousness) 17 | <ul style="list-style-type: none"> • Attempt to identify medical cause of delirium and aim to treat that. • Consult relevant intervention (eg. hypoglycaemia, head injury, seizures) for detailed treatment regime 86 191 165 |
|---|--|

SUBJECTIVE ASSESSMENT

Seek information from family or anyone available with knowledge of patient and recent events

- History of episode
 - When did it start?
 - What symptoms have been noted?
 - tremulousness, irritability
 - difficulty sleeping
 - hallucinations
 - any recent illness/injury
 - any other precipitating factors
- Previous similar episodes
- Any known psychiatric condition
- Alcohol use (amount of regular intake, length of any abuse identified)
- Recent reduction/cessation of alcohol use eg. because of illness

OBJECTIVE ASSESSMENT

- Vital signs
 - temperature (elevation may indicate underlying infection, fever may be cause of delirium)
 - pulse (slow may indicate head injury, weak, 'thready' may indicate cardiac failure)
 - blood pressure (usually high but if low may indicate head injury)
- Blood sugar level
- Level of hydration (note skin turgor)
 - observe urinary output

INTERVENTION IN ALL CASES OF DELIRIUM

- Maintain calm, non-stimulating environment
- Approach the patient in a calm, reassuring manner
- Observe the patient closely, protect him/her from self-injury

COMMON CAUSES OF DELIRIUM INCLUDE

Infections*	Sepsis, encephalitis, meningitis, syphilis, CNS abscess
Withdrawal*	Alcohol, barbiturates, sedatives
Acute metabolic disorder*	Hypovolemia, acidosis, electrolyte disturbance, hepatic and renal failure, (glucose, magnesium, calcium)
Trauma	Head injury, burns
CNS disease	Haemorrhage, ischemic stroke, vasculitis, seizures, tumour
Hypoxia	Acute hypoxia, chronic lung disease, hypotension
Deficiencies	B12, niacin, thiamine due to malnutrition
Environmental/endocrine	Hypo/hyperthermia, diabetes, adrenal thyroid disorders
Acute vascular	Hypertensive crisis, subarachnoid haemorrhage, pulmonary embolus
Toxins/drugs*	Medications, street drugs, alcohol, carbon monoxide, cyanide, solvents
Heavy metals	Lead, mercury

* most common causes

Adapted from Chan & Noone (2002)

Prescription drugs known to cause delirium include H2 antagonists, narcotics including codeine, warfarin, isosorbide, theophylline, calcium channel blockers, digoxin, diuretics and antibiotics, chronic aspirin use and lithium toxicity.

THE AIM IS TO IDENTIFY THE CAUSE AND TREAT IT

Emergency mental health manual (2002). Edited by Chan, A. & Noone, J.A. University of British Columbia: Mental Health Evaluation & Community Consultation Unit: Vancouver.
<http://www.mheccu.ubc.ca/publications/emh-manual/emh-manual.pdf>

DELIRIUM TREMENS (FOCUSSED ASSESSMENT AND INTERVENTION)

ANYONE PRESENTING WITH DELIRIUM TREMENS IS LIKELY TO HAVE ANOTHER PHYSICAL ILLNESS WHICH CAUSED THEM TO STOP DRINKING

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Client presents as: <ul style="list-style-type: none"> – agitated, irritable, sweating, and tremulous – possibly with paranoid ideas with history of recent alcohol withdrawal (2 to 10 days) • Observe closely for signs of other physical conditions, which may have precipitated the alcohol withdrawal, treat as appropriate 	<ul style="list-style-type: none"> • Restrain as necessary to prevent injury • May give Diazepam 5-15 mg IV 243 if required for sedation (Haloperidol is not a good sedative). Psychiatric treatment may be given with the consent of the patient. If the patient refuses or is unable to give consent then treatment can only be provided under a duty of care or under <i>Mental Health Act 1996</i> as Emergency Psychiatric Treatment. • Monitor vital signs • Establish IV access 206 <ul style="list-style-type: none"> – if signs of dehydration 130, give 1 litre of Hartmann's over 3 hours 240 • Treat seizures, if they occur, as per flowchart page 165 • Give Thiamine 100 mg IM 299
TRANSFER TO HOSPITAL	

RESPIRATORY DISTRESS (SEVERE) (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- | | |
|---|---|
| <ul style="list-style-type: none"> • Skin colour (pallor, cyanosis) • Level of consciousness (ie. ability to speak) • Chest shape and movement | <ul style="list-style-type: none"> • Respiratory status <ul style="list-style-type: none"> – ability to cough – ability to move air |
|---|---|

SUBJECTIVE ASSESSMENT

- History of present episode
 - How long have symptoms been present? What were you doing when they occurred?
 - Precipitating factors such as exposure to toxins, allergies, anxiety, upper respiratory tract infection?
 - Is the patient becoming fatigued?
 - Reason for acute exacerbation?

OBJECTIVE ASSESSMENT

- VITAL SIGNS
- Rate, rhythm and quality of respirations
 - respiratory rate greater than 18-20 per minute or 40-60 in children
 - note also accessory muscle use and intercostal and sternal retractions
 - Pulse
 - tachycardia (bradycardia with children), may indicate hypoxia
 - Blood pressure
 - Temperature (may need rectal temperature if respiratory rate is increased)
 - fever commonly indicates respiratory infection

Continued next page . . .

SUBJECTIVE ASSESSMENT continued	OBJECTIVE ASSESSMENT continued
<ul style="list-style-type: none"> • Associated symptoms <ul style="list-style-type: none"> – cough (describe any sputum) – wheezing – chest pain <ul style="list-style-type: none"> – pleuritic (sharp pain on inspiration) – cardiac (crushing central chest pain, may radiate) – presence of orthopnoea or paroxysmal nocturnal dyspnoea usually indicates cardiac origin (difficulty lying flat/ breathing at night) – fever, chills – ankle oedema – voice changes – degree of anxiety • Measures taken to relieve symptoms, such as nebuliser, medications • Past medical history <ul style="list-style-type: none"> – lung or cardiac disease – usual level of activity – history of smoking – medication, allergies (history of hayfever) – hospitalisations, especially for respiratory disease – any other previous illness – trauma history – family history of asthma – last chest X-ray • Recent stress, emotional event or illness 	<p>GENERAL OBSERVATIONS</p> <ul style="list-style-type: none"> • Cyanosis • Stridor, wheeze • Sweating • Distended neck veins • Neurological status 17 • Pulse oximetry • Blood sugar level • Peak flow rate (if patient distressed leave until later) (see PEFR 23 24) • Presence of secretions (colour, consistency) <p>CHEST EXAMINATION</p> <ul style="list-style-type: none"> • Chest movements • Bilateral comparison • Auscultation (crackles, wheeze, stridor) • Signs of external trauma (eg. chest deformity)

RESPIRATORY DISTRESS (SEVERE)

INTERVENTION ALL CASES	
<ul style="list-style-type: none"> • Vital signs and peak expiratory flow rate if possible 23 24 • Oximetry if available • Obtain history • Establish IV access 206 	<ul style="list-style-type: none"> • Look for <ul style="list-style-type: none"> – altered conscious state 17 – rib retraction, paradoxical uneven chest movement – sweating – cyanosis
TRANSFER TO HOSPITAL	

GROSS UPPER AIRWAY OBSTRUCTION

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Stridor • Cyanosis • Ineffective respiratory effort 	<ul style="list-style-type: none"> • Clear upper airway with fingers or suction • If obstruction thought to be cause (see CHOKING 71) • Give oxygen at 12 litres/minute
See guidelines for INTERVENTION ALL CASES TRANSFER TO HOSPITAL	

SEVERE PULMONARY OEDEMA / LEFT VENTRICULAR FAILURE

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Dyspnoea • Frothy sputum • 'Bubbly sounding' respirations • Wet crackles, especially lung bases • Occasionally ischaemic chest pain (see CHEST PAIN 66) 	<ul style="list-style-type: none"> • Intervention in all cases of Severe Respiratory Distress on 161 • Sit patient up • Give oxygen at 12 litres/minute • Give Morphine 2.5 mg IV 276 (dilute 10 mg Morphine with 9 mL Normal Saline, give 2.5 mL 296) • Give 80 mg Frusemide IV 247 • Monitor urinary output (may have to insert urinary catheter) <p>If BP > 120mmHg systolic, give sublingual Glyceryl Trinitrate (Anginine®) (may be repeated) 254</p>
<p>Differentiation from Chronic Obstructive Airway Disease can be difficult. Always contact the doctor if in doubt.</p> <p style="text-align: center;">TRANSFER TO HOSPITAL</p>	

CONSIDER THESE OTHER CONDITIONS

- Choking **71**
- Chest infection
- Pulmonary embolus
- Pneumothorax
- Salicylate poisoning
- Diabetic Ketoacidosis **83**
- Smoke or noxious gas inhalation **144**
- Hysterical over-breathing

MELIOIDOSIS

Indigenous Communities Environmental Health Resources http://iceh.uws.edu.au/fact_sheets/FS_melioidosis.html accessed April 2004
 Cheng.A.C et al. 'Melioidosis in northern Australia', 2001-02. Communicable Disease Intelligence, Vol 27, No 2, 2003,
<http://www.cda.gov.au/pubs/cdi/cdi2003.htm>

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**
 Follow Respiratory Distress Focussed Assessment **159**

KEY ASSESSMENT POINTS

- | | |
|--|--|
| <ul style="list-style-type: none"> • Melioidosis is caused by the Gram negative bacterium <i>Burkholderia pseudomallei</i>, a gram negative bacterium present in soil and surface water | <ul style="list-style-type: none"> • This disease is uncommon and occurs in northern Australia, presenting during the wet season • People with skin wounds have a higher risk of being infected • Other risk factors include diabetes, alcohol-related problems, renal disease, immunosuppressed and malignancy |
|--|--|

SIGNS AND SYMPTOMS

INTERVENTION

- | | |
|---|---|
| <ul style="list-style-type: none"> • Pneumonia • Fever • Headaches • Confusion • SOB • Dysuria • Skin ulcers or abscesses • Internal organ abscesses • Septicaemia | <ul style="list-style-type: none"> • Take history • Treat presenting symptoms • Blood cultures prior to antibiotic treatment 2 G Ceftriaxone 238 • Will need IV antibiotics and long-term oral antibiotics |
|---|---|

TRANSFER TO HOSPITAL

ACUTE ASTHMA

ADDITIONAL RESOURCE: Asthma management handbook. National Asthma Foundation, 2003.

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

Refer to patient's INDIVIDUAL ASTHMA ACTION PLAN
 (if not available continue)

Salbutamol (adult 5 mg) nebuliser or 16 puffs inhaled Salbutamol via spacer, repeated after 15 minutes if required with oxygen, at least 6 litres/minute **292**
 (ASSESS SEVERITY)

MILD ATTACK

- Respiration less than 25/minute
- Heart rate less than 120/minute
- Peak flow greater than 150 **23**
- Dyspnoea +
- Wheeze +
- Use of accessory muscles
- Patient able to converse

- Oxygen at 6 litres/minute
- Serial vital signs (including PEFR)
- Reassure patient
- Repeat nebuliser/16 puffs

Consult doctor if pt improves prior to discharge

IF PATIENT DETERIORATES

SERIOUS ATTACK

- Respiration greater than 25/minute
- Heart rate greater than 120/minute
- Peak flow less than 150 **23**
- Dyspnoea ++
- Wheeze ++/silent
- Use of accessory muscles +
- Patient exhausted, unable to speak

- Continuous bronchodilator (nebuliser) with oxygen at 12 litres/minute
- Establish IV access **206**
- Reassure patient
- Give Hydrocortisone 100 mg IV **259** (give IM if no IV access)

TRANSFER TO HOSPITAL

IF PATIENT DETERIORATES

LIFE THREATENING ATTACK

- Any symptoms of severe/serious attack
- Decreased level of consciousness **17**
- Inability to speak
- Cyanosis of lips/mouth
- Bradycardia below 60/minute
- Respiratory arrest

- Initiate CPR as indicated
- Establish IV access **206**
- Oxygen at 12 litres/minute
- Adrenaline 1:10,000 IV **230** (1 mL every 2 minutes until better) give IM if no IV access
- Continuous nebulised salbutamol until condition improves then every 15 minutes 5 mg/mL with 2 mL NaCl 0.9%
- Hydrocortisone 200 mg IV **259**
- Vital signs every 15 minutes

TRANSFER TO HOSPITAL

SEIZURES/CONVULSION

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

FITTING PATIENT

- | | |
|--|--|
| <ul style="list-style-type: none"> • Insert airway if possible (do not force, may cause injury) • Provide protective environment | <ul style="list-style-type: none"> • DO NOT restrain patient • Give oxygen at 12 litres/minute • Suction as necessary |
|--|--|

Patient awake	Patient NOT awake
Consider: syncope or minor seizure	Prolonged seizures longer than 10 minutes STATUS EPILEPTICUS
<ul style="list-style-type: none"> • Maintain comfortable position • Vital signs every 15 minutes until stable • Check blood sugar level • Ensure patient is not left unattended • Provide emotional support to family • Assess patient for underlying cause • Give routine medication as documented if known epileptic • Consult with doctor regarding transfer to hospital 	<ul style="list-style-type: none"> • Maintain airway and continue oxygen • Position patient on side if possible • Establish IV access if possible 206 • Treat as below. CONSULT DOCTOR IF POSSIBLE AT THIS STAGE • Check blood sugar level (if below 4 mmol/litre give 50 mL Glucose 50% IV bolus (for adults) 253 to reverse hypoglycaemia • DO NOT give Phenobarbitone with/after Diazepam unless directed by a doctor 243 • Adults-0.2 mg/kg Midazolam IMI/IV 274 or 0.5 mg/kg Diazepam PR to a maximum of 10 mg 243 May repeat once after 10 minutes if required • Paediatrics-0.15 mg/kg Midazolam IMI/IV or 0.4 mg/kg 274 Diazepam PR up to a maximum of 10 mg. May repeat after 10 minutes if required • Paediatric hypoglycaemia <4 mmol/litre in seizure patient-2 ml/kg IVI 25% Dextrose

References: Princess Margaret Hospital Seizure Guidelines 2004; Armadale Kelmscott Hospital, Emergency Department, Guidelines for Seizure Patient, 2004.

ANYONE who:

- Has a first convulsion
- Is pregnant or
- Is under 5 years old

SHOULD BE INVESTIGATED IN HOSPITAL

CONSIDER THESE CONDITIONS:

- Epilepsy
- Withdrawal from alcohol, other drugs
- Meningitis **90**
- Acute head injury **191**
- Renal failure
- Hypoxia
- Hypoglycaemia **86**
- Brain tumour/abscess

SEXUAL ASSAULT (ADULTS) (18 YEARS AND OVER)

TREAT SEXUAL ASSAULT AS AN EMERGENCY

Sexual Assault Resource Centre (SARC)
(WA) Crisis Line (24 hours)
1800 199 888 (country callers) or 08 9340 1828

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

IMMEDIATE MANAGEMENT

1. Exclude and/or treat any serious injury
2. Provide emotional support
 - listen and believe
 - ensure privacy/confidentiality
 - provide a safe environment
 - avoid judgemental comments
 - offer to contact a support person of their choice
3. Address medical concerns
 - offer medical examination
 - for 'reassurance'
 - if PV bleeding/pain or PR bleeding/pain, internal examination to assess injury is especially important
 - Address risk of pregnancy
 - offer emergency contraception within 72 hours
 - Address risk of sexually transmitted infection
 - prophylactic antibiotics
 - prophylactic hepatitis treatment (immunoglobulin or vaccine)
 - ? HIV prophylaxis (discussion of risk)

FORENSIC ASSESSMENT (even if the patient is only considering reporting to police)

THE CORRECT ASSESSMENT PROCEDURE IS VITAL IF THE EVIDENCE IS TO BE LEGALLY VALID
AVOID UNNECESSARY EXAMINATIONS PRIOR TO THIS
ASSESSMENT SHOULD BE PERFORMED BY DOCTOR OR BY RAN WHO IS COMPETENT IN THE PROCEDURE

RFDS to bring doctor to health centre if person is not willing to be transferred to hospital

- Take appropriate history (concise and relevant)
- Assess need for forensic examination in consultation with doctor
 - type of assault
 - duration since assault
 - activities since assault (washing/passing urine/sex with a partner since these DO NOT rule out relevance of examination)
- Sperm is detectable in endocervical canal for up to 10 days, mouth up to 6 hours and rectum up to 48 hours

- Two parts to forensic examination:
 1. Injury documentation
 2. Collection of specimens (semen, saliva, blood, etc)
- Preliminary forensic specimens can be taken, to allow for patient comfort, if there will be a delay before forensic examination:
 - urine (first void)
 - vulval gauze wipe
 - mouth rinse
 - oral swab and slide
 - peri-anal gauze wipe

Use SARC Kit when available

For detailed guidelines, please refer to SARC Manual &/or Guidelines for Rural Nurses and Health Workers.
For SARC Kit/Manual order forms, phone Perth SARC during office hours 08 9340 1820, Country 1800 199 888

CHILD SEXUAL ABUSE (UNDER 18 YEARS)

For advice on how to deal with sexual abuse/assault in children you should contact the CHILD SEXUAL ABUSE UNIT Princess Margaret Hospital 08 9340 8222 and ask for the duty social worker (24 hours) or during normal working hours ring 9340 8646

For more information refer to Department of Health Child Abuse Guidelines at <http://intranet.health.wa.gov.au/royalstreet/docs/PH/child%20abuse%20guidelines>

Sexual abuse/assault in children requires a different approach to adult situations. There is less often forensic evidence that is collectable. The history from the child is very important and should be collected by a person who is able to collect the information in a child-focused manner. As the protection of the child is paramount, Family and Children's Services and police may need to be involved early in the investigation. As in adult sexual assault, someone who is skilled in this area of medical practice should undertake the examination of the child.

There is a 24-hour roster of child sexual abuse consultants available at Princess Margaret Hospital. They are available for over-the-phone consultation and are contactable via switchboard at Princess Margaret Hospital.

If in doubt do not bathe the child before consultation. The physical examination is on similar lines to that outlined for persons over 13 years of age. Children who are pubertal may need the "morning after pill" if conception is a consideration.

SHOCK (ASSESSMENT)

Shock is defined as the failure of the circulatory system to provide adequate tissue perfusion and is most commonly due to inadequate circulatory volume (cardiogenic shock is the exception, of course). Whatever the cause, the symptoms of shock are similar and, except in cardiogenic shock, restoration of fluid volume is of major importance in treating shock.

COMMON CAUSES OF HYPOVOLAEMIA		
<ul style="list-style-type: none"> • Trauma (leading to blood loss) <ul style="list-style-type: none"> – ruptured internal organs – lacerations – disrupted vasculature – long bone or pelvic fractures 	<ul style="list-style-type: none"> • Crush injury • Burn injury • Gastrointestinal bleed • Ruptured ectopic pregnancy 	<ul style="list-style-type: none"> • Loss of fluid from the circulation through other means such as diarrhoea, excess urinary output in diabetes, inadequate fluid intake.

ASSESSMENT (INDICATORS OF INADEQUATE TISSUE PERFUSION)	
State of consciousness	<ul style="list-style-type: none"> • Reduced cerebral perfusion results in a depressed level of consciousness 17 • Resuscitation to restore cerebral perfusion becomes urgent when the conscious level is depressed
Skin colour	<ul style="list-style-type: none"> • Significant hypovolaemia results in peripheral vasoconstriction and skin pallor, with prolongation in nailbed capillary return beyond 2 seconds. This is not a good sign in a patient with mild to moderate shock. (Cool, clammy skin)
Pulse	<ul style="list-style-type: none"> • Tachycardia is the first sign of blood loss and occurs with a blood volume loss of 10 to 15%, that is, up to 750 mL loss in a 70 kg man • Pulse could be slow if severely hypovolaemic
Blood pressure	<ul style="list-style-type: none"> • A reduced systolic blood pressure as a result of hypovolaemia is a LATE sign in most healthy supine patients and occurs at a blood volume loss of about 30% (ie. 1500 mL in a 70 kg man). Postural hypotension, ie. normal blood pressure when supine but hypotension when head elevated, occurs earlier
Urinary output	<ul style="list-style-type: none"> • Reduced kidney perfusion results in decreased urinary output
Tachypnoea	<ul style="list-style-type: none"> • 'Air hunger' results from inadequate oxygen delivery to body cells

SHOCK (INTERVENTION)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

URGENT ACTION

(A diagnosis of hypovolaemic shock must lead to volume replacement)

- | | |
|--|--|
| <ul style="list-style-type: none"> Establish adequate airway and breathing Control obvious bleeding Give high-flow oxygen (> 12 L/min) Establish IV or intraosseus cannula access 206 See fluid replacement below | <ul style="list-style-type: none"> Place patient in recumbent position, elevate bleeding part(s) and legs Insert urinary catheter and measure output hourly Vital signs every 15 minutes Glasgow Coma Scale if level of consciousness alters 17 |
|--|--|

TRANSFER TO HOSPITAL

FLUID REPLACEMENT (ADULT)

Type of solution	<ul style="list-style-type: none"> The use of either crystalloid (Hartmann's solution, Normal Saline 240 296) or colloidal (Gelofusine® 249) solution is effective and will resuscitate the patient if administered in volumes appropriate to fluid loss If haemorrhage is the cause of the hypovolaemia, blood transfusion will be necessary. Colloidal and crystalloid solutions can in most cases reverse the most significant effects of blood loss
Volume	<ul style="list-style-type: none"> The amount of blood loss can be difficult to determine and in other types of shock the fluid deficit is difficult to assess. The best gauge of fluid requirement is to observe the clinical response to a bolus of administered fluid (1 litre for example). Observe for improvements in blood pressure and pulse. If the shock is believed to be due to heart failure, give lower fluid doses.
Aim to keep	<ul style="list-style-type: none"> Pulse less than 120 per minute Systolic blood pressure more than 100mmHg Urine output more, than 0.5 mL/kg/hour (approximately 30 to 50 mL per hour)

FLUID REPLACEMENT (PAEDIATRIC)

Type of solution	<ul style="list-style-type: none"> The use of either crystalloid (Hartmann's solution, Normal Saline 240 296) or colloidal (Gelofusine® 249) solution is effective and will resuscitate the patient if administered in volumes appropriate to fluid loss If haemorrhage is the cause of the hypovolaemia, blood transfusion will be necessary. Colloidal and crystalloid solutions can in most cases reverse the most significant effects of blood loss If dehydration is the cause of the hypovolaemia, replacement by crystalloid solutions is initially recommended Colloids are generally only used for profound shock secondary to dehydration High percentage dextrose infusions should not be used to treat volume deficit. They may be used to maintain glucose levels and are given as a slow infusion
Volume	<ul style="list-style-type: none"> The amount of blood loss can be difficult to determine and in other types of shock the fluid deficit is difficult to assess Dehydration: <ul style="list-style-type: none"> treat shock – give 20 mL/kg, up to a maximum of 40 mL/kg calculate the deficit – (weight x % of dehydration x 10) (for % of dehydration 130) calculate the maintenance (100 mL/kg per 24 hours for the first 10 kg; 50 mL/kg per 24 hours for the second 10 kg and 20 mL/kg for per 24 hours additional kgs) add the deficit and maintenance and give over 24 hours Hypovolaemia (blood loss) = 20 mL/kg, to a maximum of 60 mL/kg (think of blood replacement early) The best gauge of fluid requirement in children is to observe the clinical response to a bolus of administered fluid Observe for improvements in pulse rate and capillary refill
Aim to keep	<ul style="list-style-type: none"> Capillary refill < 2 seconds Pulse above 80 beats per minute (according to age) 129 Systolic blood pressure more than 80 mmHg (according to age) Urine output more than 1 mL/kg/hour

TESTICULAR PAIN (FOCUSSED ASSESSMENT)

PRESENTATION

- The two most common conditions that cause acute testicular pain and swelling are TORSION OF THE TESTIS and acute EPIDIDYMO-ORCHITIS. These are often difficult to distinguish (see Differential Diagnosis below).

DIFFERENTIAL DIAGNOSIS

	TORSION	EPIDIDYMO-ORCHITIS
Age	Any age but mostly 10 to 25 years or in infants	Young adults, the elderly, rare before puberty
Onset	Usually sudden	Gradual
Severity of pain	Very severe	Moderate
Fever	Absent or slight (less than 37.5 °C)	Significant
Associated symptoms	Abdominal pain, vomiting	Abdominal pain, occasional dysuria, urethral discharge
Examination	Swollen, red, tender, affected testis may sit higher than the other and be lying transversely	Swollen, red and tender
Effect of elevating scrotum	No change or worse pain	Relief of pain

Other less common causes of acute scrotal pain include: mumps, strangulated inguinal hernia and traumatic haematoma

TESTICULAR PAIN (INTERVENTION)

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

IN ALL CASES

- Consult medical officer IMMEDIATELY in all cases of acute testicular pain
- Observe testis for colour, position and size
- Palpate testis for size, warmth, tenderness, swelling or mass in the scrotum (eg. cyst or haematoma) and spermatic cord
- Compare with the unaffected side

TORSION OF THE TESTIS

- **Testicular torsion is an EMERGENCY CONDITION requiring urgent evacuation and surgery FAST!**
- Evacuation should be arranged as soon as possible if there is to be any chance of saving the testis
- Analgesia as per ANALGESIA REGIMEN **227**

TRAPPED PERSON

Conduct RAPID PRIMARY ASSESSMENT **14** and INITIAL ASSESSMENT. **16**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

REMEMBER:

- The main principle is to remove the crushing object immediately where ABC is compromised
- Compression of the thorax is a LIFE THREATENING EMERGENCY and the crushing objects need to be removed immediately. Failure to do this will lead to respiratory failure and death

ACTION IF TRAPPED WITHOUT COMPRESSION	ACTION IF TRAPPED WITH COMPRESSION
<ul style="list-style-type: none"> • Send someone to call RFDS • Administer oxygen if possible • Arrest obvious haemorrhage • If bleeding site not accessible, consider arterial tourniquet (note time applied) • Administer oxygen if possible • Serial vital signs • Establish IV access if possible 206 • If BP less than 85mmHg systolic give bolus of Gelofusine® 500 mL IV (may repeat x 1) 249 <ul style="list-style-type: none"> – follow with Normal Saline or Hartmann’s (whatever is available) 296 240 • Give analgesia as required as per ANALGESIA REGIMEN 227 • Stay with patient until transfer 	<p>As for ‘Trapped Without Compression’ plus:</p> <ul style="list-style-type: none"> • REMOVE COMPRESSION FORCE SLOWLY (when able) • Prior to removing compression force: <ul style="list-style-type: none"> – increase infusion rate – make sure patient has eye and hearing protection (if Fire and Rescue team are available they should have this equipment) • After removing compression force, monitor vital signs <ul style="list-style-type: none"> – observe for arrhythmia, hypotension
TRANSFER DIRECTLY TO HOSPITAL	

TRAUMA ASSESSMENT

TETANUS: In all injuries where there is a break in the skin, check tetanus immunisation status.

EYES: Pupil size and reaction. Eye movements, double vision (if conscious). See EYE INJURY **188**

NECK/TRACHEA/CERVICAL SPINE:

Remove rigid collar gently and do manual examination of neck with patient's head immobilised by an assistant if possible. Midline deformity, tenderness, step in spine. See SPINAL INJURIES **197**

TENSION PNEUMOTHORAX (TP):

↑ Respiratory distress and heart rate, with falling BP may indicate TP. This is a LIFE THREATENING EMERGENCY & probably the commonest cause of preventable death in the severely injured. Urgent treatment is required. Consult doctor unless circumstances do not allow. Perform NEEDLE THORACENTESIS. **209** See CHEST INJURY **185**

PELVIS: Bruising, deformity, tenderness, fractures

PERINEUM/GENITALIA: Bleeding from the urethra may indicate urethral or bladder injury. DO NOT pass a urinary catheter without discussing with doctor. Check rectum for malena in cases of unexplained shock.

LIMBS: Tenderness, fractures, deformity, discolouration, pulses, neurological function (motor & sensory), range of joint movements. See LIMB INJURIES **193**

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SKULL/FACIAL BONES/NOSE/EARS:

Deformity, haematoma, fracture wounds, bleeding or fluid discharge from ears or nose. See HEAD INJURY **191**

ORAL CAVITY:

Broken teeth, wounds, jaw fracture/mobility.

CLAVICLES/SHOULDERS:

Fractured collar bone. Surgical emphysema.

CHEST:

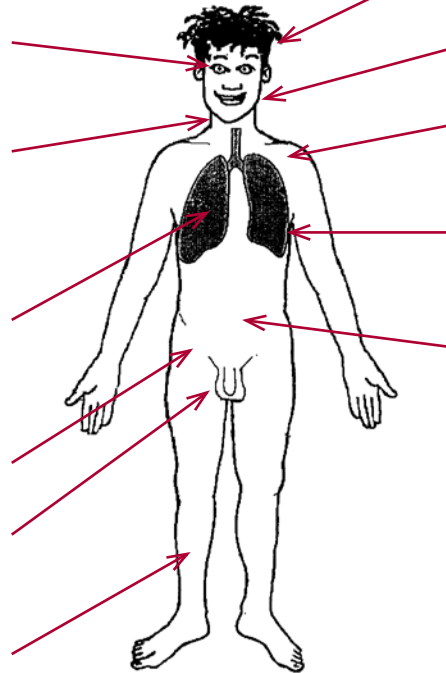
Wounds, bruising, local tenderness, chest movement on respiration, air entry (any added sounds eg. wheeze/crackles). See CHEST INJURY **185**

ABDOMEN:

Wounds, bruising, tenderness, rigidity, bowel sounds, urinalysis (test for blood). See ABDOMINAL INJURY **183**

BACK:

Log roll patient with assistance & check the back for evidence of cervical or other spinal injury, wounds and bruising. See SPINAL INJURY **197**



TRAUMA ASSESSMENT CONT.

You should have already conducted thorough RAPID PRIMARY **14** and INITIAL ASSESSMENTS **16**, and carried out BASIC LIFE SUPPORT **28** if it was necessary. Before you go on to TRAUMA ASSESSMENT **176** you must make sure that urgent/life threatening interventions are carried out immediately as identified (eg. Needle Cricothyroidotomy, Needle Thoracocentesis) **207 209**

INITIAL ASSESSMENT

TAKE NOTE OF:

- Mechanism of injury
- Environmental dangers (to patient and rescuer)
- Positioning of patient
- Deformities of the limbs
- Intervention by retrieval personnel, ie. immobilisation of spine, limbs

ASK THE CONSCIOUS PATIENT:

- Where does it hurt?
- Can you breath/cough without it hurting?
- Can you move your limbs?

FORENSIC EVIDENCE COLLECTION

To preserve evidence when the cause of injury is not known or a crime is suspected:

- Remove clothing – avoid altering areas of damage. Retain potential weapons or objects
- Place items and / or clothing separately into paper bags
- Identify all bags with patient name, date, time and collector's name
- Seal bag with staples and sign seal
- Liaise with police

MECHANISM OF INJURY (ASSESSMENT POINTS)

Road traffic accident	<ul style="list-style-type: none"> Type of vehicle Use of seatbelt Airbag deployed Estimated speed and mechanism of collision Position in vehicle (driver/passenger, rear seat etc.) 	<ul style="list-style-type: none"> Damage to vehicle, especially windscreen, steering wheel Ejection from vehicle Fatality/injuries of others in vehicle
Motorcycle accident	<ul style="list-style-type: none"> Speed and mechanism of injury Distance victim thrown Use of helmet 	
Pedestrian	<ul style="list-style-type: none"> Speed and mechanism of injury Type of vehicle involved Distance victim thrown How did they land? What did they hit? 	
Fall	<ul style="list-style-type: none"> Mechanism: down stairs, from a building, from a moving vehicle Distance/height of fall Age and height of patient Type of object/surface patient landed on, such as cement, grass, water Body position on landing 	
Assault	<ul style="list-style-type: none"> Gender of attacker Type of object used, number and location of blows Were assailants known to patient? 	
Crush injury	<ul style="list-style-type: none"> Mechanism of injury, ie. roller, direct weight Duration of entrapment 	
Penetrating injury	<ul style="list-style-type: none"> Type/size of object involved (knife, gun, spear, etc.) Stab wound (direction, estimated depth of penetration) Gunshot wound (firing distance, number of shots fired, calibre of gun, location of entrance and exit wounds, presence of powder burns on skin or clothing) 	
Predisposing causes of accident	<ul style="list-style-type: none"> CVA, AMI, blackout etc. 	

TRAUMA AND CRITICALLY ILL PATIENT ASSESSMENT

Danger Personal protective equipment (gown, gloves, goggles)

Response Verbal and tactile

Call for Help

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PRIMARY ASSESSMENT	ASSESS (LOOK, LISTEN AND FEEL)	POSSIBLE INTERVENTIONS
Airway (C-Spine)	<p>Look</p> <ul style="list-style-type: none"> • Tongue • Teeth • Vomit • Blood • Oedema • Foreign bodies <p>Listen</p> <ul style="list-style-type: none"> • Talking/airway noises 	<ul style="list-style-type: none"> • Position • Clear airway – suction, manual • Open airway – jaw support or thrust • Maintain airway – oropharyngeal, nasopharyngeal, ETT • Needle or surgical cricothyroidotomy 207 • Cervical stabilisation - rigid collar, sandbags, tape, spinal board
Breathing	<p>Look</p> <ul style="list-style-type: none"> • Colour • Rate • Depth • Symmetry • Accessory muscles • Nasal flaring • Neck vessels • Tracheal position <p>Listen</p> <ul style="list-style-type: none"> • Wheeze/grunting • Auscultate <p>Feel</p> <ul style="list-style-type: none"> • Soft tissue and bony wall integrity 	<ul style="list-style-type: none"> • Oxygen – Non-rebreather at 12-15L/min • Ventilate – bag-valve mask, ETT (inadequate breathing, flail chest) 187 • Needle thoracentesis (tension pneumothorax) 209 • Airtight dressing taped on 3 sides (open pneumothorax) <p>[ICC (haemo-, pneumo-, thorax) later]</p>

PRIMARY ASSESSMENT	ASSESS (LOOK, LISTEN AND FEEL)	POSSIBLE INTERVENTIONS
Circulation	<p>Look</p> <ul style="list-style-type: none"> • Colour • External bleeding • Capillary refill <p>Listen</p> <ul style="list-style-type: none"> • Heart sounds <p>Feel</p> <ul style="list-style-type: none"> • Pulse (rate, rhythm and volume) • Feel skin (temperature, diaphoresis) 	<ul style="list-style-type: none"> • CPR • Direct pressure and elevate • IV access x 2 (Paed intraosseous after 90 seconds or 2 attempts) 206 • Blood cross match & FBC • Warmed IV fluids (Paed 20mL/kg) • Splint pelvic & femur fractures 211 • Pericardiocentesis • Thoracotomy • ICC (haemothorax) • Surgery
Disability	<p>Look</p> <ul style="list-style-type: none"> • AVPU • PERL • Presence convulsive movements • BSL 	<ul style="list-style-type: none"> • Treat hypercapnia • Manage seizure 165 • IV antibiotics 206 • Dextrose <p>(Paed 10% Dextrose 5mL/kg)</p>
RE-CHECK ABCD AFTER EACH INTERVENTION AND BEFORE SECONDARY SURVEY		
SECONDARY ASSESSMENT	ASSESS (LOOK, LISTEN AND FEEL)	POSSIBLE INTERVENTIONS
<ul style="list-style-type: none"> • Expose • Environment 		<ul style="list-style-type: none"> • Expose patient • Warming blanket • Warming lights
<ul style="list-style-type: none"> • Full Set of Vital Signs • Five Interventions • Facilitate Family Presence 	<ul style="list-style-type: none"> • TPR and BP • GCS 	<ul style="list-style-type: none"> • Pulse oximetry • Cardiac Monitor/12 Lead ECG • IDC (if not contraindicated) • Gastric tube (naso or oro) • Laboratory studies/trauma X-ray series (C-spine, chest, pelvis)

SECONDARY ASSESSMENT	ASSESS (LOOK, LISTEN AND FEEL)	POSSIBLE INTERVENTIONS
Give comfort measures		<ul style="list-style-type: none"> • Verbal reassurance • Touch • Pain control (Paed morphine 0.1mg/Kg) 276
<ul style="list-style-type: none"> • History • Head-to-Toe Assessment 	<ul style="list-style-type: none"> • DeMIST • Allergies • Medications • Past history • Last ate • Events prior <ul style="list-style-type: none"> • Head include eyes, ears, nose and mouth • Face • Neck • Chest, include lungs and heart • Abdomen • Flanks • Pelvis and perineum • Extremities 	<ul style="list-style-type: none"> • Another staff member holds patient's head while cervical collar is removed and replaced to allow inspection and palpation of neck • Splint fractures 211 • Further investigations (CT, X-ray, ultrasound, DPL) • Tetanus prophylaxis • Antibiotics • Wound care • Care of amputated part
Inspect Posterior Surfaces	Look <ul style="list-style-type: none"> • Posterior surface Listen <ul style="list-style-type: none"> • Lung fields Feel <ul style="list-style-type: none"> • Soft tissues and bones • Anal sphincter 	<ul style="list-style-type: none"> • While maintaining spinal stabilisation and supporting injured extremities, log roll patient
DOCUMENT		
RE-CHECK ABCD AND VITAL SIGNS		

TRAUMA (INTERVENTION FOR ALL PATIENTS WITH INJURIES)

- | | |
|--|--|
| <ul style="list-style-type: none">• Perform ABC with C-spine precautions. Ensure airway is patent (perform Needle Cricothyroidotomy if necessary 207)<ul style="list-style-type: none">– Give oxygen at 12 litres/minute via non-rebreathing bag– Immobilise spine– Stop external bleeding with direct pressure• Cover sucking chest wounds with an occlusive dressing, sealed on three sides (plastic is effective)• Establish IV access 206• If BP is less than 85mmHg systolic give bolus of Gelofusine® 500 mL IV (may repeat x 1) 249<ul style="list-style-type: none">– follow with Hartmann's solution 240• Search head-to-toe for significant injuries• Cover exposed abdominal viscera with warm saline packs (use steridrape/opside to hold in place)• Neurovascular observation of limbs• Splint major limb fractures, stabilise other fractures 211• Give analgesia as per ANALGESIA REGIMEN 227 | <ul style="list-style-type: none">• Insert urinary catheter (DO NOT insert if blood at urethral opening or bruising to perineum, discuss with doctor first)• Insert nasogastric/orogastric tube (DO NOT insert NG tube if significant facial trauma or suspected base of skull fracture insert orogastric)• Vital signs every 15 minutes• Check:<ul style="list-style-type: none">– blood sugar level– ECG– bi-lateral blood pressure– pulse oximetry if available– capillary refill• Nil by mouth• Apply M.A.S.T. suit if shocked (and available)• Check tetanus status |
|--|--|

SEE RELEVANT SECTION FOR SPECIFIC INJURIES

ABDOMINAL INJURY

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

PENETRATING WOUND			
STAB WOUND	GUNSHOT WOUND	BLUNT TRAUMA	
<ul style="list-style-type: none"> • Appears superficial but should be presumed deep until proven otherwise • DO NOT remove any penetrating object • Take history regarding object: <ul style="list-style-type: none"> – type, width, length, etc. 	<ul style="list-style-type: none"> • Look for: <ul style="list-style-type: none"> – entry/exit wounds – powder burns around site • DO NOT clean around wound 	<ul style="list-style-type: none"> • Look for: <ul style="list-style-type: none"> – shoulder tip pain – bruising, tenderness, rebound – pelvic injuries • Monitor patient's condition carefully 	
<div style="display: flex; justify-content: space-around; margin-bottom: 5px;"> ▼ ▼ ▼ </div> <th>URGENT ACTION</th>			URGENT ACTION
<ul style="list-style-type: none"> • Secure airway • Consider spinal injury • Give oxygen at 12 litres/minute • Cover eviscerated gut with warm, sterile saline packs • Vital signs every 15 minutes • Establish IV access 206 • Maintain systolic BP of 90mmHg with colloid / crystalloid 		<ul style="list-style-type: none"> • Analgesia as per ANALGESIA REGIMEN 227 • Undress patient (examine abdomen, front, back and perineum, or note tenderness, lacerations, clothing imprints, grazes, listen for bowel sounds) • Consider the need to preserve clothing for forensic evidence • Consider urinary catheter, nasogastric tube • Obtain history of incident (mechanism of injury, past medical history) • Nil by mouth 	
<th>TRANSFER TO HOSPITAL</th>			TRANSFER TO HOSPITAL

AMPUTATION (TRAUMATIC)

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

IN ALL CASES

- | | |
|--|--|
| <ul style="list-style-type: none"> • Vital signs every 15 minutes • Observe for shock, if present see SHOCK 170 • Control bleeding • Establish IV access 206 | <ul style="list-style-type: none"> • Support the limb in a functional position if partially severed • Analgesia as per ANALGESIA REGIMEN 227 • Care for amputated part as outlined below • Nil by mouth |
|--|--|

CARE OF AMPUTATED PART

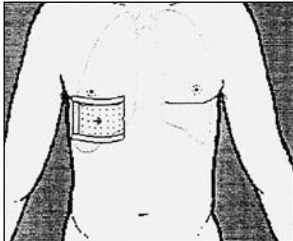
- | | |
|--|--|
| <ul style="list-style-type: none"> • Place part in double plastic bag in the following manner: <ul style="list-style-type: none"> – wrap the part in gauze soaked in saline and place in inner bag – place inner bag with part into outer plastic bag filled with iced water | <ul style="list-style-type: none"> • Keep at hypothermic temperature (4°C) • DO NOT FREEZE |
|--|--|

ALWAYS TREAT AS THOUGH AMPUTATED PART IS GOING TO BE RE-IMPLANTED

CHEST INJURY

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

PENETRATING OR BLUNT INJURY

SIGNS AND SYMPTOMS	INTERVENTION
<p>BLUNT TRAUMA</p> <ul style="list-style-type: none"> • SOB • increasing respiratory rate • chest pain • bruising • restlessness / anxiety • signs of shock • tracheal deviation <p>PENETRATING TRAUMA (As per blunt trauma)</p> <ul style="list-style-type: none"> • open wound +/- sucking wound • foreign body 	<ul style="list-style-type: none"> • Give oxygen 12 litres/minute via Hudson or non-rebreathing mask • For penetrating wounds LEAVE PENETRATING OBJECT IN SITU <ul style="list-style-type: none"> – seal open (sucking) wound on 3 sides with sterile occlusive dressing (or plastic) – the idea is to create a valve effect, so that air can escape but not enter the chest cavity as in Figure 11 below – consult with doctor regarding need for Needle Thoracocentesis 209 prior to air evacuation • If condition of patient worsens after application of dressing, remove dressing and re-evaluate patient <div style="background-color: #800040; color: white; padding: 5px; margin: 10px 0;"> <p>Seal wound on 3 sides with sterile occlusive dressing. The idea is to create a valve effect, so that air can escape but not enter the chest cavity.</p> </div> <ul style="list-style-type: none"> • Establish IV access 206 • Vital signs every 15 minutes • If BP less than 85mmHg systolic give bolus of Gelofusine® 500 mL IV 249 <ul style="list-style-type: none"> – may repeat x 1, follow with Hartmann’s solution 240 • Analgesia as per ANALGESIA REGIMEN 227 • Remove all clothing and assess chest wall/back • Nil by mouth <div style="margin: 10px 0;"> <p>Figure 11: Primary Clinical Care Manual, Queensland Health. (2003).</p> </div> 
<p>TRANSFER TO HOSPITAL</p>	

Possible complications of penetrating injuries include tension pneumothorax and haemothorax

TENSION PNEUMOTHORAX

Adapted from Primary Clinical Care Manual, Queensland Health (2003) with permission from the North Queensland Rural Health Training Unit.

This is a life-threatening emergency and probably the commonest cause of preventable death in the severely injured.
It requires URGENT TREATMENT

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Anxiety • Pain • Increasing respiratory distress • Increasing heart rate • Hypotension • Unequal chest movements • Trachea deviated AWAY from THE AFFECTED SIDE • Decreased air entry on affected side • Distended neck veins. 	<ul style="list-style-type: none"> • As for initial intervention see PENETRATING/BLUNT INJURY 185 • Consult doctor if you can • Perform NEEDLE THORACENTESIS 209
TRANSFER TO HOSPITAL	

PNEUMOTHORAX / HAEMOTHORAX

Adapted from Primary Clinical Care Manual, Queensland Health, (2003) with permission from the North Queensland Rural Health Training Unit.

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Pain • Increasing respiratory distress • Hypotension/shock • Unequal chest movements (+/-) • Trachea may be deviated AWAY from the AFFECTED SIDE • May be decreased air entry and dull percussion on affected side 	<ul style="list-style-type: none"> • As for initial intervention (see PENETRATING/BLUNT INJURY) 185 • Doctor will insert intercostal catheter prior to evacuation
TRANSFER TO HOSPITAL	

FLAIL CHEST

Adapted from Primary Clinical Care Manual, Queensland Health, (2003) with permission from the North Queensland Rural Health Training Unit.

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Pain and respiratory distress with paradoxical movement of an area of the chest wall This means that only part of the chest wall moves in when the patient breathes in, and moves out when the patient breathes out 	<ul style="list-style-type: none"> • As for initial intervention (see PENETRATING/BLUNT INJURY) 185 • Position patient for comfort and to ensure optimal gas exchange • Position so patient is on affected side (this may be uncomfortable but will splint the fracture and allow for maximum inflation of unaffected side)
TRANSFER TO HOSPITAL	

OTHER POSSIBLE COMPLICATIONS	
<ul style="list-style-type: none"> • Myocardial contusion • Cardiac tamponade • Pulmonary contusion • Ruptured diaphragm 	<ul style="list-style-type: none"> • Aortic disruption • Tracheo-bronchial disruption • Oesophageal disruption

EYE INJURY (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- Appearance of eye (laceration, foreign body, burn, redness or tearing)
- Other facial injuries
- Level of consciousness **17**

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT	
<ul style="list-style-type: none"> • Mechanism of injury <ul style="list-style-type: none"> – non-penetrating blunt trauma, penetrating injury, foreign body, chemical injury (identify chemical), use of power tool, hammering metal on metal • Alteration of vision <ul style="list-style-type: none"> – blurring, diplopia, photophobia, floating spots, flashes of light, blindness, cloudy or smoky vision • Pain associated with injury • Pertinent medical history <ul style="list-style-type: none"> – previous eye disorders or injuries, previous eye surgery, use of contact lenses, glasses or prosthesis – other medical history such as diabetes, hypertension, immunisation status 	<ul style="list-style-type: none"> • Physical assessment <ul style="list-style-type: none"> – colour of eye – foreign body, burn, ulcer, subconjunctival haemorrhage – blood or pus in anterior chamber – pupil equality, shape, reactivity – obviously soft or malshaped globe – bloody or clear fluid leakage, presence of tearing – eyelids open/close 	<ul style="list-style-type: none"> • Visual acuity (except with penetrating or chemical injury) <ul style="list-style-type: none"> – perception of light – hand movement – counting fingers – Snellen acuity • Evidence of other associated injuries <ul style="list-style-type: none"> – oedema – laceration/chemical burns of eyelid and surrounding structures – deformity of bony orbit – burns – abnormal eye movements – ecchymosis (bruising)

OTHER EYE EMERGENCIES	
CONDITION	SIGNS AND SYMPTOMS
Acute cerebral aneurysm	Severe head pain, double vision, abnormal eye movement, pupil dilated, neck stiffness
Central retinal artery occlusion	Sudden complete loss of vision, no perception of light, painless
Orbital cellulitis	Pain, inflammation, swelling around eye, may or may not have pus discharging, decreased eye movements
Angle-closure glaucoma	Eye feels rock hard, cornea cloudy, patient usually experiences EXTREME pain, vomiting, mid-dilated pupil
Blow out orbital fracture	In conjunction with significant trauma to face. May be complaining of double vision, numbness to cheek
THESE CONDITIONS ALL REQUIRE URGENT REFERRAL TO AN OPHTHALMOLOGIST	

GOLDEN RULES	TRANSPORT (Penetrating/Perforating Eye Injuries)
<ul style="list-style-type: none"> • Never pad a discharging eye • Never give patient local anaesthetic drops to use at home • Always give an anti-emetic before transporting • PAINFUL RED EYE consider: <ul style="list-style-type: none"> – foreign body – corneal abrasions – acute conjunctivitis – acute keratitis – acute iritis – acute glaucoma • SUDDEN LOSS OF VISION consider: <ul style="list-style-type: none"> – retinal artery occlusion – retinal vein occlusion – vitreous haemorrhage – retinal detachment – optic neuritis 	<p>Ensure smooth transport:</p> <ul style="list-style-type: none"> • For air transport elevate the head 20 degrees • In a pressurised aircraft have cabin pressure at ground level • Give oxygen at 6 litres/minute as retina is very sensitive to hypoxia (altitude = hypoxia) <p>Prior to transport give:</p> <ul style="list-style-type: none"> • Analgesia: Amethocaine Minims (unless contraindicated, eg. penetrating eye injury) 232 • Analgesia as per ANALGESIA REGIMEN 227 • Antiemetic: Metoclopramide 10 mg IM/IV 270 or Prochlorperazine 12.5 mg IM/IV 288 • Antibiotic: Ceftriaxone 1g IM/IV or Vancomycin (consult with Ophthalmologist prior to transport) 238

EYE INJURY (INTERVENTION)

PENETRATING INJURY	BLUNT TRAUMA	CHEMICAL INJURY	FLASH BURNS
<ul style="list-style-type: none"> • Lie patient down (head slightly elevated) to minimise eye movement • Immobilise the object (DO NOT remove it) • Apply shield over affected eye if possible • Do not apply pressure (ie. pad eye) • DO NOT instil drops or ointment • Provide reassurance 	<ul style="list-style-type: none"> • Instil local anaesthetic (AMETHOCAINE MINIMS) 232 • Check visual acuity • Apply eye shield • Place patient in comfortable position 	<ul style="list-style-type: none"> • Instil local anaesthetic: (AMETHOCAINE MINIMS) 232 • IRRIGATE <ul style="list-style-type: none"> – use copious amount of normal saline (litres) (or water if saline not available) – place patient supine and turn head to affected side – encourage intermittent blinking – irrigate under lids • Check visual acuity (after irrigating eye) • Apply eye pad 	<ul style="list-style-type: none"> • Instil local anaesthetic (AMETHOCAINE MINIMS) 232 • Check visual acuity • Apply eye pad • Analgesia as per ANALGESIA REGIMEN 227
TRANSFER TO HOSPITAL / discuss with ophthalmologist			

HEAD INJURY (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

EARLY SIGNS OF HEAD INJURY	LATE SIGNS OF HEAD INJURY
<ul style="list-style-type: none"> • Headache • Nausea and vomiting • Amnesia • Altered level of consciousness 17 • Changes in speech, drowsiness, agitation, restlessness and / or loss of judgement 	<ul style="list-style-type: none"> • Hypertension • Bradycardia • Irregular respiration • Dilated, non-reactive pupil • Unresponsiveness • Abnormal posturing

POTENTIAL SIGNS AND SYMPTOMS OF SPECIFIC HEAD TRAUMA				
FRACTURED BASE OF SKULL	DEPRESSED SKULL FRACTURE	EXTRADURAL HAEMATOMA	SUBDURAL HAEMATOMA	CONCUSSION (Retrospective diagnosis)
<ul style="list-style-type: none"> • Otorrhoea, rhinorrhoea • Haemotympanum or bloody drainage from ear • Raccoon Eyes: bilateral periorbital bruising in absence of facial trauma (late sign) • Battle sign: mastoid bruising (late sign) 	<ul style="list-style-type: none"> • Signs and symptoms determined by amount of brain damage • Injury may result in cerebral oedema, decreased level of consciousness, dilated pupil on side of injury, weakness on opposite side • Fitting 	<ul style="list-style-type: none"> • Brief loss of consciousness followed by lucid period • Severe vomiting, headache • Rapid physical deterioration with decreased level of consciousness • Dilated pupil on side of haematoma • Weakness on opposite side 	<ul style="list-style-type: none"> • Altered level of consciousness, headache, personality changes • Dilated pupil on side of haematoma • Weakness on opposite side 	<ul style="list-style-type: none"> • Transient loss of consciousness, memory loss • Nausea, vomiting, dizziness, headache

HEAD INJURY (INTERVENTION)**IMMOBILISE CERVICAL SPINE**

SERIOUSLY INJURED UNCONSCIOUS ON PRESENTATION	SIGNIFICANTLY INJURED CONSCIOUS/SEMI-CONSCIOUS ON PRESENTATION	MINOR HEAD INJURY SHORT LOSS OF CONSCIOUSNESS
<ul style="list-style-type: none"> • Glasgow Coma Scale 17 • Clear airway (do not move neck unduly) • Insert airway (oropharyngeal) • Give oxygen at 12 litres/minute (may need to use Oxyviva) • Vital signs every 15 minutes • Establish IV access 206 • Insert urinary catheter (monitor output) • Insert orogastric tube (nasogastric contraindicated) • Control seizures with Diazepam IV or Midazolam IV 243 274 243 274 (SEIZURES 143 165) <ul style="list-style-type: none"> – repeat if seizure persists, may give medication rectally if no IV • Examine scalp for lacerations, fractures • Nil by mouth 	<ul style="list-style-type: none"> • Glasgow Coma Scale 17 • Maintain airway • Give oxygen at 12 litres/minute • Vital signs every 15 minutes • Establish IV access 206 • Nil by mouth 	<ul style="list-style-type: none"> • Glasgow Coma Scale 17 • Check for associated injuries • Vital signs • Half-hourly neurological observations for minimum 4 hours (discuss with medical staff) • Consult with doctor regarding need for transfer to hospital • Nil by mouth
TRANSFER TO HOSPITAL		

LIMB INJURY (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**
 Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- | | |
|---|---|
| <ul style="list-style-type: none"> • Note position of limb (any obvious deformities, swelling) • Compare injured limb with other side | <ul style="list-style-type: none"> • Conduct thorough neurovascular assessment of affected limb <ul style="list-style-type: none"> – upper extremity (brachial, radial, ulnar pulses) 21 – lower extremity (femoral, popliteal, posterior tibial, dorsalis pedis pulses) |
|---|---|

SUBJECTIVE ASSESSMENT

- History of injury (TRAUMA ASSESSMENT) **176**
 - mechanism and circumstances surrounding injury, time it occurred
 - measures taken to relieve pain/swelling, (ie. splinting, pain relief, ice)
 - ability to weight-bear
 - swelling: immediate, delayed, absent
 - factors that increase or decrease pain
- Past medical history
- If paediatric patient, and patient or family cannot give adequate explanation of mechanism of injury, consider possibility of child abuse
- Be alert to possibility of hip/pelvic fractures in elderly female patients who have even minor falls

OBJECTIVE ASSESSMENT

- Point of tenderness/pain
- Mobility
 - Can patient move extremity?
 - flexion, extension
 - abduction, adduction
 - rotation
- Check also for circulation, warmth, sensation and pulses distal to the injury, comparing always with the uninjured side
 - appearance
 - deformity/dislocation
- With fractures, crepitus may be felt and heard

LIMB INJURY (INTERVENTION)

IN ALL CASES

- Apply direct pressure to stop external bleeding
- Do not use tourniquets, clamps
- Oxygen at 12 litres/minute
- Establish IV access if associated trunk injury or pain/deformity of pelvis or thigh or IV analgesia required **206**
- Treat as for haemorrhagic SHOCK if significant blood loss **170**
- Examine injured limb - remove splint to inspect surface (cut off/remove clothes)
- Confirm distal pulse and integrity of nerve supply (NEUROVASCULAR ASSESSMENT) **21**
- Apply simple sterile dressing to wounds
- Examine the rest of the patient
- Analgesia as per ANALGESIA REGIMEN **227**
- Splint fractures **211**

BEWARE OF COMPARTMENT SYNDROME

- Tense compartment over/around fracture (rigid to touch)
 - Reduced sensation distal to the fracture
 - Pain is out of proportion to injury
 - Pain on passively stretching muscle within the compartment
- The patient needs URGENT SURGICAL DECOMPRESSION (within hours)

COMPOUND FRACTURES

Adapted from Primary Clinical Care Manual Queensland Health (2003) with permission from North Queensland Health Rural Health Training Unit.

- As above
- Do not suture any wounds
- Clean wounds by irrigating with copious normal saline, and cover with normal saline soaked dressing **296**

- Check tetanus status
- X-ray if available to confirm fracture
- IV fluids (Normal Saline or Hartmann's) **296 240**
- IV antibiotics as advised by doctor

TRANSFER TO HOSPITAL

LOWER EXTREMITIES

	SIGNS AND SYMPTOMS	INTERVENTION
FRACTURED FEMUR	<ul style="list-style-type: none"> • Deformity, local swelling, point tenderness, variable degrees of extremity shortening and external rotation • Inability to weight-bear 	<ul style="list-style-type: none"> • Immobilise – Hare/Donway traction best for air transport (RFDS can bring)
FRACTURED PATELLA	<ul style="list-style-type: none"> • Severe pain, point tenderness, inability to walk, swelling, inability to straighten leg 	<ul style="list-style-type: none"> • Avoid manipulation • Apply cold packs • Rest patient in supine position
FRACTURED TIBIA/FIBULA	<ul style="list-style-type: none"> • Severe pain, inability to dorsiflex foot, capillary return to toes may be diminished 	<ul style="list-style-type: none"> • Immobilise eg. POP back slab • Elevate
FRACTURED ANKLE	<ul style="list-style-type: none"> • Immediate pain, swelling, immobility, unable to weight-bear, point tenderness, deformity 	<ul style="list-style-type: none"> • Immobilise and elevate • Cold packs
TRANSFER TO HOSPITAL		

FRACTURED PELVIS

Adapted from Primary Clinical Care Manual, Queensland Health (2003) with permission from North Queensland Health Rural Health Training Unit.

SIGNS AND SYMPTOMS	INTERVENTION
<ul style="list-style-type: none"> • Pain around the hips, especially on moving, or when pressing the bony parts of the hips and groin • Abdominal pain and tenderness • Hypotension/SHOCK 170 • Blood at urethral meatus or haematuria 	<ul style="list-style-type: none"> • Give oxygen at 12 litres/minute via Hudson mask/non-rebreather mask 210 • Insert large bore IV cannula (14g if possible otherwise 16g) 206 • Give Normal saline or Hartmann's to keep vein open unless HYPOVOLAEMIC 296 240 170 • Analgesia as per ANALGESIA REGIMEN 227 • Catheterise as long as no blood at urethral opening and no perineal bruising • Nil by mouth • If shocked use M.A.S.T. suit if available 170
TRANSFER TO HOSPITAL	

UPPER EXTREMITIES

		SIGNS AND SYMPTOMS	INTERVENTION
DISLOCATED SHOULDER	<ul style="list-style-type: none"> Characterised by severe pain, inability to move joint and deformity 	<ul style="list-style-type: none"> Immobilise shoulder Pain relief 	
FRACTURED CLAVICLE	<ul style="list-style-type: none"> Common childhood fracture usually caused by fall on outstretched hand. Patient often holding injured arm with unaffected arm 	<ul style="list-style-type: none"> Apply broad arm SLING (not collar and cuff) 211 	
FRACTURED HUMERUS	<ul style="list-style-type: none"> Patient has pain and is unable to move arm Nerve damage may be evidenced by numbness of thumb and inability to raise hand at wrist 	<ul style="list-style-type: none"> Apply broad arm SLING or collar and cuff (whichever is most comfortable for the patient) 211 	
FRACTURED WRIST	<ul style="list-style-type: none"> Point tenderness, pain, swelling, +/- deformity 	<ul style="list-style-type: none"> Immobilise in POP backslab Elevate in high arm SLING 211 	
FRACTURED ELBOW	<ul style="list-style-type: none"> Inability to perform spontaneous movement of elbow Arterial vascular compromise, cold dusky hand and forearm with loss of sensation 	<ul style="list-style-type: none"> Apply sling and / or posterior splint with medial and lateral gutter SPLINTS 211 Pain relief Transfer to hospital if any evidence of nerve or NEUROVASCULAR INJURY 21 	

SPINAL INJURY (FOCUSSED ASSESSMENT)

Conduct RAPID PRIMARY ASSESSMENT **14** INITIAL ASSESSMENT **16** and TRAUMA ASSESSMENT. **176**

Carry out Basic Life Support if required. **28** Follow Medical Consultation flowchart. **4**

KEY ASSESSMENT POINTS

- Respiratory status, observe for diaphragmatic breathing
- Movement of extremities

SUBJECTIVE ASSESSMENT	OBJECTIVE ASSESSMENT
<p>HISTORY</p> <ul style="list-style-type: none"> • Mechanism of injury reported by patient or witnesses <ul style="list-style-type: none"> – suspect cervical spine injury with any trauma above clavicle, head injury, diving accident, hanging, coma, high-speed accident – suspect other spinal injury when landing from height on feet, hyperextension injury or fall above 3m • Extent of movement and sensation after injury • Method of immobilisation at scene (ie. by witnesses, ambulance personnel) • Any past injuries to spinal column and residual deficits <p>ASSOCIATED SYMPTOMS</p> <ul style="list-style-type: none"> • Complaints of pain along spinal column, with/without palpation • Numbness or tingling of extremities <p>(NOTE presence or absence of cervical pain is a reliable indicator only in the alert patient. Always consider spinal injury in the traumatised, unconscious, or intoxicated patient, or when the mechanism of injury is consistent with potential spinal injury)</p>	<ul style="list-style-type: none"> • Vital signs <ul style="list-style-type: none"> – hypotension and bradycardia may be present – observe respirations as paralysis of the intercostal muscles may occur with cervical and upper thoracic injury – temperature • Mental status • NEUROVASCULAR STATUS 17 <ul style="list-style-type: none"> – ability to move extremities; deficits occur at and distal to the level of injury 21 – loss of sensation (sensory level) • Spinal cord injury may be manifested by: <ul style="list-style-type: none"> – absence of anal sphincter tone (PR examination) – loss urinary retention – loss of sweating reflex – loss of vasomotor tone – hypotension – decreased sensation, tingling or pain in neck or back • Obvious spinal deformity • Abnormal, prolonged penile erection is indicative of severe spinal cord injury

SPINAL INJURY (INTERVENTION)

NOTE: Patients with spinal injuries lose the ability to regulate their body temperature, so use measures to maintain their temperature at 36.6°-37°C. Keep patient warm using space blanket and other warm blankets.

PATENT AIRWAY

Provide supplementary high-flow oxygen

IMMOBILISE SPINE

- If suspected cervical injury apply cervical collar (firm one if available)
- Nurse flat on back on a hard surface. Maintain head in neutral position using sandbags/collar and ensure neck is in alignment with body
- If you need to move patient (eg. if vomiting) log roll with at least 3 people (do not roll with less)
DO NOT move patient unnecessarily
- Remove clothing (use scissors if necessary) for head-to-toe assessment to check for any other injuries
- GLASGOW COMA SCALE and vital signs every 15 minutes **17**
- Establish IV access **206**
- Insert urinary catheter (careful aseptic technique)
- Reassure patient and give instructions not to move head/body
- Protect pressure areas
- If BP below 85mmHg systolic commence Gelofusine® **249** 250 mL over 15 minutes (DO NOT overload these patients)
- Analgesia and antiemetic as per ANALGESIA REGIMEN **227**
- Insert nasogastric tube (orogastric if suspected base of skull fracture)

TRANSFER TO HOSPITAL

AIRWAY OBSTRUCTION

- Insert airway (EXTREME CARE must be taken not to hyper-extend the neck)
- Ventilate with bag/mask with oxygen at 12 litres/minute if no spontaneous or adequate respiration
- Suction carefully

TRIAGE AT MULTIPLE ACCIDENT

In the absence of medical assistance, use your professional judgement when decisions need to be made which are related to available resources and the site of the accident

REMEMBER THE EMERGENCY ACTION PLAN:

Danger	Danger, (avoid becoming a casualty yourself)
Response	Assess response from casualty to determine if unconsciousness. An unconscious casualty becomes a priority
Airway	Check the airway. Clear and open the airway if necessary
Breathing	Check breathing. If breathing absent, support E.A.R.
Circulation	Check pulse. If no pulse, consider CPR. Check for any external bleeding and control it

ALWAYS ACT TO	PRIORITIES	DELEGATE (to appropriate onlooker)
Preserve life (including your own) <ul style="list-style-type: none"> Prevent further harm Reduce pain and shock Give calm, clear instructions 	<ul style="list-style-type: none"> Evacuation from accident site Management of conditions which have caused or lead to shock and airway compromise <ul style="list-style-type: none"> maintain patent airway control bleeding watch for shock, cyanosis and deteriorating conditions 170 	<ul style="list-style-type: none"> Recording of personal details of ALL casualties First aid of minor injuries Liaison with RFDS and medical assistance to bring them to site of accident

THE ACCIDENT SCENE

1. Secure the scene	(Ensure that the area is safe. Traffic should be directed around the scene or if necessary completely stopped)
2. Establish a command and control area	(All communication should be directed to the scene controller)
3. Establish a casualty clearing area	(Once casualties have been assessed and extricated they should be moved to a central treatment and clearing area)
4. Ensure that adequate entry and exit is available for arriving and departing emergency vehicles	

CASUALTY GROUPS	ACTIONS		
	DO NOT become involved in treatment of an individual patient until all patients have been assessed and treated for airway obstruction and bleeding		
1. Minor injuries not requiring hospitalisation (eg. cuts, bruises)	FIRST AID TREATMENT Register personal details Ask to leave accident site (with friend/support if possible)		
2. Injuries requiring treatment but not hospitalisation (eg. sprains, large bruising, back strain)	AS FOR MINOR INJURY (above) Instruct to see own doctor or nearest health centre		
3. Injuries requiring early transfer/evacuation <ul style="list-style-type: none"> • Basic Life Support 28 • Prioritise order of evacuation 	PRIORITY 1 Casualties with: asphyxia, 'severe' head injuries, deteriorating level of consciousness, multiple injuries, burns of more than 30%	PRIORITY 2 Casualties requiring urgent surgery, unconscious and deteriorating, abdominal injuries, large wounds with bleeding controlled, burns of 10-30%, dislocation of joints	PRIORITY 3 Casualties requiring non-urgent surgery, closed fractures, facial injuries (not obstructing airway), minor wounds, burns less than 10%
4. Clinically dead or likely to die before reaching hospital even if immediately evacuated (eg. critical CNS or respiratory system or multiple injuries)	EVACUATE LAST NOTE: lives of those with a chance of survival may be jeopardised by using the limited resources on those with no chance of survival		

Section Four:

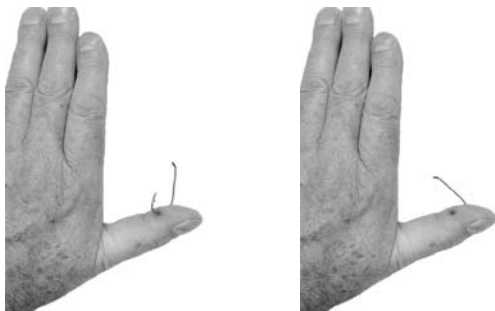
Procedures and Other Information

FISH HOOKS (REMOVAL OF)

Adapted with permission from Australian First Aid, St John Ambulance Australia, 2003.

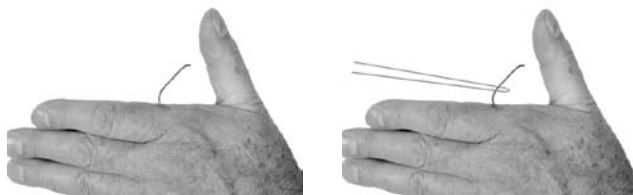
Method 1.

If the BARB IS PROTRUDING.
Cut it off and withdraw the hook



Method 2.

If the BARB IS EMBEDDED.
Loop fishing line along curve



Press down on the shank of the hook with thumb of other hand and pull the hook straight out.



- Large hooks require surgical intervention so contact the doctor
- Local anaesthesia may be required if the hook is awkwardly placed **268**
- Check tetanus immunisation status

HELMET REMOVAL

Adapted with permission from Australian First Aid, St John Ambulance Australia, 2003

Two people should perform removal of helmets

1. Place the casualty on back, supporting the head (protect the cervical spine – avoid moving head up, down or to the side)
2. Unfasten the chin strap (cut it if necessary)

OPEN FACE HELMETS (Figure A)



Figure A

3. Pull sides of helmet apart to take pressure away from casualty's head. Have someone support casualty's neck if possible
4. Gently lift helmet back and up off head

FULL FACE HELMETS

3. Gently insert your fingers under rim, while supporting the neck and holding jaw firmly (Figure B)
4. A second rescuer should tilt helmet backwards, lifting front to clear chin
5. Tilt helmet forward to clear base of skull and lift helmet off (Figure C)



Figure B



Figure C

INTRASOSEOUS INFUSION

INDICATIONS

Life-threatening dehydration or shock when it has not been possible to establish an IV line

CONTRA-INDICATION

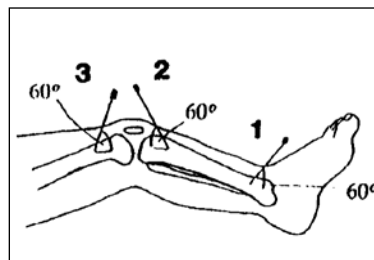
Do not put into an injured limb or through burnt or infected tissue

MATERIALS

- Dressing tray and skin prep
- Intraosseous infusion needle or wide bore (18 g) needle with stylet
- IV giving set and IV fluid (normal saline) **296**
- 3-way tap and 50 mL syringe
- Assistant who understands the procedure
- Sterile gloves

TECHNIQUE

1. Explain the procedure to patient/relatives
2. Set up fluid and giving set as for IV infusion. Drip rate.
 - If patient is shocked, give normal saline or Gelofusine®, 20 mL/kg stat. If 10 minutes after the first bolus is finished, the child is still shocked, give another 10 mL/kg stat. **296 249**
 - Once stabilised put up Hartmann's 1 litre and run at 5 mL/kg/hour **240**
 - Use a burette to calculate small fluid doses. Or for very small amounts of fluid, use a 50 mL syringe attached to the 3-way tap. This makes pushing the fluid in easier.
3. Choose the site:
First choice: Distal tibia on the medial flat surface 2 to 3 cm above the medial malleolus. Angle the needle 60 degrees upwards



Second choice: Proximal tibia on the medial flat surface 2-3 cm below the tibial tuberosity. Angle the needle 60 degrees downwards

Third choice: Distal femur on the front of the thigh, 3 cm above the top of the patella in the midline. Angle the needle 60 degrees upwards

4. Use strict aseptic technique (thoroughly clean the site with soap and water and then iodine unless patient allergic to iodine)
5. If patient conscious, use 1 mL 1% Lignocaine to infiltrate skin and nick skin with scalpel blade before inserting needle **268**
6. Restrain the leg (but do not place hand beneath the bone to be accessed) and push in the needle using a screwing motion. You should feel a loss of resistance as you go through the cortex and enter the marrow space

You may be able to aspirate blood or marrow to confirm you are in. Otherwise the easy injection of 5 mL of normal saline will confirm **296**
7. Attach IV giving set and turn on; run at the same rate as an intravenous infusion. The flow rate may be slow at the start, if so, try flushing with 5-10 mL of saline. Soft tissue around the bone should be carefully and frequently observed for extravasation of fluid or medications
8. If one site does not work, try another. Leaking of fluid may occur from the holes of previous attempts but can be stopped with local pressure

INTRAVENOUS CANNULATION

1. Select intravenous site
 - apply venous tourniquet to upper arm
 - instruct patient to open and close fist to distend veins
 - select palpable vein on dorsum of hand or forearm
 - preserve more proximal veins for later use
 - try to avoid veins at joints and sites of movement
 2. Prepare skin
 - use non-touch technique on clean skin
 3. Technique for insertion of cannula
 - select cannula size appropriate for available vein and patient's condition (ie. if shocked use 14g or 16g for an adult, or 22g to 24g for a child)
 - remember blood cannot be infused through cannula smaller than 18g
 - check that plastic cannula slides easily over stylette
 4. Stabilise vein in subcutaneous tissue
 - apply traction to skin with thumb of your non-dominant hand
 5. Puncture skin
 - slide the skin to one side of vein to avoid puncturing vein
 - insert cannula at a 15 degree angle through skin
 6. Puncture vein
 - advance stylette and cannula as a unit until vein is punctured
 - identify vein entry by free back-flow of blood
 - advance stylette and cannula 5 mm into vein
 7. Advance cannula into vein
 - hold hub of needle with the thumb and finger and slide catheter over the stylette into the vein
 8. Remove the stylette
 - free back-flow of blood indicates satisfactory intravenous position
 - apply pressure over vein and cannula tip to control bleeding
 - if cannula fails to enter the vein, do not attempt to reinsert the stylette into in situ cannula; remove entire device, start again and apply pressure to puncture site
 9. Release tourniquet
 10. Attach intravenous line or bung
 - check patency, ie. if line is open
 - if IV line, commence fluid
 - if bung, flush with 5mL normal saline **296**
 11. Apply tape and/or clear plastic dressing
 12. Check IV site every 8 hours for
 - leakage, phlebitis and swelling
- Note: All bungs require 6-hourly flushes with 5 mL normal saline to maintain patency **296**

FOR BABY

Shave area over scalp vein to be used, put large flat rubber band around head, over the eyebrows, as tourniquet and insert 25G butterfly into vein; secure the needle, remove rubber band and commence infusion

NEEDLE CRICOTHYROIDOTOMY

Reproduced from the Primary Clinical Care Manual (2003), Queensland Health with permission from the North Queensland Rural Health Training Unit.

NEEDLE CRICOTHYROIDOTOMY IS A TEMPORARY MEASURE ONLY

1. Assemble and prepare oxygen tubing by attaching a 'Y' connector to one end, or if you have no 'Y' connector, cut a hole in the oxygen tube near one end, and connect the other end to the oxygen supply (if no oxygen see next page)
2. Lie patient flat with neck extended over pillow and stand at the side of the patient
3. Attach a 12g or 14g IV cannula to a 5 or 10mL syringe
4. Find the cricothyroid membrane (see Figure A [208](#))
 - Put your finger just underneath the middle of the chin bone (mandible) and move your finger slowly down the front of the neck from the chin; the first hard edge met is the top of the thyroid cartilage
 - Move on slowly down this hard cartilage (1 to 3 cm); you will feel a space/gap followed by another hard edge – the top edge of the cricoid cartilage
5. Clean the area with Chlorhexidine solution, iodine, or alcohol swabs
6. Stabilise the trachea with the thumb and forefinger of one hand to prevent lateral movement of the trachea during the procedure
7. Insert the cannula vertically into the skin
 - When there is a 'give', aspirate with the syringe
 - If no air comes out you have not gone deep enough, so continue inserting
8. When air aspirates freely, swing the syringe 45 degrees towards the head so that the cannula is pointing more towards the lungs (see Figure B [208](#))
9. Hold the syringe very still and advance the cannula gently over the needle down towards the lungs. Withdraw the needle and syringe completely
10. Attach the end of the cannula to the oxygen tube prepared as above (see Figure C [208](#))
 - Turn on the oxygen to 12 litres/minute for adult
 - For children start at 1 litre/year/minute
11. Allow oxygen to flow into patient for one second and let chest recoil for 4 seconds. That is:
 - Block open end of 'Y' connector with finger for one second, and leave it open for 4 seconds or
 - Block hole made in tube with finger for one second and leave open for 4 seconds
 - Maintain this rhythm of 1 second/4 seconds until doctor takes over

Figure A

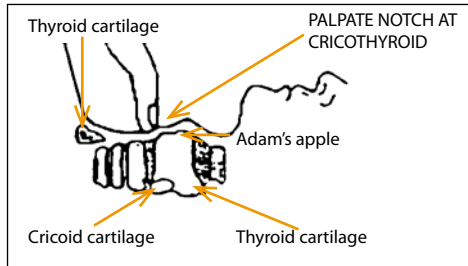


Figure B

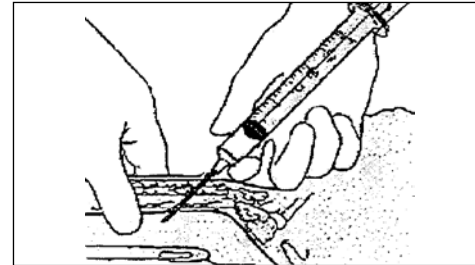
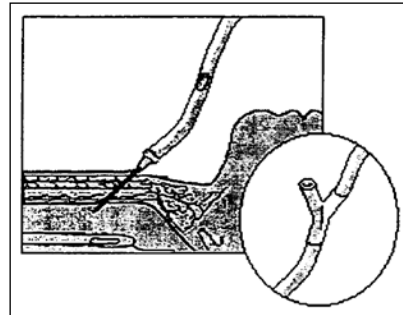


Figure C



If you have NO OXYGEN SOURCE, attach a 5 mL syringe (with the plunger removed) to the cannula and commence mouth to syringe breathing.

NEEDLE THORACOCENTESIS

INDICATIONS

Suspected TENSION PNEUMOTHORAX **186**

METHOD

1. Give oxygen 12 litres/minute (via a non-rebreathing bag if available **210**)
2. Insert a short (1¼) 16 gauge IV cannula into the chest just below the clavicle, in line with the nipple, in the 2nd intercostal space mid-clavicular line as in Figure A.
 - The cannula should be inserted along the upper edge of the rib as illustrated in Figure B. You will feel a loss of resistance when the pleural space is accessed

NOTE: It is normally necessary in an adult to push the cannula ALL the way in. Even if the patient does not have a pneumothorax, damage to the underlying lung only occurs rarely, and is minimal

 - If there is a tension pneumothorax, there will be a rush of air out with some relief being experienced by the patient. Remove the stylet, secure the cannula with tape, and leave in situ. Contact the doctor for further instructions
 - If air does not rush out, simply remove the cannula

Figure A

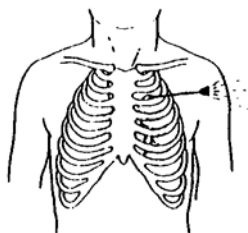
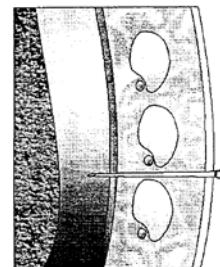


Figure B

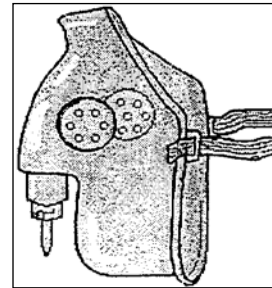


OXYGEN DELIVERY SYSTEMS

Adapted from Primary Clinical Care Manual, Queensland Health (2003) with permission from the North Queensland Rural Health Training Unit.

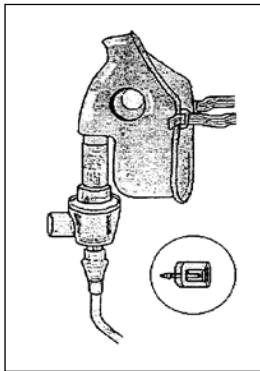
NASAL CANNULA

- Flow rate of 2 litres/minute delivers 28% inspired oxygen concentration
- Flow rate of 4 litres/minute delivers 36% inspired oxygen concentration



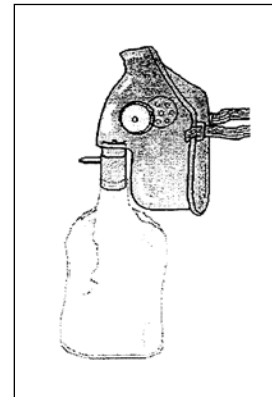
HUDSON MASK

- Flow rate of 5-6 litres/minute delivers 40% inspired oxygen concentration
- Flow rate of 7-8 litres/minute delivers 60% inspired oxygen concentration
- < 4 litres/minute not recommended
- > 10 litres/minute does not increase % delivered



VENTURI MASK

- Delivers 24%, 28%, 35%, 40%, or 50% inspired oxygen concentration according to % selected
- Must also be at recommended flow rate



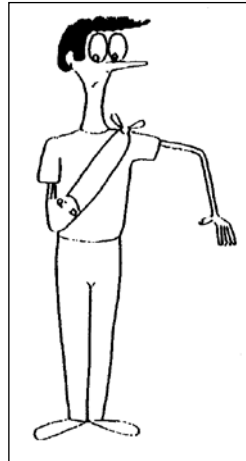
NON REBREATHING MASK

- Flow rate of 14 litres/minute delivers 85-90% inspired oxygen concentration
- % delivered depends on quality of seal
- Also ensure reservoir bag is full prior to attaching to the patient

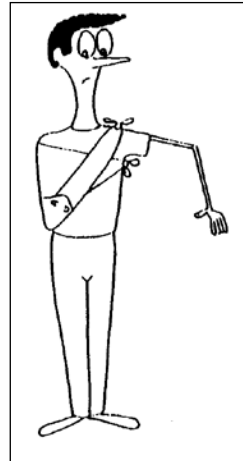
SPLINTING FRACTURES

Diagrams reprinted with permission from St John Ambulance Australia. Canberra, Australia.

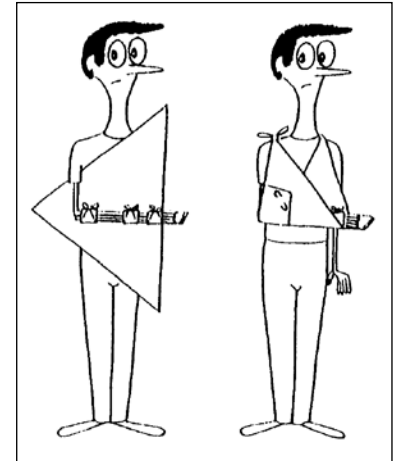
1. High arm sling
(# wrist, # humerus)



2. Collar and cuff with splinting
(immobilise # humerus for transport)



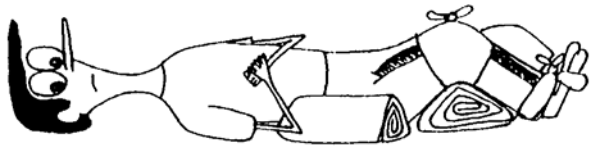
3. Broad arm sling or triangle
(bruised forearm, dislocated shoulder, # clavicle)



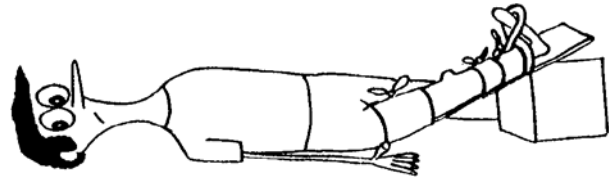
HELPFUL HINTS:

- Splint according to patient's comfort
- Different patients may tolerate different types of slings or positions
- Foam under knots will increase patient comfort

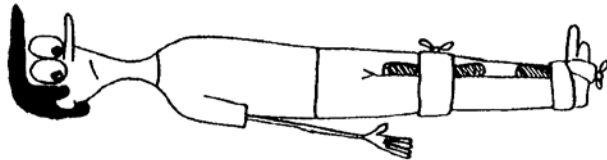
4. # Pelvis



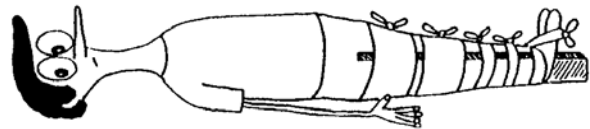
6. # Knee-cap



5. # Lower leg



7. # Lower leg prepared for transport



REMEMBER TO CHECK CIRCULATION BELOW THE BANDAGE
Ensure NEUROVASCULAR ASSESSMENT is done **21**

SUDDEN DEATH IN A COMMUNITY

PROCEDURE

- First, be completely satisfied yourself that the person is deceased
- DEATH IS CONFIRMED BY:
 - persistent absence of carotid pulse and heart sounds
 - persistent absence of signs of perspiration
 - persistent absence of pupillary responses
- Inform the doctor and/or the Coroner/Police as appropriate (see CERTIFICATION OF DEATH section 214)
- Document all details relating to emergency interventions, time of death and possible cause and circumstances surrounding death
Inform relatives and community members
- Encourage culturally appropriate expressions of grief and ritual without jeopardising legal processes or requirements
- Continue to work in close consultation with relatives and community leaders 10

TRANSPORT OF BODIES

- Bodies for Post Mortem examination (Coroner's case)
 - Police will arrange transport and the cost of transport. Final burial charges will be the responsibility of the community
- Bodies not subject to Coronial Inquiry procedure
 - Transport and funeral arrangements and associated costs are the responsibility of the community
Circumstances relating to cultural beliefs and grieving may dictate that the nurse assists in the practical agreements
- As a general rule:
 - Bodies should not be transported in health department vehicles
 - RFDS should not transport bodies. The final decision rests with RFDS and would be subject to the particular circumstances

CERTIFICATION OF DEATH

DEATHS TO BE CERTIFIED BY THE DOCTOR	DEATHS REPORTABLE TO CORONER
<ul style="list-style-type: none"> • The DOCTOR has responsibility to: <ul style="list-style-type: none"> - confirm that death has taken place - confirm that the death is not reportable to a Coroner - issue a death certificate if the death is not reportable to the Coroner - report death to the Coroner if unable to issue a death certificate • The DOCTOR has a statutory obligation to: <ul style="list-style-type: none"> - accurately and completely fill out the details required on every part of the Standard Death Certificate concerning the death of a person aged 28 days or over. The nurse may assist by providing noted information for the doctor • The doctor may be prepared to sign the death certificate on the strength of information provided by the nurse by telephone. This would be if: <ul style="list-style-type: none"> - the cause of death is believed to be the direct result of a known chronic and/or life threatening condition and - the doctor is unable to travel to the community to personally assess the body but has current knowledge of the person's medical history 	<p>The Police or Coroner must be notified immediately in the case of:</p> <ul style="list-style-type: none"> • Any sudden death • Any death of a person in custody or on home detention • Any death where the cause of death is uncertain • Any death which is associated with any of the following: <ul style="list-style-type: none"> - suspicion of homicide (violence or poisoning) or suicide - suspicion of negligent act or omission of any person - accident - road traffic, domestic, industrial, drowning - recent surgical procedure - abortion - allegation of medical negligence - all maternal or child deaths
<p>In Coroner's cases, all devices such as intravenous lines and nasogastric tubes should be left in situ. In the case of suspected homicide, it is important that the body remains in the position it was found until the Police have been contacted. Have the area cordoned off until the Police arrive to investigate. IF THERE IS ANY DOUBT AS TO WHETHER OR NOT A CASE SHOULD BE REPORTED, THE ADVICE OF THE CORONER/POLICE SHOULD BE SOUGHT.</p>	

WHAT TO TAKE TO AN ACCIDENT

RURAL EMERGENCY RESUSCITATION KIT (PARRY PAK)

An Emergency Resuscitation Kit has been designed and developed for use in all rural Western Australia public hospitals and nursing posts, under the direction of Dr John Parry and through wide consultation with health professionals. One such kit has been supplied to each site for use both on-site and to carry to off-site emergencies. The purpose of the kit is to provide a basic standard set of equipment and drugs with the main emphasis on the basics of resuscitation – airway management and circulatory support. The bag contains a variety of removable transparent sections.

YOU SHOULD BE FAMILIAR WITH THE CONTENTS OF THE PARRY PAK AND HOW TO USE THEM BEFORE YOU NEED TO USE THEM

- Check the contents of the pack regularly and restock after use
- It is recommended that all components be maintained in the standard format to enable you to quickly locate things in an emergency
- You can replenish stocks for the pack from AMA Sales, Perth (08) 9273 3000

EMERGENCY KIT EQUIPMENT LIST

ITEM	ITEM
<p>Front Pouch 2 x Hartmann's (500 mL) Heavy duty scissors 1 x space blanket</p> <p>Back Pouch 2X Gelofusine® Solution 500 mL 2 IV giving sets with hand pump and injection port</p> <p>Left Side Opening</p> <p>3A – Nasogastric tubes 14G x 2, 10G x 2 – Sachet of lubricant – 1 drainage bag</p> <p>3B – 4 x large combine dressings (20 x 20 cm)</p> <p>3C – Adhesive tape (2.5 cm) – Waterproof adhesive tape (sleek) – Safety pins assorted sizes</p> <p>3D – IV cannulae with non-retractable needles – 4 x: 14 G x 2" 16 G x 1 ¼" 18 G x 1 ¼" 20 G x 1 ¼" 22 G x 1" 24 G x ¾" – 4 x Needle-free injection ports (bungs) – 20 alcohol wipes – Scalp vein needles: 2 x 21 G 2 x 25 G</p>	<p>3E – Adult face mask – Paediatric face mask – Face mask with nebuliser attachment</p> <p>3F – 2 x sterile cord clamps – Gloves non-sterile (medium/large) – Small antiseptic hand lotion</p> <p>3G – 4 x heavy crepe bandages</p> <p>Right Side Opening</p> <p>4A – Not used</p> <p>4B – Laryngoscope handle (plastic) – Laryngoscope blades (plastic) large medium neonatal</p> <p>– Magill's forceps – adult and paediatric – Disposable flexible connector or licorice stick – Cloth tape</p> <p>4C – 1 x emergency Pneumothorax set – Intraosseous needle</p> <p>4D – Stethoscope – 1 x LED headlamp</p> <p>5 Long Pouch – Yankauer sucker – Y-suction catheters 2 x 8 G 2 x 12 G 2 x 14 G – Urinary catheters (Foley) 14 G</p>

Continued next page . . .

EMERGENCY KIT EQUIPMENT LIST CONTINUED . . .

ITEM	ITEM
<ul style="list-style-type: none"> - Anaesthetic lubricant syringe, Lignocaine Jelly 6 Large Side Pouch - Disposable sterile drape, poly lined - Sterile instruments <ul style="list-style-type: none"> dissecting forceps needle holders crile curved artery forceps fine vein scissors suture scissors - Disposable scalpels No 11 and No 23 - Suture material, 3/0 silk, 2/0 plain gut and 0 silk 7 Small Side Pouch - Syringe 2 x 20 ml, 3 x 10 ml, 3 x 5 ml, 3 x 1 ml - Needles 3 x 18 G, 3 x 21 G, 3 x 25 G 8 Large Bottom Pouch - Sharps container - Pack of wet ones - Introducer stylets, adult and infant sizes - 1 x small and 1 x large tracheostomy tubes 9 Sphygmomanometer 10 Laerdal Resuscitator - Adult self-inflating bag and valve assembly with reservoir and connection for supplemental oxygen - Resuscitation masks 5, 3 and 1 - Neonatal masks - infant and premature - Guedel airways 3, 2, 1, 0 	<ul style="list-style-type: none"> 11 Loose Objects - ET Tubes, cuffed, sizes 7, 8, 9 - ET Tubes, uncuffed, sizes 3, 4, 5, 6 neonatal ET 2.5 cm - 2x cubital fossa splints - Urinary drainage bag 12 Stationery – Both Outer Zip Pockets - Surgical marking pen, blue clipboard with A4 bank pad, 5 x history cards, local stationery, 5 x triage cards, 2 x ball point pens, pencil Ground sheet x 1 - Neck brace/collar - adult and paediatric Drug Tray (See attached list) 14 Oxyviva (Or portable oxygen and suction) Oxygen tubing (5 metres) Recommended But Not Mandatory IV access kit Lightweight intubation kit First Aid Backpack IV access kit First Aid Backpack Endotracheal kit

DRUG LIST FOR EMERGENCY KIT

DRUG/IV FLUID	STRENGTH	VOLUME	QUANTITY
Adrenaline	1 mg	1 mL	5
Adrenaline	1 mg	10 mL	1
Aspirin	300 mg		Box
Atropine	0.6 mcg	1 mL	1
Ceftriaxone	1 g	1	
Diazepam	10 mg	2 mL	5
Frusemide	20 mg	2 mL	5
Glucose	50%	50 mL	1
GTN Nitrolingual spray	400 mcg per 1 spray	14.7 mL	1
Gelofusine®		500 mL	2
Haloperidol	5 mg	1 mL	5
Hartmann's		500 mL	2
Hydrocortisone	100 mg	2 mL	1
Isosorbide Dinitrate	5 mg	Tabts	100
Lignocaine	2%	5 mL	5
Metoclopramide	10 mg	2 mL	5
Metoprolol	1 mg	1 mL	1

DRUG/IV FLUID	STRENGTH	VOLUME	QUANTITY
Midazolam	5 mg	5 mL	5
Morphine	10 mg	1 mL	5
Naloxone	400 mcg	1 mL	1
Oxytocin and Ergometrine		1 mL	5
Paracetamol	500 mg	Tabts	12
Pethidine	100 mg	2 mL	5
Promethazine	50 mg	2 mL	5
Salbutamol	500 mcg	1 mL	5
Salbutamol	5 mg/mL	30 mL	1
Salbutamol		Inhaler	1
Sodium Bicarbonate	8.40%	50 mL	1
Sodium Chloride	0.90%	10 mL	5
Suxamethonium	100 mg	2 mL	5
Tramadol Hydrochloride	100 mg	2 mL	2
Vecuronium	4 mg		5
Verapamil	5 mg	2 mL	5
Water for Injections		10 mL	5

YOU MAY WANT TO TAKE ADDITIONAL ITEMS TO THE EMERGENCY SITE DEPENDING ON THE SITUATION AND THE AVAILABILITY OF EQUIPMENT; FOR EXAMPLE:

- Portable cardiac monitor/defibrillator
- M.A.S.T. suit
- Additional splints
- Additional IV giving sets
- Additional Gelofusine® (as much as you can carry)
- Glucose lollies
- Blankets
- Vacuum mattress



Royal Flying Doctor Service - RFDS Western Operations

Call the RFDS Operation's Centre on 1800 625 800 for emergency medical advice or air evacuation. You will be transferred to the nearest RFDS Medical Officer for advice and to arrange transport. It is preferable that direct contact is made with the RFDS Medical Officer so that full appreciation of clinical situations is possible.

BE AWARE

HASTY EVACUATIONS ARE NOT ALWAYS ESSENTIAL.

TIME SPENT IN CAREFUL PREPARATION AND STABILISING THE PATIENT BEFORE EVACUATION CAN ENSURE SAFE TRANSPORT.

TRANSPORTING PATIENTS

PLANNING

Consider:

- Suitability of patient for transport to airport
- Equipment: Is monitoring equipment available to safely transfer patient to airport (ie. cardiac monitoring)?
- Supplies: oxygen/IV fluids/dressings/medications
- Escort requirements:
(ie. RN, Medical Officer, voluntary ambulance officers). RFDS staff will advise on collection of critically ill patients and neonates
- Arrange collection and transport of RFDS staff to nursing post or hospital (where necessary)
Discuss with RFDS Medical Officer who will advise
- Notify ambulance crew of pending patient transfer
- Relatives: notified / accompanying patient (may not always be room on aircraft)
- Limit patient/relative luggage (minimal space in aircraft)

PREPARATION OF PATIENT

- Adequate oxygenation
- IV access, insert three-way tap or small extension to facilitate change over to RFDS equipment
- Adequate hydration, fluid replacement
- Splinting: RFDS and St John Ambulance do not use air splints. (Hare traction, stiff-neck collars, vacuum mattress, scoop stretcher, back slabs, wooden or cardboard splints preferred)
- Indwelling catheter (IDC) or empty bladder pre-flight
- Adequate analgesia
- Sedation for mental health patients and other patient groups as required
- Anti-emetic
- Nasogastric tube (NGT) for all abdominal injuries/bowel-related conditions (seek RFDS advice)
- Chest drain and Heimlich valve for pneumothorax (discuss with RFDS)
- Fasting (if appropriate)
- Remove valuables (give to relatives for safekeeping) and documentation
- Continue to monitor and record vital signs

COMMUNICATION	DOCUMENTATION	
<ul style="list-style-type: none"> ➤ Advise RFDS Medical Officer of any changes in patient condition ➤ Notify RFDS Operations Centre of any local delays in preparation ➤ Confirm receiving hospital's acceptance of patient ➤ Arrange for ambulance to transport patient to airstrip ➤ DO NOT transfer patient to airstrip until RFDS Operations Centre has notified a firm Expected Time of Arrival (ETA) 	<ul style="list-style-type: none"> ➤ RFDS Flight Registration Form ➤ Completion of this form is mandatory for all RFDS transfers. (see sample 224) ➤ Transfer envelope (next page) ➤ A transfer envelope is supplied by RFDS to assist in collating documentation. It has a useful checklist printed on it (see example on the next page) ➤ Referral letter ➤ Nursing Transfer Form (DoH Form) 	<ul style="list-style-type: none"> ➤ Associated charts/forms where appropriate: <ul style="list-style-type: none"> • neurological observation chart • fluid balance chart • mental health forms • partogram • nursing notes / observation charts • ECG ➤ X-rays, specimens, laboratory results

AIRSTRIP REQUIREMENTS

- Suitability for landing (consider recent local weather conditions)
- RFDS need to be advised if there has been any deterioration in airstrip. Checked or inspected pre-RFDS arrival by community member responsible for the airstrip.
- Night lighting, if required, is arranged with the community member responsible for the airstrip
- If local airstrip is unserviceable, consult with RFDS Operations Centre to determine the most suitable alternative



ROYAL FLYING DOCTOR SERVICE OF AUSTRALIA

Western Operations ACN 067 077 696

TRANSFER ENVELOPE / PRE FLIGHT CHECK LIST

Patient's Name: _____

From: _____ To: _____

NB: The completion of the below is optional and is included as an aid for the preparation of a patient transfer.

ALL PATIENTS	SPECIFIC PATIENTS
<ul style="list-style-type: none"><input type="checkbox"/> Notification:<ul style="list-style-type: none"><input type="checkbox"/> Receiving hospital<input type="checkbox"/> RFDS<input type="checkbox"/> Next of kin notified?<input type="checkbox"/> Documentation: <i>* please place all in this envelope</i><ul style="list-style-type: none"><input type="checkbox"/> Referring doctor's letter<input type="checkbox"/> RFDS flight registration form<input type="checkbox"/> Nursing transfer form<input type="checkbox"/> Copies of ECGs, pathology reports, etc.<input type="checkbox"/> X-rays, Pathology Specimens to accompany patient?<input type="checkbox"/> Drugs: anti-emetic, analgesic, sedation preflight?<input type="checkbox"/> IV access? (needle-free injection port preferred)<input type="checkbox"/> Bladder: toilet prior to departure or IDC (?hourly drainage bag)<input type="checkbox"/> Valuables: secured and documented?	<ul style="list-style-type: none"><input type="checkbox"/> Ventilated patients:<ul style="list-style-type: none"><input type="checkbox"/> ETT secured, eyes taped, NGT, IDC in situ<input type="checkbox"/> Mental Health Patients:<ul style="list-style-type: none"><input type="checkbox"/> Secure IV access, pre-flight sedation,<input type="checkbox"/> Forms 1 and 3 (or referral and transport order)<input type="checkbox"/> Chest Trauma: Intercostal catheter taped and secured (Heimlich valve for pneumothorax)<input type="checkbox"/> Spinal patients:<ul style="list-style-type: none"><input type="checkbox"/> Hard Cx collar, head immobilisation, scoop stretcher or vacuum mattress<input type="checkbox"/> Eye injuries: anti-emetic pre flight, eye shielded.<input type="checkbox"/> Fractures: adequate immobilisation, splinting and analgesia. <p><i>Do you require more RFDS flight registration forms?</i> <i>Do you require more of these transfer envelopes?</i></p>
<p>Checked by: _____</p> <p>RFDS CONTACT NUMBERS: 1800 625 800 or 08 9414 1200</p>	

FLIGHT REGISTRATION FORM

Sample FLIGHT REGISTRATION form required by RFDS

BASIC DETAILS:	Today's date:	Time:	Date required:
PATIENT NAME:		AGE:	
ADDRESS:		DOB:	SEX: M/F
NEXT OF KIN:		NOTIFIED: YES / NO	
PATIENT LOCATION:		REFERRING DOCTOR:	TEL:
PATIENT LOCATION:		RECEIVING DOCTOR:	TEL:
DIAGNOSIS:			
CLINICAL DETAILS:	Stretcher <input type="checkbox"/>	Sitter <input type="checkbox"/>	Cot <input type="checkbox"/>
	Mother nursing <input type="checkbox"/>	Thermcot <input type="checkbox"/>	Neonate <input type="checkbox"/>
BRIEF HISTORY			FORMS 1 and 3 <input type="checkbox"/>
BP: / P:	ECG RHYTHM	R:	T:
AIRWAY: ADEQUATE / POOR / VENTILATION REQUIRED			
O2:	SaO2:		
CONSCIOUS STATE:	GCS: EYS	+MOTOR	+VERBAL =
PUPILS:	LINES:	PERIPHERAL	CVC
ARTERIAL:			
IV FLUID TYPE:	RATE:	ADDITIVES:	
FASTING: YES <input type="checkbox"/> NO <input type="checkbox"/>	SINCE:	ORAL FLUIDS: YES <input type="checkbox"/> NO <input type="checkbox"/>	IDC: YES <input type="checkbox"/> NO <input type="checkbox"/>
NGT: YES <input type="checkbox"/> NO <input type="checkbox"/>	WOUND DRAIN: YES <input type="checkbox"/> NO <input type="checkbox"/>	CONTINENT: YES <input type="checkbox"/> NO <input type="checkbox"/>	LAST VOIDED:
URINALYSIS:	ANAESTHETIC CONSENT: YES <input type="checkbox"/> NO <input type="checkbox"/>		
ALLERGIES:	CURRENT MEDICATIONS:	SIGNATURE:	
GRAVIDA:	PARA:	EDD:	LABOUR EST:
CONTRACTIONS:	FREQ:	STRENGTH:	DURATION:
VE & TIME:	BY:	CERVIX	
MEMBRANES:	PV LOSS	FHR:	
OTHER COMPLICATIONS			

FLIGHT REGISTRATION

ROYAL FLYING DOCTOR SERVICE
OF AUSTRALIA
RFDS Western Operations
ACN 067 077 696

White: Receiving hospital copy. Blue: RFDS copy. Pink: Ambulance copy. Yellow: Originating hospital copy. Flight Reg. Form (15/1/2004)

Section Five:

Medications

Drug Profiles for Remote Nursing Emergency Guidelines

July 2005

Note that the information contained in these profiles is only a summary and is correct at the time of publication. For further details it is recommended that reference is made to the current product information and the Australian Medicines Handbook (AMH).

ANALGESIA REGIMEN

IN ADULTS	IN CHILDREN
<ul style="list-style-type: none"> • Give IV bolus if possible: Increments of Morphine 2.5mg (or Pethidine 25mg) until comfortable or to a maximum of Morphine 10mg or Pethidine 100mg • Contact a doctor if more is needed • If no IV access, give IM: <ul style="list-style-type: none"> – Morphine 0.1mg/kg or 276 – Pethidine 1mg/kg 286 	<ul style="list-style-type: none"> • Give IV bolus if possible: <ul style="list-style-type: none"> – Morphine can be given up to 0.1mg/kg (total dose) 276 – Pethidine up to 1mg/kg (total dose) 286 • Can give ¼ the total dose at a time by IV bolus For example 20 kg child: <ul style="list-style-type: none"> – 20 x 0.1mg Morphine = 2mg of Morphine – as the total dose – Therefore, can give 0.5mg Morphine as an increment and repeat up to a total of 2mg • If no IV access give IM <ul style="list-style-type: none"> – Morphine 0.1mg/kg – Pethidine 1mg/kg

ANTIEMETIC

An appropriate antiemetic can be given to adults, such as:

- Metoclopramide (Maxolon®) 10mg **270**
- Prochlorperazine (Stemetil®) 12.5mg **288**
- Either IV or IM

NO ANTIEMETIC SHOULD BE GIVEN TO CHILDREN WITHOUT DISCUSSION WITH A DOCTOR

Children are at greater risk of dystonic reactions.

ACTIVATED CHARCOAL (CARBOSORB® & CARBOSORB S®)

PRESENTATION

Carbosorb®: Aqueous suspension containing activated charcoal 50 g in purified water 300 mL (PVC bag with oro-nasogastric tube connection)

Carbosorb S®: Aqueous suspension containing activated charcoal 50 g in Sorbitol 70% in purified water 300 mL

PHARMACOLOGY

Binds to drugs and poisons, thereby reducing absorption either by binding the substance before absorption in the GIT or by interrupting enterohepatic recirculation.

PRIMARY INDICATIONS

Treatment of poisoning and drug overdose by oral ingestion

CONTRAINDICATIONS

- Poisoning with strong acids and alkalis
- Poisons for which the products' absorptive capacity is too low (ferrous sulfate and other iron salts, cyanides, tolbutamide and other sulfonylureas, malathion and dicophane)
- Any patient with a compromised or potentially compromised airway

PRECAUTIONS

- Should not be administered concomitantly with systemically active emetics such as ipecacuanha
- If an antidote to the specific poison ingested is available, this should be the first choice of treatment; activated charcoal should not be used in conjunction with these antidotes as it may inactivate them

ROUTE OF ADMINISTRATION

Orogastric tube with a minimum gauge of FG16 is the recommended mode of administration; a nasogastric tube may be used, but it may then be necessary to squeeze the bag gently to help the suspension flow.

SIDE EFFECTS

- Vomiting
- Faecal discoloration
- If the suspension contains Sorbitol (Carbosorb S®), diarrhoea may occur
- Minerals, vitamins, enzymes and amino acids may be absorbed from the gastro-intestinal tract causing fluid and electrolyte imbalance, especially with multiple dose regimens, particularly in children
- Monitoring of fluid and electrolyte changes recommended

SPECIAL NOTES

- To be fully effective, should be administered as soon as possible after oral ingestion of the poison, as charcoal can absorb only that portion of the drug not already absorbed from the gastrointestinal tract
- Since charcoal will also absorb any other oral drugs, any concurrent medication should be given parenterally
- Multiple doses may be required for sustained or slow release preparations

DOSE

Adult:

1g/kg bodyweight (to a maximum dose of 50g) as initial dose.
Subsequent doses may be administered every 2 to 6 hours until the first black stool appears

Children:

1g/kg bodyweight (to a maximum of 50g).

ADRENALINE TARTRATE

PRESENTATION

1 mL ampoule	1:1000 (1 mg/ mL)
10 mL ampoule	1:10,000 (pre-diluted) (0.1 mg/ mL)
1 mL syringe	1:1000
10 mL syringe	1:10,000

PHARMACOLOGY

Direct acting sympathomimetic agent exerting its effect on alpha and beta adrenoceptors

MAJOR EFFECTS

- Increased systolic blood pressure
- Reduced diastolic blood pressure
- Tachycardia
- Hyperglycaemia **83**
- Hypokalaemia
- Bronchodilation
- Increased pulse rate
- Peripheral vasoconstriction

PRIMARY INDICATIONS

- Acute allergic reactions (eg. insect stings)
- Asystole
- Anaphylactic reactions
- Severe asthma **142**
- Respiratory distress due to bronchospasm **159**

CONTRAINDICATIONS

- Hypovolaemic Shock **170**
- Arrhythmias (except Asystole)
- Patients on monoamine oxidase inhibitors

PRECAUTIONS

Coronary insufficiency and cardiac dilatation, hypertension, diabetes, elderly patients, hyperthyroidism, non-selective beta-blockers (may result in severe hypotension)

ROUTE OF ADMINISTRATION

Intravenous, intramuscular, endotracheal, intraosseous

SIDE EFFECTS

- Sinus tachycardia
- Supraventricular arrhythmias
- Ventricular arrhythmias
- Hypertension
- Pupillary dilatation
- Anxiety, tremor, restlessness, dizziness
- Dry mouth, cold extremities
- Palpitations

SPECIAL NOTES

- **Intravenous:** Initial effect in 30 seconds; maximal effect 3 to 5 minutes
- Do NOT use if solution is coloured
- **Intramuscular:** Initial effect 30 to 90 seconds; maximal effect 4 to 10 minutes (usually given in thigh NOT buttocks)
- **Nebulised:** 1 mL of the 1 in 1000 (0.1%) solution diluted with 3 mL of normal saline for nebulising. Must be given using oxygen at 6 litres per minute

DOSE

ADRENALINE 1:1,000	ADRENALINE 1:10,000
<ul style="list-style-type: none">• For anaphylactic shock (IM route)• For acute allergic reaction (IM or S/C route)	<ul style="list-style-type: none">• For Cardiopulmonary resuscitation
Adult: 0.3 to 0.5 mL (0.3 to 0.5 mg) administered slowly. Repeated every 5 to 15 minutes if necessary. In severe reactions dose can be increased to 1 mL	Adult: Initial dose 1 mg (10 mL) IV repeated every 3 to 5 minutes if necessary
Children (under 12 years): 0.01 mL/kg (10microgram/kg) of body weight up to a maximum of 0.5 mg per dose. Repeated after 15 minutes if necessary	Children (under 12 years): 0.1 mL/kg (10microgram/kg) of body weight IV repeated every 5 minutes if necessary

AMETHOCAINE HYDROCHLORIDE

PRESENTATION

0.5% Minims 0.5 mL

1% Minims 0.5 mL

Note: A minim is a sterile eye drop in a single use unit

PHARMACOLOGY

Local anaesthetic which, when used in the eye, does not dilate the pupil. Duration of anaesthesia approximately 30 minutes.

PRIMARY INDICATIONS

- Used for minor conjunctival and corneal surgery and for the removal of foreign bodies
- Tonometry (valuable in cases of suspected glaucoma where dilation of the pupil could precipitate an attack)

CONTRAINDICATIONS

Known hypersensitivity to Amethocaine

PRECAUTIONS

- May give rise to dermatitis in hypersensitive patient
- Protect anaesthetised eye from dust and bacterial contamination
- Patients should be warned not to rub or touch the eye while anaesthesia persists

ROUTE OF ADMINISTRATION

Eye drop

SIDE EFFECTS

An initial burning sensation may be complained of, but this passes in less than 30 seconds

SPECIAL NOTE

- Discard Minim after use
- Store under refrigeration

AMIODARONE (EG. CORDARONE X®)

PRESENTATION

Ampoules	150 mg/3 mL
Tablets	100 mg, 200 mg

PHARMACOLOGY

Antiarrhythmic, which decreases sinus node and junctional automaticity, slows AV and bypasses tract conduction and prolongs refractory period of myocardial tissue. Also has weak beta-blocker activity.

PRIMARY INDICATIONS

Treatment and prophylaxis of serious arrhythmias resistant to other treatment.

CONTRAINDICATIONS

- Heart block, symptomatic bradycardia, sick sinus syndrome
- Severe respiratory failure
- Allergy to Amiodarone or iodine
- Pregnancy and lactation

PRECAUTIONS

- During IV administration, blood pressure should be monitored as severe hypotension and circulatory collapse can occur with rapid infusion

ROUTE OF ADMINISTRATION

- Intravenous injection - generally not advised because of haemodynamic risks

- Intravenous infusion - preferred where possible
- Oral

SIDE EFFECTS

- Proarrhythmic effect - may worsen arrhythmias
- Nausea and vomiting
- Sweating
- Headache, dizziness
- Constipation
- Anorexia and taste disturbance
- Long-term - grey/purple skin pigmentation, corneal deposits, photosensitivity, pulmonary toxicity

SPECIAL NOTES

- IV- monitor clinical signs and ECG very closely
- Use non PVC giving sets
- Infuse normally with glucose 5%
- Infuse via large or central vein
- Incompatible with sodium chloride 0.9%, Aminophylline, heparin sodium, sodium bicarbonate

DOSE

Emergency IV 150 to 300mg over 1 to 2 minutes

Loading: IV infusion 5mg/kg over 20 minutes to 2 hours

Maintenance: IV infusion 15 to 20mg/kg over 24 hours

Oral (Loading) 200 to 400mg 3 times daily for one week, followed by 200 to 400mg twice weekly for one week.

Maintenance: 100 to 400mg once daily.

AMOXYCILLIN SODIUM (AMOXYL[®], MOXACIN[®])

PRESENTATION

Vials 500 mg and 1 g

PHARMACOLOGY

Amoxycillin is a semisynthetic antibiotic derived from the penicillin nucleus. It is bactericidal against sensitive organisms during the stage of active multiplication.

PRIMARY INDICATIONS

- Septicaemia (bacterial)
- Skin and soft tissue infections
- Respiratory infection (acute and chronic)
- Genitourinary tract infections (complicated and uncomplicated), acute and chronic
- Gonorrhoea

CONTRAINDICATIONS

- History of hypersensitivity to beta-lactam antibiotics (eg. penicillins, cephalosporins)

PRECAUTIONS

- Not the treatment of choice in patients presenting with sore throat or pharyngitis (underlying cause may be infectious mononucleosis)
- During treatment with high doses of Amoxycillin, particularly by bolus injection, an adequate urinary output must be maintained

ROUTE OF ADMINISTRATION

- Intramuscular injection (may be reconstituted with 0.5% solution of Procaine hydrochloride or a 1% solution of Lignocaine hydrochloride to reduce pain)
- Intravenous injection given slowly (over 10 to 15 minutes)

SIDE EFFECTS

- Hypersensitivity reactions
- Pain may be experienced at the site of intramuscular injection and phlebitis at the site of intravenous injection
- Gastrointestinal effects (nausea, vomiting, diarrhoea)

SPECIAL NOTES

- For IV reconstitute with water for injection, 10 mL. Give over 3 to 5 minutes
- For IM or IV injection, administer immediately after reconstitution as concentrated solution is not stable
- Dose should be reduced in renal failure

DOSE

Adult:

250 mg every 6 to 8 hours

Severe infection – 500 mg every 6 to 8 hours

Bacterial septicaemia- 1 g every 6 hours

Children: (under 20 kg)

20 mg/kg/day every 6 to 8 hours

Severe infection – 40 mg/kg/day every 6 to 8 hours

Bacterial septicaemia- 20 to 40 mg/kg every 6 hours

ASPIRIN (EG. DISPRIN[®], SOLPRIN[®], CARDIPRIN[®])

PRESENTATION

Tablet 100 mg, 300 mg (soluble)

PHARMACOLOGY

Antipyretic, antiplatelet, non-steroidal anti-inflammatory, analgesic

PRIMARY INDICATIONS

- Relief from pain, headaches and migraine headaches, rheumatic pain, colds and flu, period pain, nerve and muscular pain
- Fever
- Platelet aggregation inhibitor

CONTRAINDICATIONS

- Severe hepatic disease or renal damage
- Haemophilia, other bleeding disorders
- Uraemia
- Erosive gastritis or peptic ulcer
- Known hypersensitivity to aspirin

PRECAUTIONS

- Take after food to minimise gastric irritation
- Concomitant therapy with other gastric irritants (eg. non-steroidal anti-inflammatory drugs NSAIDs) may increase risk of gastric irritation

- Concomitant therapy with heparin, warfarin, other antiplatelet or anticoagulant as may increase risk of bleeding
- May precipitate bronchospasm and induce asthma in susceptible individuals
- Avoid use in children \leq 18 years

ROUTE OF ADMINISTRATION

Oral

SIDE EFFECTS

- Minor gastrointestinal bleeding and increased bleeding times
- Nausea, vomiting, activation of peptic ulcers, gastritis
- Tinnitus, vertigo
- Hypersensitivity

DOSE

Adult:

300 to 900 mg every 4 to 6 hours as required (DO NOT exceed 4 doses in 24 hours). Can be dissolved in water.

Platelet aggregation inhibition:

100 to 150 mg daily

ATROPINE

PRESENTATION

Ampoules 0.4 mg/mL, 0.5 mg/mL, 0.6 mg/mL, 1.2 mg/mL
Syringe 0.5 mg/5 mL, 1.0 mg/10 mL (Min-I-Jet)

PHARMACOLOGY

Anticholinergic agent, reduces secretions (saliva, bronchial). Increases heart rate and causes enlarged pupils. It reduces gastric and intestinal motility.

PRIMARY INDICATIONS

- Bradycardia with haemodynamic compromise
- Asystole
- Organophosphate poisoning

CONTRAINDICATIONS

- Known hypersensitivity to atropine or other anticholinergics
- Severe ulcerative colitis
- Gastrointestinal obstruction
- Urinary obstruction and prostatism
- Glaucoma
- Tachycardia
- Pre-eclampsia

PRECAUTIONS

- Doses lower than 0.3 mg Atropine (in adults) may cause paradoxical slowing of heart rate
- Use with caution in hyperthyroidism, hepatic/renal disease, severe heart disease

ROUTE OF ADMINISTRATION

Intravenous
Intratracheal
Intramuscular

SIDE EFFECTS

- Palpitations
- Tachycardia
- Dry mouth
- Blurred vision
- Photophobia
- Constipation
- Urinary retention
- Flushing
- Delirium

SPECIAL NOTES

Intratracheal doses to be diluted with 10 mL water or sodium chloride 0.9%

DOSE

Bradycardia:

Adult IV 0.3 to 1.0 mg, repeat every 3 to 5 minutes until desired rate is achieved (maximum of 0.04 mg/kg).
Should not exceed 2 mg

Intratracheal:

1 to 3 mg, repeat every 3 to 5 minutes until desired rate achieved

Child:

IV/intratracheal 0.02 mg/kg/dose (maximum dose 0.5 mg),
repeat every 5 minutes until desired rate is achieved to a total MAXIMUM of 1 mg

Asystole:

Adult IV 3 mg once only: intratracheal 6 mg once only

CEFTRIAZONE SODIUM (EG. ROCEPHIN®)

PRESENTATION

Vials (powder for reconstitution) 0.25g, 0.5g, 1g, 2g

PHARMACOLOGY

Broad spectrum cephalosporin antibiotic

PRIMARY INDICATIONS

Treatment of following infections when caused by susceptible aerobic organisms

- Lower respiratory tract
- Skin
- Urinary tract
- Uncomplicated gonorrhoea
- Bacterial septicaemia
- Bone and joint infections
- Meningitis
- Surgical prophylaxis

CONTRAINDICATIONS

Known allergy to the cephalosporin class of antibiotics, or major allergy to penicillin

PRECAUTIONS

- Use with care in persons with renal or hepatic disease
- Use in pregnancy only if clearly needed
- Should not be given to sick neonates at risk of developing bilirubin encephalopathy (especially premature infants)

ROUTE OF ADMINISTRATION

- Intravenous (reconstitute in 5 to 10 mL water for injection and give over 3 to 5 minutes)
- Intramuscular (may be dissolved in 1% Lignocaine solution and administered by deep intragluteal injection)

SIDE EFFECTS

- Local pain, induration, tenderness at site of injection; phlebitis after IV administration
- Allergic reaction (usually rash), more severe reactions less frequently
- Haematological changes
- Gastrointestinal symptoms, especially diarrhoea
- Hepatic and renal related biochemical disturbances
- Headache, dizziness
- Nausea, rash
- Diaphoresis, flushing

DOSE

Adult:

1 to 2g given once daily or in equally divided doses twice a day (depending on type and severity of the infection)
No more than 1g in each injection site

Children:

50 to 75 mg/kg (NOT to exceed 2 g) given once daily or in divided doses twice a day. In meningitis, dose should be given every 12 hours.

CHLORAMPHENICOL (CHLOROMYCETIN®)

PRESENTATION

Vials 1g

PHARMACOLOGY

Antibiotic effective in a wide variety of bacterial and rickettsial infections. It possesses high antimicrobial activity, crosses tissue barriers readily, and diffuses widely and rapidly through nearly all body tissues and fluids.

PRIMARY INDICATIONS

- Bacterial meningitis
- Typhoid fever
- Rickettsial infections
- Intraocular infections

CONTRAINDICATIONS

History of previous hypersensitivity and/or toxic reaction to Chloramphenicol

PRECAUTIONS

- Should not be used for the treatment of trivial infections
- May cause blood dyscrasias, including aplastic anaemia
- Overgrowth of nonsusceptible organisms
- Excessive blood levels may result from administration of the recommended dose to patients with impaired liver or kidney function, including those due to immature metabolic processes in the premature and full-term infant
- Drug interactions between Chloramphenicol and certain

drugs metabolised hepatically may occur (eg. anticoagulants, anticonvulsants)

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Intravenous injection

SIDE EFFECTS

- Gastrointestinal symptoms
- Headache

SPECIAL NOTES

Toxic reactions due to inadequate development of hepatic and renal function, have been reported in premature and newborn infants (Grey Syndrome)

DOSE

Adult:

50 mg/kg/day in divided doses at 6-hourly intervals (up to 100 mg/kg/day in severe situations)

Premature, newborn and children with immature metabolic processes (see special notes):

25 mg/kg/day in divided doses at 6-hourly intervals
After the first 2 weeks of life, full-term infants may receive up to a total of 50 mg/kg/day in divided doses at 6-hourly intervals.

COMPOUND SODIUM LACTATE (HARTMANN'S SOLUTION®)

PRESENTATION

500 mL/1000 mL infusion pack

PHARMACOLOGY

Isotonic crystalloid solution

Composition:

Electrolyte: sodium, potassium, calcium, chloride and lactate in a similar concentration to those in extracellular fluid.

PRIMARY INDICATIONS

- As a replacement fluid in volume-depleted patients
- Unresponsive non-hypovolaemic hypotension other than of cardiac origin

CONTRAINDICATIONS

- Cardiac heart failure
- Severe renal dysfunction

ROUTE OF ADMINISTRATION

Intravenous infusion

SPECIAL NOTES

- In volume-depleted patients, Compound Sodium Lactate should be alternated with a colloid, eg. Haemaccel®
- If no other fluid is available, Compound Sodium Lactate should be initially used to keep a vein open for the

intravenous administration of emergency drugs but should be replaced with 5% Dextrose as soon as possible

- Intravascular half-life is approximately 30 to 60 minutes
- Excessive administration will provoke fluid overload and may cause pulmonary oedema

DOSE

The dose of Hartmann's required will depend on the clinical status of the patient (eg. degree of hypovolaemia). Discuss with Doctor if greater than 300 mL per hour required.

Adult:

Resuscitation – 20 mL/kg rapidly infused (eg: 20 to 30 minutes) intravenously. The infusion should be slowed when circulation is improved and the patient reassessed

Child:

Hypovolaemia – 20 mL/kg then reassess status
– 10 mL/kg neonates less than 4 weeks then reassess status

DEXAMETHASONE

PRESENTATION

Ampoules	4 mg/ mL, 1 mL
Vials	4 mg/ mL, 2 mL

PHARMACOLOGY

Dexamethasone is a synthetic adrenocortical steroid possessing basic glucocorticoid actions and effects. It has pronounced anti-inflammatory activity at the tissue level.

PRIMARY INDICATIONS

- Adrenocortical insufficiency
- Shock
- Rheumatic disorders
- Collagen diseases
- Allergic states
- Cerebral oedema
- Antenatal prophylaxis for neonatal respiratory distress syndrome
- A wide range of other conditions characterised by inflammation

CONTRAINDICATIONS

- Systemic fungal infections
- Hypersensitivity to sulfites or any other component of the medication

PRECAUTIONS

- Recent myocardial infarction
- Administration of live virus vaccines
- Active tuberculosis
- Active latent amoebiasis and strongyloidiasis
- Pregnancy

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Intravenous injection
- Intravenous infusion

SIDE EFFECTS

- May mask some signs of infections
- Fluid and electrolyte imbalance, elevation of blood pressure
- Gastrointestinal (including peptic ulceration)

SPECIAL NOTES

May be given directly from the vial without mixing or dilution, or can be added to Sodium Chloride injection, Glucose injection or compatible blood for infusion.

DOSE

(IV and IM)

Adult:

(The initial dose 0.5 to 20 mg/day depending on specific indication)

In emergencies (excluding shock) the usual dose is 4 to 20 mg IV or IM. This dose may be repeated until adequate response is noted (usually maximum of 80 mg/day)

Shock: 2 to 6 mg/kg bodyweight as single dose IV.

Can be repeated after 2 to 6 hours

Cerebral Oedema: initially 20 mg IV followed by 4 mg IM every 6 hours until symptoms subside.

Children:

(Croup and Epiglottitis)

0.6 mg/kg IV or IM as a single dose then continue with oral doses for 2 to 3 days as required.

DIAZEPAM (EG. VALIUM®)

PRESENTATION

Ampoule 10 mg/2 mL
(Tablet and liquid formulations available)

PHARMACOLOGY

- Benzodiazepine
- Central nervous system depressant which has sedative, anxiolytic, muscle-relaxing and anti-convulsive effects

PRIMARY INDICATIONS

- Status epilepticus and other acute seizures
- Convulsions due to poisoning
- Adjunct to alcohol withdrawal
- Muscle spasm
- Short-term use in anxiety or insomnia

CONTRAINDICATIONS

- Primary treatment of psychosis and depression
- Respiratory depression
- Acute pulmonary insufficiency
- Phobic or obsessional states
- Head injury
- Myasthenia gravis

PRECAUTIONS

- Respiratory disease
- Muscle weakness
- Pregnancy, breastfeeding
- Reduce dose in elderly and debilitated patients and in hepatic and renal impairment

ROUTE OF ADMINISTRATION

- Intravenous
- Intramuscular
- Rectally – useful in children

SIDE EFFECTS

- Sedation
- Hypotension
- Respiratory depression – Apnoea
- Dizziness and confusion
- Muscle weakness and ataxia

SPECIAL NOTES

Intravenous:

Initial effect in 1 to 5 minutes, duration of effect 2 to 3 hours
IV injection should be given into a large lumen vessel (eg. antecubital vein) and should be administered slowly (5 mg/minute)

DO NOT give by infusion as Diazepam binds to PVC plastic

Intramuscular:

Initial effect in 15 to 30 minutes, duration of effect 3 hours
IM generally not used because of slow and erratic absorption.

DOSE

Seizures:

Adult

5 to 20 mg (0.15 to 0.3 mg/kg) slow IV (2 to 5 mg/min).
Repeat if needed to a max of 50 mg over 60 mins.

Child

0.2 to 0.3 mg/kg slow IV (2 to 5 mg/min)
to a max of 5 mg/day in child < 3 years
and 10 mg/day in child > 3 years
Rectal 0.3 to 0.5 mg/kg up to 10 mg/day

Muscle spasm:

Adult

10 mg slow IV (2 to 5 mg/min), repeat if needed after 4 hours

Child

0.1 to 0.3 mg/kg slow IV (2 to 5 mg/min) every 1 to 4 hours up
to a maximum of 0.6 mg/kg in 8 hours

Acute alcohol withdrawal:

10 mg IV then 5 to 10 mg in 3 to 4 hours if necessary

ERGOMETRINE MALEATE

PRESENTATION

500 microgram/1 mL ampoule

PHARMACOLOGY

Stimulates the smooth muscle of the uterus producing rhythmic contractions

PRIMARY INDICATIONS

Administered after delivery of the placenta for the purpose of contracting the uterus in order to prevent or treat postpartum haemorrhage and post-abortion haemorrhage

CONTRAINDICATIONS

- During the first and second stage of labour (ie. before the baby has been born)
- Severe or persistent sepsis
- Patients with vascular disease
- Patients with threatened spontaneous abortion
- Known hypersensitivity to Ergometrine
- Suspicion of retained placenta
- Eclampsia or pre-eclampsia
- Peripheral vascular disease or heart disease and in patients with hypertension
- Hypertension

PRECAUTIONS

Ergometrine should be used cautiously in patients with:

- Calcium deficiency
- Heart disease
- Children
- Veno-atrial shunts
- Mitral valve stenosis
- Impaired renal/hepatic function

ROUTE OF ADMINISTRATION

- Intravenous: give slowly (over at least 1 minute, preferably diluted with sodium chloride 0.9%, 5 mL)
- Intramuscular

SIDE EFFECTS

- Nausea and vomiting
- Vertigo
- Coronary artery or peripheral vasospasm
- Hypertension
- Decreased prolactin
- Ventricular arrhythmias

SPECIAL NOTES

- Uterine contractions are usually initiated almost immediately following IV injection or within 2 to 5 minutes of IM injection

- Uterine contractions persist for 3 hours or longer after administration and for 45 minutes after IV injection.
- Store under refrigeration.

DOSE***Prophylaxis of postpartum or post-abortion haemorrhage:***

200 micrograms IM

Emergency situations:

200 micrograms may be given IV slowly over at least one minute

Treatment of postpartum or post-abortion haemorrhage:

0.25 to 0.5 mg IM or by slow IV

FRUSEMIDE (EG. LASIX[®], UREX[®])

PRESENTATION

Ampoule	20 mg/2 mL
Ampoule	40 mg/4 mL
Ampoule	250 mg/25 mL
Syringe	80 mg/8 mL (Min-I-Jet)

PHARMACOLOGY

Potent loop diuretic (ie. inhibits water, sodium and chloride reabsorption from the ascending loop of Henle in the renal tubule)

PRIMARY INDICATIONS

- Oedema
- Oliguria due to renal failure
- Hypertension

CONTRAINDICATIONS

- Complete renal shutdown
- Known hypersensitivity to Sulfonamides
- Pre-comatose states associated with liver cirrhosis
- Porphyria
- Newborn infants with jaundice or conditions that might induce hyperbilirubinaemia
- Severe sodium and fluid depletion
- Untreated hypokalaemia and hyponatraemia

PRECAUTIONS

- Pregnancy
- May cause hypokalaemia and hyponatraemia
- Aggravates diabetes mellitus and gout
- Liver failure
- Prostatic enlargement
- Rapid IV injection or infusion can cause ototoxicity

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Slow intravenous injection
- Intravenous infusion

SIDE EFFECTS

- Hyponatraemia
- Hypokalaemia
- Alkalosis
- Increased calcium excretion
- Hypotension
- Tinnitus

SPECIAL NOTES

- Following intravenous administration, Frusemide has initial effect within some minutes and peak effect within 30 minutes. Duration of effect is about 2 hours

- 250 mg ampoule for infusion ONLY
- Rate of injection SHOULD NOT exceed 4 mg/minute

DOSE**Adults:**

Oedema: 20 to 40 mg IM or IV as a single dose. Dose may be raised by 20 mg and given not sooner than 2 hours after previous dose until diuretic effect obtained

Children:

1 mg/kg bodyweight IM or IV. Dose may be increased by 1 mg/kg and given not sooner than 2 hours after previous dose. Maximum dose 6 mg/kg

GELOFUSINE® (GELATIN SUCCINYLATED)

PRESENTATION

Infusion pack 500 mL

PHARMACOLOGY

Colloidal plasma volume expander

PRIMARY INDICATIONS

Colloidal plasma volume substitute used in hypovolaemia, haemodilution, extracorporeal circulation

CONTRAINDICATIONS

- Hypervolaemia, hyper-hydration, severe cardiac insufficiency, severe blood clotting disorders
- Hypersensitivity to gelatin

PRECAUTIONS

- Use with care in impaired renal/hepatic function, hypertension, pulmonary oedema, blood coagulation disorders, hypernatraemia and dehydration
- Only mixtures of known compatibility should be prepared
- Do not use unless the solution is clear and free of particles

ROUTE OF ADMINISTRATION

Intravenous infusion

SIDE EFFECTS

Allergic anaphylactoid reactions of varying severity may occur. These reactions may occur as skin reactions or flushing of the face and neck. In rare cases hypotension, shock or cardiac and respiratory arrest may occur.

SPECIAL NOTES

Gelofusine® has been associated with rare but severe reactions similar to anaphylaxis. Patients should be monitored carefully and infusion stopped and treatment initiated immediately if relevant signs and symptoms occur.

DOSE

Total dosage, duration and rate of infusion will depend on the condition.

The first 20 to 30 mL should be infused slowly under careful observation.

As soon as symptoms of circulatory overload manifest (eg. dyspnoea, jugular vein congestion), the infusion should be stopped immediately.

ADULT DOSAGE GUIDELINES

INDICATION	AVERAGE RECOMMENDED DOSAGE
Prevention of hypovolaemia and hypotension. Treatment of mild hypovolaemia (eg. slight blood and plasma losses)	500 to 1000 mL
Treatment of severe hypovolaemia	1000 to 2000 mL
In emergency, life-threatening situations	500 mL as rapid infusion (under pressure), then after improvement of cardiovascular parameters, further infusion of Gelofusine® should be administered in a quantity equivalent to the volume deficit
Haemodilution (isovolaemic)	The volume of Gelofusine® administered should be equivalent to the amount of plasma removed. As a rule, however, this should be no more than 20 mL/kg bodyweight per day
Extracorporeal circulation	This is dependent on the circulation system used but is usually about 500 to 1500 mL

GLUCAGON

PRESENTATION

Vial containing 1 mg (1 IU) of glucagon as a powder for reconstitution. Reconstitute with diluent provided or as instructed by the specific product literature.

PHARMACOLOGY

- Hyperglycaemic agent that mobilises hepatic glycogen which is released into the blood stream as glucose
- Glycagon is an insulin antagonist

PRIMARY INDICATIONS

- For the treatment of severe hypoglycaemia in diabetic patients using insulin or oral hypoglycaemic drugs
- Termination of insulin coma

CONTRAINDICATIONS

- Pheochromocytoma
- Glucagonoma
- Insulinoma
- Known hypersensitivity to glucagon

PRECAUTIONS

- The presence of solid particles in the reconstituted solution is a contraindication to its use at any time
- Ineffective in chronic hypoglycaemia, starvation and adrenal insufficiency

ROUTE OF ADMINISTRATION

- Subcutaneous injection
- Intramuscular injection
- Intravenous injection

SIDE EFFECTS

- Transient nausea and vomiting
- Rarely, hypersensitivity reaction

SPECIAL NOTES

After SC, IM or IV administration a response will normally be seen in 10 minutes. If not, the injection may be repeated, but intravenous glucose is preferred.

Note: 1 unit of glucagon = 1 mg glucagon

DOSE

Hypoglycaemia: (SC, IM or IV)

Adults and children > 25 kg: 1 mg

Children < 25 kg: 0.5 mg

If patient does not respond within 10 minutes, IV glucose should be given.

GLUCOSE 5%

PRESENTATION

500 mL infusion soft pack
100 mL infusion soft pack

PHARMACOLOGY

Isotonic crystalloid solution

Composition:

Glucose 5% in water

Actions:

Monosaccharide that provides the principle source of energy for the body. It is also involved in many additional areas of protein and fat metabolism.

PRIMARY INDICATIONS

- Treatment of carbohydrate and fluid depletion
- Vehicle for the mixing and intravenous administration of drugs
- Fluid to keep vein open for the intravenous administration of emergency drugs
- Hypoglycaemia

CONTRAINDICATIONS

Nil of significance in the above indications

PRECAUTIONS

Prolonged IV infusion may cause fluid overload and electrolyte disturbance

ROUTE OF ADMINISTRATION

Intravenous infusion

SIDE EFFECTS

Local reaction (eg. phlebitis) may occur

SPECIAL NOTES

- If no other fluid is available, Glucose 5% could be initially used as a replacement fluid in volume-depleted patients but should be replaced with Compound Sodium Lactate (Hartmann's Solution) as soon as possible
- Intravascular half-life is approximately 20 to 40 minutes
- Should not be infused through the same IV giving set as blood

DOSE

- Dependent on age, weight and fluid, electrolyte, glucose and acid-base balance of the patient
- Rate of infusion SHOULD NOT exceed 10 mL/kg/hour
- May be administered via a peripheral line

GLUCOSE 50%

PRESENTATION

Pre-drawn syringe	25 g/50 mL
Ampoule	5 g/10 mL

PHARMACOLOGY

- Glucose is the principal source of energy for the body
- A 50% solution of Glucose is **STRONGLY HYPERTONIC** and will promote diuresis by increasing the osmotic pressure of the glomerular filtrate

PRIMARY INDICATIONS

- Severe hypoglycaemia resulting from insulin excess
- For reduction of increased cerebro-spinal pressure and/or cerebral oedema due to delirium tremens or acute alcohol intoxication

CONTRAINDICATIONS

- Diabetic coma while blood sugar levels are elevated
- The presence of intracranial or intraspinal haemorrhage
- In delirium tremens, if the patient is already dehydrated
- Anuria
- Patients at risk for ischaemic stroke

PRECAUTIONS

- Inject slowly to avoid increasing the osmotic tension of the blood at the point of injection (ie. 3 mL/minute)
- Observe frequently for signs of dehydration

ROUTE OF ADMINISTRATION

Intravenous

SIDE EFFECTS

- Anaphylactoid effect
- Thrombophlebitis
- Occasionally a generalised flush which subsides within 10 minutes
- Hyperglycemia

SPECIAL NOTES

- The rate of utilisation of glucose varies considerably from patient to patient
- After 25 g of Glucose has been given it is advisable to evaluate the effect
- Review product information for incompatibilities

DOSE

(IV route only)

Hypoglycaemia:

Adults and children

50% solution 20 to 50 mL by slow (3 mL/min) IV injection.
Total dose will vary according to response

Children and neonates

50% solution 1 mL/kg then adjust as required.

GLYCERYL TRINITRATE (KNOWN AS 'GTN') (EG. ANGININE[®], NITROLINGUAL[®], NITROBID[®], MINITRAN[®], NITRADISC[®], TRANSIDERM[®], NITRO[®])

PRESENTATION

Pump spray	400 microgram/spray
Tablets	600 microgram
Ampoules	50 mg/10 mL
* Ointment	2%
* Self-adhesive pads	release rate 5 mg per 24 hours
	release rate 10 mg per 24 hours
	release rate 15 mg per 24 hours
	release rate 25 mg per 24 hours
	release rate 50 mg per 24 hours

(* these topical preparations allow for transdermal absorption of GTN)

PHARMACOLOGY

GTN is a nitrate and is effective in providing rapid symptomatic relief from angina. It is a potent coronary vasodilator although its principal benefit follows from a reduction in venous return, which reduces left ventricular work and decreases myocardial oxygen requirements.

PRIMARY INDICATIONS

- Congestive cardiac failure associated with acute myocardial infarction
- Prophylaxis and treatment of angina
- Left ventricular failure
- Unstable angina

CONTRAINDICATIONS

- Hypotension
- Marked anaemia
- Head trauma
- Constrictive pericarditis and pericardial tamponade
- Cerebral haemorrhage
- Closed-angle glaucoma
- Combined use with Sildenafil, Tadalafil, Vardenafil

PRECAUTIONS

- Hypotensive conditions
- Tolerance (some patients on long-acting transdermal nitrites rapidly develop tolerance)

ROUTE OF ADMINISTRATION

- Sublingual, Buccal
- Transdermal
- Intravenous infusion

SIDE EFFECTS

- Throbbing headache
- Flushing
- Dizziness and syncope
- Orthostatic hypotension
- Tachycardia
- Nausea and vomiting
- Palpitations

SPECIAL NOTES

- GTN is susceptible to heat and moisture. Make sure that tablets are stored in their original light-resistant, tightly sealed bottle. Tablets should be discarded 3 months after opening the bottle
- Buccal administration gives an initial effect between 30 seconds and 2 minutes; maximum effect in 5 to 10 minutes; duration of effect 15 to 30 minutes
- Dilute injection in glass bottle and use non-absorbing tubing for giving set

DOSE

(IV infusion)

Adult:

Starting dose 5 microgram/minute (via non-absorbing tubing) and increase at increments of 5 microgram/minute every 3 to 5 minutes (Usual dose in heart failure is 20 to 80microgram/min)

Oral:

Sublingual tablet

1 tablet (600 microgram) under the tongue at first sign of angina. If 2 to 3 tablets over 15 minutes do not relieve pain, consult doctor.

Sublingual spray

Prime before first use by pressing nozzle 5 times. If not used for 7 days prime with one spray. If not used for >4 months prime several times until an even spray is obtained. If two sprays under the tongue over 15 minutes do not relieve pain consult doctor.

HALOPERIDOL (SERENACE®)

PRESENTATION

Ampoule	5 mg/1 mL
Ampoule	10 mg/1 mL
Tablets	0.5 mg, 1.5 mg, 5 mg,
Liquid	2 mg/mL

PHARMACOLOGY

Butyrophenone antipsychotic. Selective effect on CNS by competitive blockade of D2 receptors resulting in antipsychotic effects.

PRIMARY INDICATIONS

- Treatment of agitation and aggressiveness associated with acute psychosis (eg. mania, hypomania, acute schizophrenia, and toxic confusional states including delirium tremens)
- Treatment of acute and chronic psychosis
- (Intractable nausea and vomiting associated with radiation or malignancy)

CONTRAINDICATIONS

- Comatose states
- In the presence of Central Nervous System depression due to alcohol and other depressant drugs
- Parkinson's disease
- Known hypersensitivity to Haloperidol
- Children under 3 yrs of age
- Basal ganglia lesions

PRECAUTIONS

- Thyrotoxic patients may be more prone to side effects
- Caution in patients where QT interval may be prolonged
- Neuroleptic malignant syndrome (rare)
- Pregnancy and lactation (category C)
- Elderly

ROUTE OF ADMINISTRATION

- Intramuscular
- Oral
- Intravenous
(slow injection or bolus - use only in exceptional cases)

SIDE EFFECTS

- Extrapyrimal reactions such as Parkinson-like symptoms, akathisia or dystonic reactions
- Tachycardia, arrhythmias and postural hypotension
- Sedation
- Visual disturbances
- Orthostatic hypotension

SPECIAL NOTES

- Where rapid control of an acutely disturbed patient is required, or where heavier than usual dosages are envisaged, or when parenteral administration is required, then the patient should be transferred as soon as possible to a situation where resuscitative measures and parenteral

- anti-Parkinson medication are available.
- IV administration should only be used in exceptional circumstances
- Haldol® is a long-acting form of Haloperidol used for maintenance therapy

DOSE

Adult:

Agitation and aggressiveness 2 to 10 mg IM or IV (can be repeated ½ hourly for IV or hourly for IM. Maximum daily dose 100 mg).

Oral 5 to 10 mg every 2 hours as needed

Use lower doses in the elderly

Children:

Severely aggressive or hostile children >3 years,
1 to 3 mg/day orally

HYDRALAZINE (APRESOLINE®)

PRESENTATION

Ampoules (powder for reconstitution) 20 mg

PHARMACOLOGY

Hydralazine exerts its peripheral vasodilating effect through direct relaxation of smooth muscle tissue, predominantly in the arterioles

PRIMARY INDICATIONS

- Hypertensive crisis, especially during late pregnancy (pre-eclampsia and eclampsia)

CONTRAINDICATIONS

- Known hypersensitivity to Hydralazine or Dihydralazine
- Idiopathic Systemic Lupus Erythematosus (SLE) and related diseases
- Severe tachycardia and heart failure with high cardiac output (eg. in thyrotoxicosis)
- Myocardial insufficiency due to mechanical obstruction (eg. mitral or aortic valve stenosis, constricting pericarditis)
- Isolated right ventricular heart failure due to pulmonary hypertension
- Dissecting aortic aneurysm

PRECAUTIONS

- Cardiac dysfunction
- Cerebral vascular disease
- Renal impairment
- Hepatic dysfunction

ROUTE OF ADMINISTRATION

- Slow intravenous injection
- Intravenous infusion

SIDE EFFECTS

- Tachycardia
- Palpitation
- Headache

SPECIAL NOTES

- Once reconstituted, Hydralazine should be used immediately
- Must be given slowly to avoid precipitous decreases in mean arterial pressure with a critical reduction in cerebral or uteroplacental perfusion

DOSE

Adult:

Initial dose 5 to 10 mg by slow IV injection. If necessary, repeat dose at intervals of 20 to 30 minutes. IV infusion - flow rate of 200 to 300 mcg/minute initially and reduced as patient stabilises

HYDROCORTISONE SODIUM SUCCINATE (EG. SOLU-CORTEF®)

PRESENTATION

Vials containing 100 mg of powder for reconstitution
Vials containing 250 mg of powder for reconstitution
Vials containing 500 mg of powder for reconstitution

Reconstitute using the diluent provided or as instructed by the specific product literature.

PHARMACOLOGY

- Hydrocortisone (cortisol) is a corticosteroid formed and secreted by the adrenal cortex
- It is a glucocorticoid corticosteroid with mineralocorticoid properties and as such has numerous and widespread effects including metabolic and anti-inflammatory actions

PRIMARY INDICATIONS

- Asthma
- Acute allergic reactions including anaphylactic reaction
- Severe shock arising from surgical or accidental trauma
- Acute adrenal crisis
- Ulcerative colitis and regional enteritis during critical periods
- Acute adrenal insufficiency

CONTRAINDICATIONS

- Hypersensitivity to Hydrocortisone
- Systemic fungal infections

PRECAUTIONS

- May impair the ability to resist and counteract infection; in addition, clinical signs and symptoms of infection are suppressed
- Long-term administration may result in drug-induced secondary adrenocortical insufficiency
- Active tuberculosis

ROUTE OF ADMINISTRATION

- Intravenous injection
- Intravenous infusion
- Intramuscular injection

SIDE EFFECTS

- Sodium retention
- Fluid retention
- Congestive heart failure in susceptible patients
- Potassium loss
- Hypokalaemic alkalosis
- Hypertension
- Peptic ulcer with possible perforation and haemorrhage

- Convulsions
- Increased intracranial and intraocular pressure

SPECIAL NOTES

After IV administration, the clinical effect is seen in 2 to 4 hours and it persists for up to 8 hours

DOSE (IV or IM)**Adult:**

Initial dose 100 to 500 mg depending on severity of condition (usually 100 mg). May be repeated at intervals of 2, 4, or 6 hours as indicated.

IV - 100 mg over 30 seconds

Child:

IV/IM 2 to 4 mg/kg every 6 hours for 24 hours then reduce

INSULIN, NEUTRAL INJECTION (EG. ACTRAPID®)

PRESENTATION

Vial 100 IU/ mL

PHARMACOLOGY

Principal action is to accelerate the passage of glucose into the cells. Human monocomponent insulin is characterised by being identical to natural human insulin and by monocomponent purity. Actrapid® is short-acting, with onset of effect in 0.5 hours, maximum effect in 2.5 to 5 hours and duration of effect of 8 hours.

PRIMARY INDICATIONS

- Insulin-dependent Diabetes
- Diabetic Ketoacidosis
- Hyperkalaemia

CONTRAINDICATIONS

- Hypoglycaemia
- Hypersensitivity to human insulin

PRECAUTIONS

- Under certain circumstances, eg. insufficient food intake, increased physical activity, etc, the daily insulin dose administered may represent an overdose leading to hypoglycaemia
- During periods of illness insulin requirements may increase

ROUTE OF ADMINISTRATION

- Subcutaneous injection (preferred for self-administration)
- Intramuscular injection
- Intravenous infusion

SIDE EFFECTS

Disturbances of fat metabolism, insulin resistance and hypersensitivity reactions have been associated with insulin therapy, but the incidence and severity of these unwanted effects are minimal with human monocomponent insulin.

SPECIAL NOTES

- Actrapid® should be used only if it is clear and colourless
- Store under refrigeration, DO NOT freeze (discard if frozen). The vial in use may be kept at room temperature (maximum 25°C) for one month
- Injection should be followed by a meal within 30 minutes

DOSE

For Hyperglycaemia:

- 10 to 20 units Actrapid® insulin IV bolus. Followed by insulin infusion at 5 units per hour. Measure blood sugar level hourly and adjust as required
- 5 units of Actrapid® insulin to 50 mL 50% dextrose - run over 30 minutes

IPRATROPIUM (EG. ATROVENT®)

PRESENTATION

Metered Dose Inhaler (MDI) 20, 40 microgram/dose Forte
Nebuliser Solution (NEB) 250, 500 microgram/mL

PHARMACOLOGY

Anticholinergic bronchodilator. Promotes bronchodilatation by inhibiting cholinergic bronchomotor tone.

PRIMARY INDICATIONS

- Severe acute asthma
- Maintenance of COPD and severe asthma

CONTRAINDICATIONS

- Allergy to soya lecithin or related food products such as soya bean and peanuts (MDI only)
- Atropine hypersensitivity

PRECAUTIONS

- May aggravate glaucoma and prostatic hypertrophy
- Direct contact of spray with eye may cause reversible disturbance of accommodation

ROUTE OF ADMINISTRATION

MDI
Nebuliser

SIDE EFFECTS

- Tachycardia and palpitations
- Dry mouth
- Throat irritation
- Constipation, diarrhoea, vomiting, headache
- Urinary retention

SPECIAL NOTES

Dilute multi-dose solution for nebulisation with sodium chloride 0.9% solution.

DOSE

Adult:

COPD and severe asthma

MDI, 40 micrograms, repeat 3 to 4 times daily as necessary; up to 80 micrograms 3 to 4 times daily may be needed
Neb, 250 to 500 micrograms up to 3 to 4 times daily (diluted with 2 to 3 mL of normal saline)

Severe acute asthma

Neb, 500 micrograms every 2 hours with Salbutamol

Child:

Severe acute asthma

MDI, 40 to 80 micrograms every 20 minutes, up to 3 doses in the first hour
Neb, 250 micrograms (diluted with 2 to 3 mLs of normal saline) every 20 minutes, up to 3 doses in the first hour

ISOSORBIDE DINITRATE (EG. ISORDIL®)

PRESENTATION

Tablets 5 mg (sublingual), 10 mg, 20 mg

PHARMACOLOGY

Provides an exogenous source of nitric oxide, which mediates vasodilator effects thus reducing venous return and preload to the heart, reducing myocardial oxygen requirement

PRIMARY INDICATIONS

- Prevention and treatment of angina
- Acute and chronic heart failure

CONTRAINDICATIONS

- Hypotension
- Hypovolaemia
- Hypertrophic obstructive cardiomyopathy
- Cardiac tamponade
- Aortic or mitral stenosis
- Cor pulmonale
- Marked anaemia
- Raised intracranial pressure
- Use of Sildenafil (Viagra)

ROUTE OF ADMINISTRATION

- Oral
- Sublingual

SIDE EFFECTS

- Headache
- Dizziness
- Flushing
- Palpitations
- Orthostatic hypotension
- Bradycardia

SPECIAL NOTES

Sit or lay the patient before use as the drug may cause dizziness

DOSE

Acute angina:

Sublingual tablet 5 to 10 mg

Acute heart failure:

Sublingual tablet 5 to 10 mg every 2 hours or as needed

Chronic heart failure:

Oral tablet 20 to 40 mg 4 times daily

Chronic angina:

Oral tablet 10 to 40 mg up to 3 times daily

KETAMINE (KETALAR®)**PRESENTATION**

Ampoules 200 mg/2 mL

PHARMACOLOGY

Produces dissociative anaesthesia primarily by antagonising NMDA receptors.

Also interacts with opioid receptors in brain and spinal cord.

PRIMARY INDICATIONS

- Induction and maintenance of anaesthesia
- Accepted indication in pain relief usually in conjunction with other analgesics

CONTRAINDICATIONS

Allergy to Ketamine

PRECAUTIONS

- Dilute dose with an equal volume of water for injection, sodium chloride 0.9% or glucose 5% before IV injection
- Give slowly over 60 seconds. More rapid administration may result in respiratory depression and enhanced hypertensive response
- Irrational behaviour and hallucinations may occur

- Premedication with an anticholinergic to reduce secretions is recommended
- Should be used only in presence of intubation equipment and medical personnel that are able to intubate

ROUTE OF ADMINISTRATION

Intramuscular injection

Intravenous injection

Intravenous infusion

SIDE EFFECTS

- Hypertension and increased heart rate
- Increased muscle tone
- Lacrimation
- Hypersalivation
- Raised intracranial and intraocular pressure
- Diplopia
- Nystagmus
- Emergence reactions for up to 24 hours - vivid dreams, restlessness, hallucinations and confusion

SPECIAL NOTES

After a single dose, analgesic effects last about 40 minutes and amnesia lasts 1 to 2 hours

Transient apnoea may occur after IV injection

DOSE***Induction***

IV 1.0 to 4.5 mg/kg; usually 2 mg/kg over 60 seconds provides anaesthesia within 30 seconds lasting for 5 to 10 minutes

IM 6.5 to 13 mg/kg; usually 10 mg/kg provides anaesthesia within 3 to 4 minutes lasting 12 to 25 minutes

IV infusion 0.5 to 2.0 mg/kg initially then 10 to 45 micrograms/kg/minute

Maintenance

IV increments of half to full dose repeated as required

LIGNOCAINE HYDROCHLORIDE FOR CARDIAC ARRHYTHMIAS**PRESENTATION**

- Xylocard® 100 Bolus intravenous solution
100 mg/5 mL (2%) with disposable syringe.
- Xylocard® 500 Infusion solution
100 mg/5 mL (10%)

PHARMACOLOGY

An antiarrhythmic effect is exerted by increasing the electrical stimulation threshold of the ventricle during diastole

PRIMARY INDICATIONS

- Treatment and prophylaxis of life-threatening ventricular arrhythmia.
- Acute management of:
 - Ventricular Tachycardia
 - Ventricular Fibrillation

CONTRAINDICATIONS

- Known history of hypersensitivity (allergy) to amide local anaesthetics
- Lignocaine should not be used intravenously in patients with Stoke-Adam's syndrome or with severe degrees of sinoatrial, atrioventricular or intraventricular block (unless patient has an artificial pacemaker)

PRECAUTIONS

- Use cautiously in patients with known drug allergies or sensitivities
- Hypovolaemia and shock, all forms of heart block, epilepsy, hepatic or renal disease, cardiac failure, severe respiratory depression
- Multidose vials should not be used for IV administration
- Doses may need to be reduced in the elderly

ROUTE OF ADMINISTRATION

- Intravenous injection/infusion

SIDE EFFECTS

- CNS symptoms: light-headedness; drowsiness; dizziness; apprehension; euphoria; tinnitus; blurred/double vision; vomiting; sensations of heat, cold or numbness; twitching; tremors; convulsions; unconsciousness; respiratory depression and arrest
- Hypotension; cardiovascular collapse; and bradycardia which may lead to cardiac arrest
- Allergic reactions

SPECIAL NOTES

- Constant ECG monitoring is necessary during IV administration

DOSE

Adult:

Loading Dose:

50 to 100 mg IV (1 mg/kg bodyweight) give over one to two minutes.

A second dose may be given after 5 minutes.

Maintenance Dose:

Should be commenced within 10 minutes

2 g Lignocaine in 500 mL 5% Dextrose (1 mL=4 mg)

Run at :

4 mg/min (60 mL/hr) for first hour

3 mg/min (45 mL/hr) for second hour

2 mg/min (30 mL/hr) thereafter.

Note:

As Lignocaine has a fairly slow rise to therapeutic concentrations, it may be necessary to follow the initial loading dose with a further two injections of Xylocard 100 (1 mg/kg bodyweight) at 15 to 20 minute intervals.

No more than 200 to 300 mg Lignocaine should be administered in a one hour period.

Children:

Experience is limited. Suggested dose:

Loading dose:

0.5 to 1 mg/kg repeated if necessary up to 3 to 5 mg/kg followed by continuous infusion of 10 to 50 microgram/kg/minute.

LIGNOCAINE HYDROCHLORIDE FOR LOCAL ANAESTHESIA**PRESENTATION**

Ampoules	1%	50 mg/5 mL 200 mg/20 mL
	2%	100 mg/5 mL 400 mg/20 mL

PHARMACOLOGY

Lignocaine stabilises the neuronal membrane and prevents the initiation and transmission of nerve impulses, thereby effecting local anaesthetic action.

PRIMARY INDICATIONS

- Production of local or regional anaesthesia by infiltration; for regional IV anaesthesia and nerve blocks (eg. epidural)

CONTRAINDICATIONS

- Known history of hypersensitivity (allergy) to local anaesthetics of the amide type
- Inflammation or sepsis at proposed site of injection.

PRECAUTIONS

- Use cautiously in patients with known drug allergies or sensitivities
- When any local anaesthetic agents are used, resuscitative equipment and drugs including oxygen should be immediately available

ROUTE OF ADMINISTRATION

- Infiltration, nerve block

SIDE EFFECTS

- Use of Lignocaine as a local anaesthetic may result in systemic adverse reactions
- CNS symptoms: light-headedness; drowsiness; dizziness; apprehension; euphoria; tinnitus; blurred/double vision; vomiting; sensations of heat, cold or numbness; twitching; tremors; convulsions; unconsciousness; respiratory depression and arrest
- Hypotension; cardiovascular collapse; and bradycardia which may lead to cardiac arrest
- Allergic reactions

SPECIAL NOTES

- Injection should always be made slowly with frequent aspirations to avoid inadvertent intravascular injection, which can produce cerebral symptoms even at low doses
- For local anaesthetic use, onset of action is rapid and blockade may last from 60 to 90 minutes

DOSE

Local anaesthesia

- Dose varies according to area to be anaesthetised
- The lowest dose needed to provide effective anaesthesia should be administered

Adult:

Dose SHOULD NOT exceed 3 mg/kg (maximum 200 mg).
For spinal anaesthesia the dose SHOULD NOT exceed 100 mg

Children:

Dose SHOULD NOT exceed 3 mg/kg

METOCLOPRAMIDE (EG. MAXOLON[®], PRAMIN[®])**PRESENTATION**

Ampoules	10 mg/2 mL
Tablets	10 mg
Oral solution	1 mg/mL

PHARMACOLOGY

Antiemetic which acts both centrally and peripherally. It stimulates the motility of the upper gastrointestinal tract increasing gastric emptying. It also has central dopamine antagonist activity.

PRIMARY INDICATIONS

Control nausea and vomiting (not of labyrinthine origin)

CONTRAINDICATIONS

- Whenever stimulation of gastrointestinal motility may be dangerous (eg. haemorrhage, obstruction, perforation)
- Pheochromocytoma

PRECAUTIONS

- Hepatic and renal impairment (reduce dose)
- May mask underlying disorders such as cerebral irritation
- May cause acute hypertensive response in pheochromocytoma
- Avoid in Porphyria
- Avoid for 3 to 4 days following gastrointestinal surgery

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Intravenous infusion
- Intravenous injection
- Oral

SIDE EFFECTS

- Dystonic reactions (more frequent in young adults and children and may occur after a single dose)
- Hyperprolactinaemia
- Occasional tardive dyskinesia on prolonged administration
- Drowsiness, dizziness, headache
- Restlessness
- Diarrhoea
- Oculogyric crisis

SPECIAL NOTES

- Intravenous: Initial effect in 1 to 3 minutes
- Intramuscular: Initial effect in 10 to 15 minutes
- Pharmacological effects persist for 1 to 2 hours

DOSE**Adults:**

10 mg, oral, IM or slow IV (over 1 to 2 minutes) every 6 to 8 hours as needed

Young adults and children:

Oral/IM/slow IV 0.15mg/kg every 6 to 8 hours as needed

WITH CAUTION:

The use of Maxolon® in patients under 20 years should be restricted to the following situations:

- severe intractable vomiting of unknown cause
- vomiting associated with radiotherapy and intolerance to cytotoxic drugs

METOPROLOL (EG. BETALOC[®], LOPRESOR[®])**PRESENTATION**

Tablets	50 mg, 100 mg
Ampoule	5 mg/5 mL

PHARMACOLOGY

Cardioselective beta blocker

PRIMARY INDICATIONS

- Oral therapy
- Hypertension
- Angina
- Disturbance of cardiac rhythm, in particular supraventricular tachyarrhythmia
- Suspected or definite myocardial infarction
- Prevention of migraine

CONTRAINDICATIONS

- Reversible airways disease
- Sick sinus syndrome
- Second or third degree atrioventricular block
- Shock
- Severe hypotension
- Uncontrolled heart failure
- Bradycardia (45 to 50 beats/min)
- Bronchospasm

PRECAUTIONS

- Cardiac failure
- Hepatic impairment-may require a lower dose
- May mask signs of hypoglycemia (eg. tremor and tachycardia)
- Severe peripheral vascular disease
- Diabetes mellitus
- Pregnancy and lactation

ROUTE OF ADMINISTRATION

Oral, Intravenous

SIDE EFFECTS

- Nausea
- Diarrhoea
- Bronchospasm
- Dyspnoea
- Bradycardia
- Hypotension
- Heart failure, heart block
- Fatigue, dizziness, abnormal vision

SPECIAL NOTES

Overdose characterised by excessive bradycardia, hypotension and CCF, bronchoconstriction, impairment of consciousness

DOSE

Hypertension:

Oral, initially 50 to 100 mg once daily. Maintenance 50 to 100 mg once or twice daily

Angina:

Oral, initially 25 to 50 mg twice daily. Maintenance 50 to 100 mg 2 to 3 times daily

Tachyarrhythmia:

IV, 5 mg (1 mg/minute) repeated at 5-minute intervals up to a maximum of 20 mg

Oral 50 to 100 mg 2 to 3 times daily

Myocardial infarction:

Initially, 5 mg IV at 5-minute intervals up to a total of 15 mg, then 25 to 50 mg orally every 6 hours for 48 hours.

Maintenance, oral 50 to 100 mg twice daily

Prevention of migraine:

Oral 50 to 75 mg twice daily

MIDAZOLAM (HYPNOVEL®)**PRESENTATION**

Ampoules	15 mg/ 3 mL
	5 mg/ 1 mL
	5 mg/ 5 mL
	50 mg/ 10 mL

PHARMACOLOGY

Midazolam is a benzodiazepine; it is a short acting CNS depressant that induces sedation, hypnosis, amnesia and anaesthesia

PRIMARY INDICATIONS

- Conscious sedation prior to various procedures
- Induction of anaesthesia
- Pre-operative sedation
- Sedation in intensive care setting

CONTRAINDICATIONS

- Myasthenia gravis
- Hypersensitivity to benzodiazepines
- Shock or coma
- Acute alcoholic intoxication with depression of vital signs
- Acute narrow angle glaucoma
- Pregnancy

PRECAUTIONS

- Patient should be continuously monitored for early signs of under-ventilation or apnoea
- Should not be administered by rapid or single bolus intravenous administration
- Patients with chronic obstructive pulmonary disease are unusually sensitive to the respiratory depressant effect
- Low doses are required in the elderly and in patients with renal or hepatic insufficiency

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Intravenous injection or infusion. IV should only be used where appropriate equipment and personnel are available for continuous monitoring of cardiorespiratory function and for resuscitation

SIDE EFFECTS

- Respiratory depression, apnoea
- May decrease the sensitivity of the ventilatory response to elevated CO₂ tension
- Cardiac arrest has occurred after IV injection

SPECIAL NOTES

IM dosing: onset of action within 15 minutes, peaking at 30 to 60 minutes

IV : maximum sedation occurs after 2 to 3 minutes

DOSE

Should be individualised and administered slowly

Conscious sedation:

Adult:

2.5 mg initial dose IV with further doses of 1 mg if required.
Doses greater than 5 mg not usually required (Initial dose of 1 mg IV for elderly or severely ill patients)

Induction of anaesthesia:

0.15 to 0.35 mg/kg (10 to 15 mg) with maximum sedation after 2 to 3 minutes

IM dosing (to induce sleepiness or drowsiness)

0.07 to 0.08 mg/kg (approximately 5 mg) for healthy patient less than 60 years

Acute behavioural disturbance:

5mg IM or 0.1mg/kg if patient < 50kg

MORPHINE SULPHATE

PRESENTATION

10 mg in 1 mL ampoule
15 mg in 1 mL ampoule
30 mg in 1 mL ampoule
(Oral formulations available)

PHARMACOLOGY

A narcotic analgesic

Actions:

On the Central Nervous System:

- depression - leading to analgesia
- respiratory depression
- depression of cough reflex
- stimulation: changes in mood, euphoria or dysphoria;
vomiting; pinpoint pupils
- dependence (addiction)

On the Cardiovascular System:

- vasodilatation
- depresses the rate of AV node conduction

PRIMARY INDICATIONS

- Severe pain
- Pain of acute myocardial infarction
- Acute pulmonary oedema
- Burn injuries

- Isolated peripheral limb injury with clearly no evidence of actual or potential head, neck or trunk trauma
- Other musculo-skeletal trauma after consultation

CONTRAINDICATIONS

- Acute asthma
- Respiratory depression
- Known hypersensitivity
- Acute alcoholism/delirium
- Avoid in potential or actual raised intracranial pressure or head injury
- Patient taking Monoamine Oxidase Inhibitors within previous 14 days
- Severe renal / hepatic disease

PRECAUTIONS

- Respiratory depression, eg. COAD
- Elderly patients
- Hypotension (give fluid therapy first)
- Abdominal pain prior to consultation with doctor
- Facial and/or respiratory tract burns
- Actual or potential head, neck or trunk injuries
- Known addiction to narcotics

ROUTE OF ADMINISTRATION

- Intravenous injection
- Subcutaneous injection
- Intramuscular injection
- Intraosseous injection

SIDE EFFECTS

- Nausea, vomiting, sweating, facial flushing
- Respiratory depression
- Euphoria
- Pinpoint pupils
- Hypotension
- Drowsiness
- Bradycardia
- Constipation, urinary retention
- Confusion, restlessness, mood changes

SPECIAL NOTES

- Morphine is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled and may lead to dependency
- Side effects from Morphine can be reversed with Naloxone (Narcan®)
- Intravenous: Initial effect in 2 to 5 minutes; maximal effect 20 minutes; duration of effect 2.5 to 7 hours
- IM: peak analgesia in 30 to 60 minutes
- SC: peak analgesia in 50 to 90 minutes

DOSE (See ANALGESIA REGIMEN) 227

Adult:

- 0.1 mg/kg IM or S/C
- 2.5 mg IV until comfortable to a maximum of 10 mg (Give at 2mg/minute)

Children:

- 0.1 mg/kg IV (total dose)
- Can give ¼ the total dose at a time by IV bolus
- IM/SC 0.1 mg/kg

NALOXONE (NARCAN®)**PRESENTATION**

Ampoules (adult)	400 mcg/ mL, 1 mL
Ampoules (neonatal)	20 mcg/ mL, 2 mL
Syringe	400 mcg/5 mL (Min-I-Jet)

PHARMACOLOGY

Pure opiate antagonist which reverses the effects of narcotics

PRIMARY INDICATIONS

- Complete or partial reversal of narcotic depression, including respiratory depression
- Diagnosis of suspected acute opioid overdose

CONTRAINDICATIONS

Known hypersensitivity

PRECAUTIONS

- If the patient is known to be physically dependent on narcotics, be prepared to deal with a combative patient after administration
- Caution in patients with pre-existing cardiac disease

ROUTE OF ADMINISTRATION

- Intramuscular
- Intravenous (adults, children and neonates)
- Subcutaneous (neonates)

SIDE EFFECTS

- Abrupt reversal of narcotic depression has been reported to result in:
 - nausea, vomiting
 - sweating
 - tachycardia
 - tremor
 - hyperventilation
- Excessive dosage of Naloxone may also result in:
 - excitement
 - increased blood pressure
 - significant reversal of analgesia

SPECIAL NOTES

- Since the duration of action of Naloxone is short, depending on the dose of narcotic used, repeated doses and careful monitoring of the patient are required
- Intravenous: Initial effect in 1 to 2 minutes; duration of effect 30 to 45 minutes
- Intramuscular: Initial effect in 2 to 5 minutes

DOSE**Adult: (For suspected opioid overdose)**

0.4 to 2 mg IV every 2 to 3 minutes as necessary
(maximum 10 mg)

Children:

10 microgram (0.01mg)/kg bodyweight IV. If not effective
a subsequent dose of 100 microgram(0.1mg)/kg may
be given

Neonates:

10 microgram (0.01mg)/kg (maximum 2 mg) IV/IM/SC as
single dose then repeated every 2 to 3 minutes as
necessary OR 0.06mg/kg stat IM at birth

IV infusion:

Can be diluted by adding Naloxone 2 mg to 500 mL
Normal Saline or Glucose 5% (4 microgram/ mL solution).
Rate should be titrated to patient's response

TOCOLYTIC THERAPY - NIFEDIPINE (ADALAT®)

PRESENTATION

Tablets 10 mg and 20 mg

PHARMACOLOGY

Calcium channel blocker, which relaxes cardiac muscle and also the smooth muscle of the uterus and inhibits both prostaglandin and oxytocin-induced contractions.

Nifedipine has similar tocolytic activity to betamimetics such as Salbutamol but a lower incidence of maternal side effects. Fetal and neonatal outcomes are significantly improved when Nifedipine is compared with Salbutamol, with lower rates of respiratory distress syndrome, intracranial haemorrhage and perinatal mortality. There is some evidence that Nifedipine can be used safely for extended periods.

PRIMARY INDICATIONS

- Hypertension and angina
- Preterm labour (accepted but not a registered indication*)

The decision to suppress labour with tocolytic medication is to be made on the advice of a medical officer. Decisions to change tocolytic medication should also be made by a medical officer.

CONTRAINDICATIONS

- Where conditions exist which contraindicate any suppression of labour including antepartum haemorrhage, pre-eclampsia, chorioamnionitis and fetal distress
- Cardiac disease (cardiac conduction defects and LVF)
- Hypotension
- Concomitant use of betamimetics such as Salbutamol
- Concomitant use of Magnesium Sulphate. This is not an absolute contraindication but care must be taken as hypotension may result. A patient being treated with Nifedipine should not be given a bolus of Magnesium Sulphate

EXPECTED ACTION

Onset of tocolysis is expected between 30 and 60 minutes. Therefore, institution of alternative tocolysis should not be considered in the first 2 hours. If contractions do not abate after this time, another tocolytic may be considered by the advising medical officer.

PREREQUISITE CARE

- Insert an IV
- Obtain baseline electrolytes, urea and creatine and LFT levels

ROUTE OF ADMINISTRATION

Oral

DOSE

- Initial dose 20mg Nifedipine orally (not slow-release Nifedipine)
- If contractions persist after 30 minutes, give another 20mg oral dose
- If still contracting after a further 30 minutes, follow up with a further 20mg orally
- If BP is stable, a maintenance dose of 20mg tds for 48 to 72 hours may be given where indicated

Notes:

- The maximum dose of Nifedipine is 120mg/day.
- After 72 hours, if maintenance therapy is required, patients can be changed over to Adalat Oros (long-acting) 30 to 60 mg orally/day.
- In contrast to betamimetics, Nifedipine does not induce tachyphylaxis, so maintenance therapy may be prescribed

OBSERVATIONS

- Half-hourly maternal pulse, BP and respiratory rate until contractions cease
- Continuous electronic fetal heart rate monitoring is indicated until contractions have settled

SIDE EFFECTS

- Facial flushing
- Headache
- Nausea
- Tachycardia
- Dizziness
- Hypotension - unusual in normotensive patients
- Cardiac failure
- Increase in liver enzymes

MANAGEMENT

Treat maternal hypotension with IV fluids in the first instance.

*Note: This is the protocol as provided by King Edward Memorial Hospital 2004

REFERENCE

King JF, Flenady V, Papatsonis D, Dekker G, Carbonne B. 2003. Calcium channel blockers for inhibiting preterm labour; a systematic review of the evidence and a protocol for administration of nifedipine. Australian & New Zealand Journal of Obstetrics & Gynaecology. 43:3:192-8

OLANZAPINE (ZYPREXA®)**PRESENTATION**

Ampoules	10mg vial (powder for injection)
Tablets	2.5mg, 5mg, 7.5mg, 10mg
Wafers	5mg, 10mg

PHARMACOLOGY

Atypical antipsychotic, antimanic and mood stabilising agent.

PRIMARY INDICATIONS

- Schizophrenia and related psychosis
- Acute mania
- Behavioural and psychological symptoms in dementia (IM only)

CONTRAINDICATIONS

Prostatic enlargement, paralytic ileus, narrow angle glaucoma may be exacerbated by anticholinergic activity of Olanzapine.

PRECAUTIONS

May elevate blood glucose levels, glaucoma, renal hepatic impairment, elderly (esp >80yrs), sedation concomitant, benzodiazepines, pulmonary conditions.

ROUTE OF ADMINISTRATION

Oral
Intramuscular (NOT IV or SC)

SIDE EFFECTS

- Drowsiness
- Orthostatic hypotension
- Peripheral oedema
- Dry mouth
- Hyperglycemia
- Weight gain
- Extrapramidal side effects and agitation (rare)

SPECIAL NOTES

Monitor for cardiovascular effects especially after IM injection.

DOSE**Agitation**

5 to 10mg orally

IM 5 to 10mg followed if necessary by further doses of up to 10mg at 2 and 6 hours after initial dose. MAXIMUM 30mg in 24 hours. IM in dementia, 2.5mg followed if necessary by 5mg at 2 and 6 hours. Max 12.5mg in 24 hours.

OXYTOCIN (SYNTOCINON®)

PRESENTATION

Ampoules	5 IU/ 1 mL
	10 IU/ 1 mL

PHARMACOLOGY

Oxytocin stimulates the smooth muscle of the uterus, producing rhythmic contractions. It also causes contraction of the myoepithelial cells surrounding the mammary alveoli.

PRIMARY INDICATIONS

- Induction of labour
- Inadequate uterine effort
- Management of third stage of labour
- Postpartum haemorrhage

CONTRAINDICATIONS

- Fetal distress
- Cephalopelvic disproportion
- Abnormal presentation
- Excessive distension of the uterus
- Parity greater than four
- Elderly multiparae
- Previous caesarean section
- Severe toxemia
- Placenta previa

PRECAUTIONS

- The induction of labour by means of oxytocic agents should be attempted only when strictly indicated for medical reasons
- When Syntocinon® is used for the management of the third stage of labour, multiple pregnancy must be excluded before the drug is injected

ROUTE OF ADMINISTRATION

- For the induction or enhancement of labour, Syntocinon® should only be given as an intravenous infusion
- In the third stage of labour and puerperium (haemorrhage, etc), a slow intravenous injection or intravenous infusion may be given

SIDE EFFECTS

- Hypotension
- Tachycardia
- Water intoxication

SPECIAL NOTES

- Compatibility of Syntocinon® has been demonstrated with 0.9% normal saline and 5% dextrose solutions. The use of 5% dextrose in water is not recommended, however
- Refrigerate ampoules

DOSE***Induction of labour***

IV infusion only: (recommended dilution is 10 IU per litre of fluid). Initial infusion rate 1 to 4 mU/minute (0.1 to 0.4 mL/minute of diluted fluid). Rate can be increased at 20 minute intervals to a maximum of 2 mL/minute.

Augmentation of labour

Use lower-end of dosage range as above

Third stage labour and puerperium

5 to 10 IU IM or 5 IU slowly IV. If given by infusion to induce labour, the infusion should be continued through third stage

Caesarean section

5 IU intramurally after delivery of the fetus (within the wall of the uterus)

PARACETAMOL (EG. PANADOL[®], PANAMAX[®], DYMADON[®])

PRESENTATION

Tablets, Caplets, Capsules	120 mg, 250 mg, 500 mg
Elixir, suspension	24 mg/ mL 48 mg/ mL 50 mg/ mL 100 mg/ mL
Suppositories	125 mg, 250 mg, 500 mg
Controlled release tablets	665 mg

PHARMACOLOGY

Analgesic and antipyretic (no anti-inflammatory effects)

PRIMARY INDICATIONS

Relief of mild to moderate pain and fever

CONTRAINDICATIONS

Administration to infants less than 1 month is not recommended

PRECAUTIONS

Use with caution in patients with hepatic or renal dysfunction

ROUTE OF ADMINISTRATION

- Oral
- Rectal (suppositories)

SIDE EFFECTS

Reports of adverse reactions are rare. The following reactions have been reported, though no causal relationship has been confirmed:

- dyspepsia
- nausea
- allergic reaction
- haematological reaction

Toxic symptoms include vomiting, abdominal pain, hypotension and sweating. The most serious adverse effect of acute overdosage of paracetamol is a dose dependent, potentially fatal hepatic necrosis.

DOSE

Adult:

500 mg to 1g every 3 to 6 hours (maximum 8 tablets per 24 hours)

Children:

15 mg/kg bodyweight every 4 to 6 hours. DO NOT administer more than 4 times in 24 hours

PETHIDINE HYDROCHLORIDE

PRESENTATION

Ampoules	25 mg/ 1 mL
	50 mg/ 1 mL
	75 mg/ 1 mL
	100 mg/ 2 mL
Vials	500 mg/ 10 mL
Medi-ject	500 mg/ 50 mL
(tablets 50mg also available)	

PHARMACOLOGY

Pethidine is a synthetic opioid analgesic that produces a pattern of effects similar to morphine

PRIMARY INDICATIONS

- Relief of moderate to severe pain (medical and surgical)
- Preanaesthetic medication
- Obstetrical analgesia

CONTRAINDICATIONS

- Respiratory depression, or where respiratory reserve is depleted
- Head injury, raised intracranial pressure, brain tumour
- Acute bronchial asthma, chronic airway disease
- Cardiac arrhythmias

- Concurrent use of Monoamine Oxidase Inhibitors (within previous 3 weeks)
- Convulsive states (due to stimulatory effects of Pethidine on the spinal cord)
- Diabetic acidosis (with danger of coma)
- Acute alcoholism or delirium tremens
- Severe hepatic disease
- Hypersensitivity to Pethidine

PRECAUTIONS

- Use with caution in patients taking other CNS depressant drugs
- Patients with severe pain may tolerate very high doses of Pethidine but may exhibit respiratory depression should their pain suddenly subside
- Elderly patients demonstrate an increased sensitivity to narcotics
- Do not use in cardiac infarction (causes transient increase in blood pressure and increased heart rate)
- May aggravate pre-existing convulsions in patients with a convulsive disorder
- Use with extreme care in pre-eclampsia and eclampsia
- If used in obstetrics, must observe infant carefully for respiratory depression. Avoid in neonates

- Repeated doses (especially in renal dysfunction) may cause accumulation of metabolite-causing seizures
- Use with caution in patients with prostatic hypertrophy/urethral stricture

ROUTE OF ADMINISTRATION

- Intramuscular injection
- Intravenous injection
- Subcutaneous injection

SIDE EFFECTS

- CNS symptoms: disorientation, bizarre feelings, hallucinations, psychosis, drowsiness, malaise
- Nausea and vomiting; constipation
- Orthostatic hypotension

SPECIAL NOTES

- Narcotic analgesic overdose usually produces CNS depression ranging from stupor to a profound coma; respiratory depression; cold clammy skin and/or hypothermia; flaccid skeletal muscles; bradycardia and hypotension
- In therapeutic doses the primary concern is respiratory depression which may be reversed with Naloxone

- After IM administration Pethidine 75 to 100 mg has comparable analgesic, euphoric and respiratory depressant effects to Morphine 10 mg, Codeine 120 mg, Fentanyl 200 microgram and Methadone 8 to 10 mg
- Pethidine is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled and may lead to dependency

DOSE

Adult:

- IV bolus (if possible)
25 mg until comfortable or to a maximum of 100 mg
- IM- 1 mg/kg/dose

Children:

- IV bolus (if possible)
Up to 1 mg/kg (total dose)
Can give ¼ the total dose at a time by IV bolus
- IM- 1 mg/kg

PROCHLORPERAZINE (STEMETIL®)**PRESENTATION**

Tablets	5 mg
Suppositories	5 mg, 25 mg
Ampoules	12.5 mg/mL, 1 mL

PHARMACOLOGY

Prochlorperazine is a Phenothiazine that acts on several neurotransmitter systems. It possesses strong antiemetic and anti-psychotic activity with less sedative action than Chlorpromazine.

PRIMARY INDICATIONS

- Nausea and vomiting due to various causes including migraine
- Vertigo due to Meniere's syndrome, labyrinthitis and other causes

CONTRAINDICATIONS

- Circulatory collapse
- CNS depression (coma or drug intoxication)
- Previous history of hypersensitivity reaction to Phenothiazines
- Bone marrow depression

PRECAUTIONS

- Avoid in patients with renal dysfunction, Parkinson's disease, hypothyroidism, Pheochromocytoma, myasthenia gravis, prostate hypertrophy

- Use with care in elderly patients, epileptic patients
- Avoid use in pregnancy
- Do not use in children under 10 kg or less than 2 years, as acute extrapyramidal reactions are more likely to occur.
- Stemetil should NOT be given to children by the rectal or intramuscular route

ROUTE OF ADMINISTRATION

- Oral
- Deep intramuscular injection
- Rectal suppository

SIDE EFFECTS

- Constipation
- Dry mouth
- Drowsiness
- Akathisia
- Parkinsonism
- Blurred vision
- Hypotension

SPECIAL NOTES

Prochlorperazine can cause very serious dystonic reactions in children leading to cyanosis from laryngospasm, apnoea requiring artificial ventilation, life-threatening tetanus-like syndromes, coma and even death. These reactions can occur with a single therapeutic dose. Treat with Benztropine (Cogentin) (Adults 1 to 2 mg IM and children 0.2 mg IM initially, with increments if required)

DOSE

Adult:

Oral 5 to 10 mg 2 to 3 times daily
Deep IM 12.5 mg or
Suppository 25 mg

Children: (see precautions with Special Notes)

Oral 250 mcg/kg bodyweight, 2 to 3 times daily

PROMETHAZINE (EG. PHENERGAN®)**PRESENTATION**

Tablet	10 mg, 25 mg
2 mL ampoule	50 mg/2 mL
Elixir	5 mg/ 5 mL

PHARMACOLOGY

- Phenothiazine derivative
- Potent long-lasting antihistamine (H1 receptor antagonist) with the following actions:
 - antiallergy
 - antiemetic
 - anti-motion sickness
 - anticholinergic
 - sedative (usual effect at therapeutic doses)

PRIMARY INDICATIONS

- Treatment of allergic reactions
- Treatment of nausea and vomiting
- Preanaesthetic medication (usually in conjunction with an opiate analgesic and atropine)

CONTRAINDICATIONS

- High doses of other CNS depressants
- Coma
- Jaundice induced by Phenothiazines
- Subcutaneous administration
- Children <2yrs

PRECAUTIONS

- Hypertensive crisis
- Epilepsy
- Narrow angle glaucoma
- Prostatic hypertrophy
- Cardiovascular disease
- Impaired hepatic, respiratory function
- Obstructive GI or urinary tract condition
- Pregnancy and lactation
- Children
- Elderly

ROUTE OF ADMINISTRATION

- Oral
- Intravenous injection
- Deep intramuscular injection

SIDE EFFECTS

- Pronounced sedative effects (confusion, disorientation)
- Oculogyric crisis
- Excitation, nervousness, hysteria
- Tremors, seizures
- Catatonic-like states

SPECIAL NOTES

- Promethazine should not be administered by subcutaneous or intra-arterial injection
- Avoid extravasation
- Onset of antihistaminic effects occur 20 minutes after IM injection and 3 to 5 minutes after IV injection
- The duration of sedative effects may range from 2 to 8 hours depending on the dose and route of administration

DOSE

Allergic conditions

Adult:

25 to 50 mg by deep IM or slow IV maybe repeated within 2 hours (maximum 150 mg daily)

Antiemetic

Adult:

12.5 mg to 25 mg IM or IV every 4 hours

Children (5 to 12 years):

12.5 mg IM

Sedative/hypnotic

Adult:

25 to 50 mg IM or IV

Children (if oral route not possible):

Up to 12 months- 2.5 to 5 mg IM

1 to 5 years- 7.5 to 10 mg IM

6 to 10 years 10 to 12.5 mg IM

SALBUTAMOL (EG. VENTOLIN[®], RESPOLIN[®], ASMOL[®])**PRESENTATION**

Nebules	2.5 mg/2.5 mL
Nebules	5 mg/2.5 mL
Respirator solution	5 mg/1 mL
Ampoules	500 mcg/ mL
Ampoules (Obstetric)	5 mg/5 mL

PHARMACOLOGY

A selective beta2-adrenoreceptor stimulant which causes bronchodilation. It also relaxes smooth muscle of the uterus

PRIMARY INDICATIONS

- Asthma and other conditions associated with reversible airway obstruction
- Premature labour

CONTRAINDICATIONS

- Hypersensitivity
- Severe pre-eclampsia, antepartum haemorrhage
- Intrauterine fetal death
- Concurrent use with Nifedipine can cause serious cardiovascular adverse effects

PRECAUTIONS

- Hyperthyroidism
- Myocardial insufficiency
- Arrhythmias
- Hypertension
- Elderly patients
- IV administration to diabetics (monitor blood glucose)

ROUTE OF ADMINISTRATION

- Inhalation of nebulised solution
- Intravenous injection
- Intravenous infusion
- Subcutaneous
- Intramuscular

SIDE EFFECTS

- Fine tremor (usually hands)
- Headache
- Peripheral vasodilatation
- Tachycardia
- Hypokalaemia after high doses
- Increased heart rate

SPECIAL NOTES

- Inhalation: initial effect 5 minutes; maximal effect 15 to 50 minutes
- Intravenous: initial effect 1 to 2 minutes; maximal effect 30 to 60 minutes

DOSE

Obstetric (IV infusion only)

Premature labour- 10 to 45 microgram/ minute (start at 10 microgram/minute and increase at 10-minute intervals. Maternal heart rate should be monitored)

S/C

Adult:

500 microgram every 3 to 4 hours if required

IM

Adult:

500 microgram every 3 to 4 hours if required

Children:

(2 to 12 years) 10 to 20 microgram/kg/dose repeated every 4 to 6 hours

IV

Adult:

200 to 300 microgram injected over 1 minute and repeated after 15 minutes if required

Children (2 to 12 years):

50 to 200 microgram injected over 1 minute and repeated after 15 minutes if required

Infusion

Adult:

Starting dose of 5 microgram/minute with dose increased to 10 to 20 microgram/minute (loading dose of 200 microgram may be given)

Children (2 to 12 years):

Loading dose of 5 to 7.5 microgram/kg followed by infusion at rate of 5 to 7.5 microgram/kg/hour

Nebulised

Adult:

5 mg

Children (4 to 12 years):

2.5 mg

(under 4 years) 0.1mg/kg

SODIUM BICARBONATE

PRESENTATION

Ampoule	8.4%	10 mL
Vial	8.4%	100 mL
Minijet Syringe	8.4%w/v	50 mL

*8.4% is equivalent to sodium 1 mEq/mL, bicarbonate 1 mEq/mL

PHARMACOLOGY

Sodium bicarbonate is a systematic alkalinising agent. When given intravenously, increases plasma bicarbonate, buffers excess hydrogen ion concentration, raises blood pH and reverses the clinical manifestations of acidosis.

PRIMARY INDICATIONS

- Treatment of metabolic acidosis
- Increase urinary pH
- Severe diarrhoea (if significant bicarbonate loss)

CONTRAINDICATIONS

- Renal failure
- Respiratory or metabolic alkalosis
- Hypoventilation
- Hypernatraemia
- Hypertension
- Oedema
- Congestive heart failure
- Hypokalaemia, hypocalcaemia

PRECAUTIONS

Sodium bicarbonate is incompatible with acids, acidic salts and many alkaloid salts. It should not be mixed with calcium or magnesium salts as this may result in precipitants. Do not mix with other drugs as incompatibilities frequently occur.

ROUTE OF ADMINISTRATION

Intravenous
Intravenous infusion

SIDE EFFECTS

- Alkalosis
- Hypokalaemia
- Hyperirritability or tetany may occur

SPECIAL NOTES

- Accidental extravascular injection of hypertonic solutions may cause vascular irritation and sloughing.
- Do not use unless solution is clear. Discard any unused solution.
- Administration of this drug to children undergoing cardiopulmonary resuscitation may worsen respiratory acidosis

DOSE

Cardiac arrest

Adult:

An initial dose of 1 mL/kg may be given, followed by 0.5 mL/kg at intervals of 10 minutes of arrest as needed.

Children greater than or equal to 2 years of age:

1 mL/kg slow IV

Infants up to 2 years of age:

4.2% solution is recommended for IV administration up to a maximum of 8 mmol/kg/day.

To produce 4.2% solution, dilute 8.4% solution with equal amount of dextrose 5%.

SODIUM CHLORIDE 0.9% (NORMAL SALINE)**PRESENTATION**

Infusion 100 mL, 250 mL, 500 mL, 1000 mL

PHARMACOLOGY

An isotonic solution containing sodium chloride 0.9% in water

PRIMARY INDICATIONS

- For restoring the loss of water and electrolytes (ie. sodium and chloride ions) as required by the clinical condition of the patient
- As a vehicle for the administration of intravenous drugs

PRECAUTIONS

- Impaired renal function
- Pre-eclampsia
- Very young and elderly patients
- Peripheral or pulmonary oedema
- Decompensated cardiovascular system
- Cirrhotic disease
- Nephrotic disease
- In patients receiving corticosteroids or drugs causing sodium retention
- Congestive heart failure

ROUTE OF ADMINISTRATION

Intravenous infusion

SIDE EFFECTS

- Thrombophlebitis
- Excessive amounts may cause hypokalaemia and acidosis, hypernatraemia

DOSE

Should be calculated based on clinical and laboratory data

SUXAMETHONIUM CHLORIDE

PRESENTATION

Ampoule 100 mg/2 mL

PHARMACOLOGY

Ultrashort-acting depolarising neuromuscular blocking drug

PRIMARY INDICATIONS

Skeletal muscle relaxation in anaesthesia
(rapid onset, short-acting)
eg. endotracheal intubation

CONTRAINDICATIONS

- Allergy to Suxamethonium
- Personal or family history of malignant hyperthermia
- Muscular dystrophies, congenital myopathies
- Neurological disease involving extensive muscle wasting

PRECAUTIONS

- Acute narrow angle glaucoma
- Myasthenia gravis
- Pheochromocytoma
- Renal impairment

ROUTE OF ADMINISTRATION

Intravenous
Intramuscular (rare)

SIDE EFFECTS

- Muscle fasciculations
- Postoperative muscle pains
- Bradycardia (particularly with repeated dosing)
- Excessive salivation
- Increased intraocular, intracranial, intragastric pressures
- Bronchospasm
- Jaw rigidity
- Hyperkalaemia
- Arrhythmias
- Malignant hyperthermia (rarely)

SPECIAL NOTES

- IV- onset of action 30 to 60 seconds and lasts for 3 to 5 minutes
- IM onset of action in 3 minutes and lasts 10 to 30 minutes
- After high or repeated doses, the depolarising block can change to non-depolarising, which may be prolonged. Mechanical ventilation and anaesthesia may be needed until recovery. May consider reversal with Atropine or Neostigmine
- Plasma cholinesterase deficiency may lead to altered responses
- Has no effect of consciousness, pain threshold or cerebation. It should therefore be used with adequate anaesthesia

DOSE**Adult***Intubation:*

IV bolus 0.6 mg/kg (0.3 to 1.1 mg/kg) over 10 to 30 seconds produces muscle relaxation in about 60 seconds and lasts four to six minutes.

Prolonged procedure:

IV infusion at rate of 2.5 to 4.3 mg/min
Dilute to 0.1 to 0.2% (1 to 2 mg/mL) in glucose 5% or sterile isotonic solution.
IM: No venous access - 2.5 mg/kg total should not exceed 150 mg

Child

Neonates and children may be resistant to Suxamethonium
IV dose: 1 to 2 mg/kg may result in severe bradycardia or asystole - usually second dose. Pretreat with Atropine to decrease risk.
Infusion not considered safe.
IM: No venous access.

THIAMINE

PRESENTATION

Tablets	100 mg
Injection	100 mg/mL

PHARMACOLOGY

Thiamine (Vitamin B) is an essential water soluble B group Vitamin associated with carbohydrate metabolism

PRIMARY INDICATIONS

- Prevention and treatment of vitamin B₁ deficiency syndromes including beri-beri, Wernicke's encephalopathy and peripheral neuritis associated with pellagra or neuritis of pregnancy (if associated with severe vomiting)
- In acute alcohol withdrawal syndrome to prevent Wernicke's encephalopathy

CONTRAINDICATIONS

- Known sensitivity to Thiamine or benzyl alcohol
- Children less than 2 years due to benzyl alcohol content

PRECAUTIONS

- Serious hypersensitivity reactions have been reported including pruritus, urticaria, sweating, nausea, tightness in the throat, angioedema, respiratory distress, pulmonary oedema, GI bleeding, transient vasodilation and hypotension, vascular collapse and death. A sensitivity

history should be taken from the patient prior to administration of Thiamine (an intradermal test dose should be given to patients with suspected sensitivity)

- Give parenteral Thiamine before glucose to patients at risk of alcohol-related Thiamine deficiency (administration before may precipitate Wernicke's encephalopathy)

ROUTE

Oral, subcutaneous, intramuscular, slow intravenous (over at least 10 minutes)

ADVERSE REACTIONS

- Anaphylaxis (rare). These reactions can be preceded by sneezing or transient pruritus (see precautions)
- Pain on injection, local irritation (common)

DOSE

Thiamine deficiency

100mg IV/IM, then 100mg orally daily

Prophylaxis of Thiamine deficiency

100mg IV/IM daily for at least 5 days, then 100mg orally daily until no longer at risk

TRAMADOL

PRESENTATION

Tablets	Sustained release	100 mg, 150 mg, 200 mg
Capsule	Immediate release	50 mg
Ampoule		50 mg/1 mL, 100 mg/2 mL

PHARMACOLOGY

Opioid analgesic. Binds to mu opioid receptors and also inhibits reuptake of noradrenaline and serotonin

PRIMARY INDICATIONS

Analgesic for moderate to severe pain

CONTRAINDICATIONS

- Allergy with tramadol
- Intoxication to alcohol
- Pregnancy

PRECAUTIONS

- Renal and hepatic impairment- reduce the dose
- Head trauma
- Acute abdominal conditions

ROUTE OF ADMINISTRATION

- Oral
- Intravenous
- Intramuscular

SIDE EFFECTS

- Nausea and vomiting
- Dizziness
- Headache
- Sweating
- Dry mouth
- Coordination disturbances
- Itch
- Rash

SPECIAL NOTES

Analgesia starts within 1 hour and peaks at about 2 to 4 hours

DOSE

IV/IM

50 to 100 mg every 4 to 6 hours up to a total daily dose of 600 mg

Oral, capsule - Immediate release

50 to 100 mg every 4 to 6 hours when necessary; maximum 400 mg daily

Oral, tablet - sustained release

100 to 200 mg every 12 hours. Should not be used for initial stabilisation

VERAPAMIL

PRESENTATION

Tablet	40 mg, 80 mg, 120 mg, 160 mg, 180 mg CR, 240 mg CR
Capsule	160 mg CR, 240 mgCR
Injection	5 mg/2 mL

PHARMACOLOGY

Calcium channel blocker

PRIMARY INDICATIONS

- Supraventricular tachycardia with AV nodal re-entry
- Atrial fibrillation
- Atrial flutter
- Hypertension
- Angina

CONTRAINDICATIONS

- Cardiogenic shock
- Severe bradycardia
- Sick sinus syndrome,
- Complicated acute myocardial infarction
- 2nd and 3rd heart block

PRECAUTIONS

- Sinus bradycardia
- Renal impairment
- Pregnancy and lactation

ROUTE OF ADMINISTRATION

- Oral
- Intravenous
- Intravenous infusion

SIDE EFFECTS

- Bradycardia
- Peripheral oedema
- Rash
- Flushing
- Developing or worsening CCF

SPECIAL NOTES

Slow IV injections over 2 to 3 minutes

Rapid IV can result in hypotension, bradycardia, heart block and asystole

DOSE***Arrhythmias******Adult:***

Initially IV injection 5mg (over 2 to 3 minutes) repeated after 5 to 10 minutes as required - monitor ECG and BP.
Maintenance, IV infusion 5 to 10mg/hour up to a maximum of 100mg daily or oral 120 to 480mg daily.

Child:

IV injection 0.1 to 0.3mg/kg to a maximum of 5mg, repeat after 30 minutes or follow with infusion of 1.25mg to 5micrograms/kg/minute; oral 1 to 3mg/kg/dose 3 times daily

Hypertension , angina

Adult initially oral 80mg 2 to 3 times daily.
Maximum, 160mg 2 to 3 times daily (short-acting preparation or 240mg once or twice daily (slow-release preparation)

VECURONIUM (NORCURON®)

PRESENTATION

Injection (powder form) 4mg, 10mg

PHARMACOLOGY

Non-depolarising neuromuscular blocker

PRIMARY INDICATIONS

Skeletal muscle relaxation as an adjunct to anaesthesia

CONTRAINDICATIONS

Allergy to Vecuronium

PRECAUTIONS

- Renal and hepatic impairment – action may be prolonged
- Myasthenia gravis
- Use in children

ROUTE OF ADMINISTRATION

- Intravenous
- Intravenous infusion

SPECIAL NOTES

Onset of action 2 to 3 minutes with a duration of 20 to 40minutes

SIDE EFFECTS

Anaphylactic reactions (rare)

DOSE

Adult

IV bolus 0.1mg/kg for intubation, incremental doses

0.02 to 0.04mg/kg

IV infusion, 1 microgram/kg/minute (0.06mg/kg/hour) adjust according to response

Child

IV bolus, 0.1mg/kg for intubation, repeated as required for maintenance

Infant >7 weeks <1 yr

Moderately more sensitive to Norcuron® on a mg/kg basis than adults

Neonates or premature babies

Insufficient information available to allow use in neonates.

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