CLINICAL PRACTICE GUIDELINES FOR AMBULANCE CARE IN WESTERN AUSTRALIA

Paramedic
Industrial Paramedic
Ambulance Officer
Ambulance Transport Officer

Version 11

ST JOHN AMBULANCE AUSTRALIA (Western Australia) Inc.
PREFACE

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AUTHORITY

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GENERAL
1.1 PATIENT ASSESSMENT
November 2007

S.O.A.P. System:

This is one of a number of ways to approach systematically the assessment of a patient.

**Subjective:** Collect relevant information from patient or bystander — what they tell you.

**Objective:** What you find by patient examination.

**Assessment:** What you decide are the major problems needing management, and their priorities.

**Plan:** How you plan to manage these.

**Subjective:**
Decide early whether the problem is primarily **medical** or **trauma**.

**Objective:**
Carry out a **focussed** survey of:

- Environment, surroundings and scene
- Primary Survey
- Vital Signs Survey
- Decide urgency — Time-Critical?
- Secondary Survey

**Assessment:**
Decide what is the main problem(s).

**Plan:**
How are you going to manage the situation — priorities of examination and management?

**Consider the PATIENT in NEED.**
- Respect, kindness, consideration, even though they may be angry, distraught, frightened.
Medical Problems

Focussed enquiry:

- Chief complaint:
  - Onset
  - Quality
  - Quantity
  - Duration — what makes it better or worse
  - Associated symptoms

- Other complaints:
  - Relevant brief past medical history
  - Medic-Alert, relevant allergies
  - Medications that may be relevant

- Survey surroundings:
  - Evidence of neglect
  - Mental dysfunction
  - Family problems

All patients in an ambulance should undergo an assessment of pulse, respirations and coma-score, with a general note of patient condition. This includes ‘transports’. If there are no notes, nothing was done (legally)!
Perform a focused medical assessment

‘SAMPLE’ History (suggested mnemonic):

- Symptoms and Signs
- Allergies (relevant)
- Medications (relevant)
- Pertinent history
- Last meal or drink
- Events leading to

Chief Complaint:
Assess complaints and signs/symptoms `OPQRST`

- Onset
- Pain
- Quality
- Radiates
- Severity
- Treatment? Tablets?

Other Complaints:
- Evaluate as above.
- Survey surroundings for evidence of drug abuse, mental functioning, and family problems.

Medical Problem Management:
General principles include, when appropriate:
- Correct any airway and oxygenation problems, using 100% Oxygen where indicated.
- Recognise and respond promptly to fresh difficulties as they arise.
- Define priorities.
- Maintain clear airway.
- Position patient on side if unconscious.
- Legs elevated for hypovolaemic and neurogenic shock.


Head and chest elevated for respiratory distress.



Position of comfort; pregnant term patients may need to be tilted on to their left
side.



Recognise and manage types of shock.



Reassure patient and provide pain relief as appropriate.



Continue monitoring patient status.



Communicate appropriately and effectively with patient, relatives and
Communications Centre. Inform Communications Centre or appropriate
medical facility of destination where necessary using CPG General 1.9
DeMIST Procedure format.



Anticipate unstable conditions requiring immediate transport.



Determine if Time Critical.

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1.2 Patient History – Medical
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Management of patients with a head injury or neurological illness depends on careful assessment of neurological function (Skill 103).

**Changes** in neurological status are particularly important.

**The first observations** of neurological status in the field provide the basis for monitoring changes in condition. It is therefore important that the first Officer to assess the patient accurately observes and records neurological assessment, using methods which will be followed throughout the patient's care in hospital.

The following are important observations to be made as part of neurological assessment in the field.

Follow and identify changes rapidly. Errors and confusion are minimised when **precise responses to specific stimuli** are recorded. For the same reason, always record specific responses including lack of response. (Do not use terminology like lethargic, semi-comatose, semi-conscious, stuporous)

Observe particularly for adequacy of ventilation; depth, frequency and regularity of respirations.

**Eyes:** Direction of gaze. Size and reactivity of pupils.

**Movement:** Observe whether all four extremities move equally well.

**Sensation:** If patient awake, observe for absent, abnormal or normal sensation at different levels if cord injury suspected.

**Special Note:**
- Sensory and motor examination must be documented before moving patient with suspected spinal injury, whenever possible.
- Note what stimulus is being used when recording responses. Applied stimuli must be adequate to the task but not excessive.

Use a firm squeeze to the trapezius muscle at the base of the neck/shoulder junction, to clearly define your patient's best motor response. Avoid the ear-lobe, or grinding knuckles on the sternum!

Record findings at the scene, any changes and the time (e.g. en route).
# Levels of Consciousness – Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Neurological Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye opening:</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>To pain</td>
</tr>
<tr>
<td>To voice</td>
</tr>
<tr>
<td>Spontaneous</td>
</tr>
<tr>
<td><strong>Best verbal response:</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Incomprehensible words</td>
</tr>
<tr>
<td>Inappropriate words</td>
</tr>
<tr>
<td>Confused</td>
</tr>
<tr>
<td>Oriented</td>
</tr>
<tr>
<td><strong>Best motor response:</strong></td>
</tr>
<tr>
<td>None</td>
</tr>
<tr>
<td>Extension to pain</td>
</tr>
<tr>
<td>Flexion to pain</td>
</tr>
<tr>
<td>Withdraws from pain</td>
</tr>
<tr>
<td>Purposeful movement</td>
</tr>
<tr>
<td>Obey commands</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>
Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.

(Presence of circulation, and possibility of severe bleeding, at this stage.)

Airway Management:

- Open promptly with technique appropriate to situation.
- Patient positioning should protect airway from aspiration of vomitus, i.e. on side, dependent drainage if unconscious. Consider Guedel airway if no gag reflex.
- Administer Oxygen, high concentration or 100%.
- Monitor adequacy of oxygenation during care.
- Assess consciousness, clarity of thought, circulation, colour, oxygen saturation.
- Monitor adequacy and effectiveness of ventilation during care. If inadequate, ventilate.
- Choose effective equipment to ventilate if necessary. Watch rate and tidal volume.
- Consider Advanced Airway Management as per CPG Respiratory 3.5 Advanced Airway Management (if trained and authorised), only if this will result in improved oxygenation.

Suction as needed for patient support:

- Connect apparatus properly.
- To test suction close end of tube with thumb. Should support weight of tube within 5 seconds.

Suction to posterior pharynx and nose only (Not down to vocal cords as this can cause laryngospasm).

Suction no more than 5 seconds at a time unless life threatening obstruction (Can reduce available oxygen very rapidly and lead to hypoxia).
Use adequate ventilation and oxygenation between suction attempts.
Do NOT repeatedly open and close suction, or repeatedly “stab” the catheter. It sounds great, but sucks much less efficiently. Silent suction is strongest.

Allocate priorities – triage:
- Assess potential for deterioration — Time Critical?
- Manage patients in priority order, using all available resources of manpower and equipment.

Triage (in multiple patient situations):
- Assign one Officer to control scene and one to commence triage – crew to remain until all casualties are evacuated or relieved by senior officer.
- Complete triage on all patients before management. Do not immediately start on the apparently most serious until all priorities have been assessed, but do secure airway as you go.
- Categorise patients according to priority and assign personnel to complete assessment and treatment on that basis:
  - Highest Priority:
    - Salvageable life-threatening problems, i.e. airway, breathing difficulties, severe shock, severe medical problems.
  - Second Priority:
    - Burns.
    - Major multiple fractures.
    - Head and spine injuries.
  - Lowest Priority:
    - Minor injuries.
    - Fractures.
    - Pulseless non-breathing patients.
    - Verbally noisy and obviously in distress.
- Minor injuries and fractures can wait.
- Pulseless, non-breathing - more chance of saving others.
- Verbally noisy and distressed - must be fairly okay to be noisy!
Trauma Management — Priority of Injuries:

- Correct airway and oxygenation problems promptly and monitor.
- Recognise and respond promptly to fresh difficulties as they arise and change priorities. Use bystanders to help.
- Recognise and treat forms of shock (prevention of the cause where possible), by fracture immobilisation and effective administration of Oxygen and analgesia.
- Immobilise cervical spine following primary survey if indicated.
- Assess potential for deterioration — Time Critical?
- If Time Critical, essential life-saving care only, before starting transport to a medical facility.
- Perform complete Secondary Survey prior to treatment, except for major bleeding control.
- Dress wounds.
- Immobilise and splint possible fractures prior to movement (unless there is an urgent reason to remove patient rapidly from a dangerous situation.)
- Manage more serious injuries before less serious ones (unless logistic reason for re-ordering priorities).

Patient Movement:

- Do primary and secondary assessment before patient movement (unless grave threat to patient or Officers).
- Monitor airway and protect cervical spine and rest of back carefully while moving.
- Roll or move as a unit. Avoid spinal twisting. Splint prior to movement if possible.
- Perform a smooth and safe transfer to movement device, stretcher and vehicle. Scoop Stretcher where indicated (move very carefully as sudden jolts can cause frighteningly quick drop in blood pressure).
- For all lifts, spread or share the load, by use of all available resources, including safe utilisation of bystanders, to minimise the load on each person and optimise patient movement. Whenever lifting has to be undertaken, use proper body mechanics to minimise rescuer back strain (don’t rush in, then strain your back).
- Move patients as little as possible, consistent with hazards of surroundings.
Extrication:

- Survey scene for potential hazards, number of patients, need for specialist help. Call for medical or technical backup as needed.
- **Protect rescuers first**, ensure hazards are dealt with i.e. fuel spills, power lines and unstable vehicles.
- Perform **primary survey** and treat airway difficulties, severe bleeding first.
- If patient has no pulse or respirations and extrication is necessary before CPR can be provided, patient should be considered dead.
- Triage patients and assign to available personnel.
- Perform a **secondary survey** if possible; splint extremity fractures if possible.
- Expedite safe extrication after management of life-threatening problems (utilising specialists if required).
- Perform or repeat **secondary survey** once patient extricated.
- Remove crushing force as soon as possible. Manage any hypovolaemia.

Teamwork:

- **Team leader** should lead, i.e. co-ordinate and manage scene.
- **Assistant** should follow directions of leader unless dangerous.
- Team should **communicate**; avoid duplication or overlap, share information.
- Assistant should anticipate management needs.

Urgent Transport, PRIORITY 1 for:

- **Internal bleeding**, including gunshots and stabbing (can only be controlled in hospital).
- Tension pneumothorax: rare, but deteriorates rapidly (rapidly increasing breathlessness, engorged neck veins, facial congestion).
- Head injuries with deteriorating levels of consciousness (continuing intracranial bleeding).
- **Cardiac arrest following trauma**. Rarely responds in the field. Often due to internal bleeding or head injury. Outcome is gloomy, but only chance is in hospital. PRIORITY 1 and CPG General 1.9 DeMIST Procedure information to appropriate medical facility.
- **Upper airway obstruction**: Laryngeal injury, airway burns, epiglottitis. Usually PRIORITY 1 and CPG General 1.9 DeMIST Procedure information to appropriate medical facility.
Special Notes:

- **Do not** let gathering of information distract you from initial management, especially with life threatening problems.
- **Appropriate** history taking can provide valuable information while establishing your authority, competence and patient rapport.
- **DO NOT FORGET TO USE BYSTANDERS, CARERS AND RELATIVES** to confirm information from patient and provide facts when patient cannot. You are the only one who can obtain immediate history from the scene.
- Check any medications carried.
- Consider possible **medical** causes for trauma, particularly in single person accidents.
- Patients are **PEOPLE** in NEED.
- They ask for your help, they deserve your **RESPECT**, **KINDNESS** and **CONSIDERATION** in a professional and confidential manner.
GENERAL
1.5 USE OF OXYGEN
September 2008

Use Oxygen often, for injury and illness, it never harms.

Oxygen may be administered by:

- Therapy mask:
  - Adult — up to 10 L/Min. (60%) minimum of 5 L/Min.
  - Child — 5 L/Min.

Because a child has lower lung volumes and inspiratory flow rate, a therapy mask produces a higher inspired percentage of Oxygen than in adults.

High Concentration Mask (Non rebreather 100%) > 8 L/Min, to keep reservoir bag inflated.

Nasal catheter:
- Adult — up to 3 L/Min.
- Child — up to 2 L/Min. Infant — up to 2 L/Min. More than this is very uncomfortable and may blow the off catheter.

Bag valve mask with reservoir bag (BVM) 100% Oxygen

Demand valve — 100% Oxygen

With “Penthrox” inhaler:
- 3 L/Min. = at least 35% Oxygen.
- 8 L/Min. = more than 50% Oxygen.

Supply and Usage:

- "OXY-VIVA" or similar.
- Size C FULL Contains 480 or 490L.
- Duration approx:
  - Resuscitation — demand valve — as little as 15 mins.
  - Demand Valve — breathing — 20-40 mins.
  - Oxy-Viva Mk III preset rate, therapy mask 8 L/min 60 mins maximum duration.
  - Suction uses 50-100 L/min.
  - Continuous suction, 4-8 minutes maximum duration of effective suction.
- Cylinder change at 25% capacity reduces these further.
- Size D FULL — Contents 1640L. Main supply cylinder.
Flow Rate:
- In each case, Oxygen administration should be appropriate to the patient’s needs, and should be increased whenever indicated. Oxygen delivered to the alveoli, and thence to the tissues, is the need.
- 100% Oxygen is never wrong, even in CAL (Chronic Airways Limitation/“COAD”), if patient condition warrants it.

USE OF THE PULSE OXIMETER

Introduction
Pulse oximeters are included in some monitor-defibrillators and portable ones are now issued to all Paramedic staffed vehicles.

It is important to understand the uses and limitations of this device.

The pulse oximeter helps in determining effective patient oxygenation at the measuring point, by measuring the transmission of red and near-infra-red light through arterial beds. The light is absorbed differently by oxyhaemoglobin and reduced haemoglobin.

The % saturation of the haemoglobin with oxygen is derived.

The probe is placed on thin tissue, e.g. finger, toe, ear lobe.

The % of saturated haemoglobin is indicated, together with the pulse rate at the site. This gives an indication of peripheral circulation at that point.

Because of the number of factors influencing the readings, the pulse oximeter should be considered only as a tool to help assessment and management.

False readings may be produced by:
- Moisture on sensor or finger.
- Failure to apply the sensor correctly may reduce the accuracy of the SpO2 measurement.
- Flickering light and motion may affect the readings.
- Hypotension.
- Hypothermia, vasoconstriction.
- Patient use of vaso-constrictive drugs.
- Hypovolaemia or anaemia.
- Nail polish/false nails.
- Jaundice.
- Excessive ambient light.
- Abnormal haemoglobins e.g. carbon monoxide poisoning.
- Cardiogreen and other intravascular dyes, depending on concentration, might affect the accuracy of the SpO2 measurement.
Constricted blood flow to the finger or a finger that is not within size limits of the sensor. **Note:** avoid using the thumb and same arm when using a BP cuff if possible.

### The pulse oximeter:
- Detects peripheral pulsation, counts and displays the pulse rate.
- Determines presence and adequacy of peripheral perfusion.
- Determines the adequacy of current oxygenation method, allowing opportunity for maximising effectiveness to 100%.
- Displays a pulse rate / minute at that site, which can be used for an accurate systolic blood pressure estimation.

### Possible conditions for use:
- Respiratory insufficiency.
- Chronic Airways Limitation.
- Asthma.
- Pulmonary Oedema, congestion.
- Near drowning.
- Irritant inhalation.
- Pneumonia / Bronchitis.
- Unconsciousness.
- Hypovolaemia, shock.
- Trauma.
- Heart attack.
- Bradycardia, arrhythmia.

**Note:**
- A normal oxygen saturation does not mean that 100% Oxygen is not needed.
- A high oxygen partial pressure is necessary to drive the Oxygen into ischaemic, sick and injured tissue.
- Remember that if already giving 100% Oxygen effectively, one can do little else.
- Relief of pain, reduction of cardiac after-load when appropriate and controlling blood loss must all be a part of care.
- When a reading is lower than 98%, re-check Oxygen administration.
- Oxygen saturation changes take 5 minutes to become steady when the inspired oxygen has been increased.
- If Oxygen is decreased or discontinued, the measurement takes 10 minutes to stabilise.
Specific information needed:

- Location, radiation.
- Type of pain.
- Intensity — intermittent or constant.
- Onset.
- What makes it better or worse?
- Relevant medications.
- Associated problems.

Specific physical findings:

- Level of consciousness.
- Potential cause for pain.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Immobilisation/rest (these can be powerful pain reducing manoeuvres).
- **Oxygen**, high concentration or 100% — and appropriate reassurance.
- Vital Signs and oxygen saturation.
- Assess pain level when possible, using a visual analogue then assign a score without telling patient. Note score and time.
- Give analgesia with Oxygen.
- **Note**: Try giving Methoxyflurane first.
- If severe unrelieved pain use Fentanyl.
- If pain is still unrelieved give Ketamine.
- Combination of pain medication can have excellent results.
- Reassess pain score, note.
- **Cardiac pain** — sublingual Isordil as indicated if trained and authorised.
- Where pain is unrelieved from O₂ or Isordil, consider Fentanyl.

Specific precautions / notes:

- Officers may assist by holding analgesic device if appropriate, but may not apply against patient’s wishes at any age.
- **Withdraw analgesia** temporarily if patient becoming drowsy.
- Remember referred pain, e.g. shoulder tip pain, may mean irritation of diaphragm e.g. blood in abdomen.
Assessment of Effectiveness of Pain Management:

- The PAINLOG™ is a measuring device for assessing changes in pain level, assess effectiveness of management.
- This is a visual analogue. Its effectiveness, when used correctly, is well supported by research as a valid tool for measuring perceived change. The patient must visualise their pain level.
- Asking a patient to allocate a number to their pain is not a reproducible method, and has been shown by research to be inaccurate.

Method:

- When appropriate, but before treatment has taken effect:
- Show the PAINLOG™ side of the instrument to the patient, with the pointer set at `No Pain`.
- Ask the patient if there is `No Pain`, or is it the `Worst Pain Ever Imaginable`.
- Then ask the patient to slide the pointer to match the pain level.
- Read the figure on your side between 0-10, don't tell the patient the score.
- Leave the pointer in place. Record the score.

Provide care and pain relieving measures, which may include reassurance, Oxygen, positioning, dressings, splinting, analgesia, Isordil (if trained and authorised).

Offer the PAINLOG™ again, pointer in position of last assessment.
Ask if pain level has changed. Patient is to re-position pointer.

Read revised score and record. Don’t tell patient, but comment can be made e.g. that pain has been eased (if it has!).

The PAINLOG™ ruler can also be used to measure of lacerations etc.
Patients must either consent to treatment, or there must be implied consent, which is considered to have been given if an ambulance has been called, and there is injury or illness, or an unconscious patient.

If a third party has called the ambulance, this does not imply consent for the first party.

Officers have no powers to compel a patient to go to hospital, nor to use force to restrain a patient, except in the protection of themselves or the patient from injuring themselves.

Other than a citizen’s power of arrest, an Officer has no special powers.

If Officers believe that it is in a patient’s best interest that they be taken for medical assessment, they must use all their persuasive powers to try to persuade the patient (consider your Duty of Care and refer to CPG Neurological 2.5 Disturbed Abnormal Behaviour).

In the event of a refusal, if in the professional opinion of the Officer it is important for the patient to go to hospital, because of a risk to their life or well-being, the Officer should contact the police to ask for their assistance. Police Officers have power to compel a person against their will under certain circumstances, by invoking sections of the Mental Health Act 1996 (see details in CPG Neurological 2.5 Disturbed Abnormal Behaviour) and also the Protective Custody Act 2000.

The Protective Custody Act 2000 (authorised Officer is a Police Officer)

Section 6 states:

Intoxicated people may be apprehended.

(1) If an authorised Officer reasonably suspects that a person who is in a public place or who is trespassing on private property —
   a. Is intoxicated; and
   b. Needs to be apprehended —
      i. To protect the health or safety of the person or any other person; or
      ii. To prevent the person causing serious damage to property;
   the Officer may apprehend the person.

Furthermore, Section 10 states:

An apprehended person may be taken for medical examination.

(1) If an apprehended person needs a medical examination, an authorised Officer, as soon as practicable, is to arrange for the person to be medically examined by a suitably qualified person.
(2) The authorised Officer is to continue detaining the apprehended person subject to Section 7 unless —
   a. Under section 29 of the Mental health Act 1996 the apprehended person is referred for examination by a psychiatrist; or
   b. The person who medically examines the apprehended person directs that the person be left in his or her charge.

**Trauma** — particularly head injury.

Officers are to take particular care to assess the potential for a patient to be ‘Time Critical’.

Use of the ‘Time Critical’ criteria is important.

A patient may apparently be uninjured, but careful observation may elicit unusual or abnormal behaviour patterns which may deteriorate with time.

Even in the absence of apparent injury, where there has been the potential for serious injury because of the high energy involved in the injury, patients should be strongly persuaded to go to hospital for initial check up. There have been many cases of delayed or progressive bleeding from internal injuries, which have on occasion proved fatal. In many of these cases there was little apparent injury at the time when the patient was first seen.

Have a high index of suspicion in high energy injuries.

- The **ANR** (Patient Not Transported) and **PCR** forms should be completed in the event of a patient declining transport. This is for the protection of Officers and patient.

- **Document:**
  - Reasons to suspect possibility of significant injury.
  - Appropriate efforts made to persuade the patient to seek medical aid.
  - If the patient has declined.
  - What advice was given to the patient as to the possible consequences?
  - What advice was given to the patient and/or significant others as to what to do in the event of any deterioration?
  - Time spent with the patient in examination and discussion.
GENERAL
1.9 DEMIST PROCEDURE
September 2008
30 Second Trauma Handover
(Brief injury report to team)

1. **PATIENT**
   Sex ...................................Approximate Age........................

2. **Details — Main Problem — Max. 10 words .................................................................**

3. **Mechanism —** (Trauma only)

4. **Injuries — brief —** (Trauma only)

5. **Signs/symptoms. Observations**
   (a) Conscious State — Responds to:
       — Command
       — Pain
       — No response
   b) Pulse ...........................................................................................................
   (c) Systolic BP ...................................................................................................
   (d) Resps .........................................................................................................
   (e) Other important information

6. **Treatment given — main points.................................................................................**
   ................................................................................................................................

7. **NAME, if known.......................................................................................................**
Inter-hospital patient transfers on an emergency basis occur when diagnostic or therapeutic needs of a patient are beyond the capacity of the initial hospital. The patient is potentially unstable, and medical treatment may need to be continued and possibly initiated en route.

All patients should receive initial care to render them as fit as practical for the next transfer, to the extent that it can be provided.

Officers should receive an adequate summary of the patient’s condition, current treatment, possible complications and other pertinent medical information needed for effective patient care in transit. This information should be either in writing or direct verbally from the doctor who is sending the patient. The extent of handover will vary if a doctor escort is accompanying the patient, and accepting responsibility.

**Ensure you have sufficient information to accept responsibility for the care of a patient with an IV running.**

Any patient sick enough for emergency transfer may have at least one IV in place prior to transfer. Instructions for IV maintenance should be provided for the Officer.

Electronic infusion devices may be in use — there are many different types.

- All are designed to maintain a preset flow of intravenous fluid.
- If presented with an IV running, the questions are:
  - What medication if any is in the fluid?
  - What would be the effect if during the journey it ran a little faster?
  - What would be the effect if during the journey it stopped?
- If the effects are likely to be life threatening (rare) an escort may be needed, with the necessary skills and knowledge.
- If not, find:
  - Location of the ‘RESET’ button — if everything beeps or flashes.
  - If that fails, location of the ‘OFF’ button — few patients will come to harm.
Electronic infusion pumps may be managed by Paramedics without the need for an escort provided the Paramedic is comfortable to do so, AND:

- The patient is already on it e.g. not just started at the beginning of the trip.
- Written instructions are given for when it needs to be turned up or down or stopped.
- A tutorial is given (and preferably a printed sheet) on how to adjust rates, turn the alarm off or stop the infusion as required.
- A contact number if there are any issues en route.

Transfer papers (summary, lab work, X-rays, etc.) should be given to the Officer, not to family or friends.

The receiving physician should be contacted by the transferring physician, prior to transfer, so that they are aware when to expect the transfer.

The personnel used to transfer a patient should be appropriate to the treatment needed or anticipated during transfer.

- In order to maintain these standards, it may be appropriate for the despatching or receiving hospital to send specifically trained personnel to accompany the patient.
- This is particularly true in the case of newborns and maternity patients. They are to be afforded every courtesy, and will normally take part in patient care during transit, with the Officer.
- The Officer is responsible for the patient within our care, and should utilise any specialised staff and skills available, in the best interests of the patient.
- Paramedics may only administer non-authorised medications within the guidelines and procedure laid down on the Special Medication Authority and Record form.

If insufficient information is given verbally, and no escorting personnel are with the patient, an Officer may need to open a sealed doctor's letter, in order to obtain the information essential for management of the patient.

Officers must be able to justify this action.
A Medical Practitioner may certify “Life Extinct”. They may also issue a “Cause of Death” certificate where they believe the death had a known cause and the deceased is known to them.

Ambulance Officers may be called to a scene where a death has occurred. Deaths involving trauma or other “unnatural” causes (e.g. electrocution), sudden death of unknown cause and/or unidentifiable deceased must be reported to the police, (e.g. drowning, suicides, shootings, stabbings, traffic accidents, workplace deaths etc).

Ambulance Officers may also certify “Life Extinct” under the provisions of the Coroner. Police will offer Ambulance Officers the opportunity to complete a “Life Extinct” form where after proper examination Ambulance Officers decide that no life exists.

NOTE: Ongoing patient treatment or other urgent calls take precedence over the completion of the forms. Police can revert to other established methods of certifying “Life Extinct”.

**Obvious deaths**

This is the **ONLY** category in which Police Officers may issue a “Life Extinct” form. “Obvious deaths” associated with trauma are reportable to the Coroner.

“Obvious deaths” are those where the state of the body is clearly incompatible with life:

- **Extensive trauma** has caused decapitation, severance of the torso, disruption of a vital organ (e.g. brain), or fragmentation of the body; or

- **Well established decomposition** has caused extensive discolouration of the skin, bloating of the body, and, in some cases, larval infestation and partial exposure of bones; or

- **Advanced decomposition** has exposed most of the skeleton, so called “skeletal remains”.

**Suspicious deaths**

Suspicious deaths may include a criminal act, suicides, stabbings, shootings, overdoses or where the information gathered does not make sense.

Where Officers suspect a suspicious death Police need to be called immediately and the scene secured. Documentation is important and any details you gather should be included. This is evidence and may be required by a court.

Patient care to others should not be delayed. If CPR is stopped please leave the scene as is. Should this happen Officers need to be aware that they will contribute to evidence at the scene and may inadvertently contaminate the scene.
Suicidal deaths

All suicidal deaths should be treated as suspicious. Notes left at the scene are confidential and evidence. The knot used to form a noose must be left tied and the rope cut away from the knot where possible. Do not cut down the deceased if there is an obvious death and CPR is not considered. Protect the scene and call Police.

Non suspicious deaths

Non suspicious circumstances may include deaths at home of natural causes. Officers will need to establish a need to contact Coronial / Police.

If there are no suspicious circumstances, the deceased’s Medical Practitioner may be phoned and once given the circumstances surrounding the death asked if there would be a “Cause of Death” Certificate forthcoming. If so there is no need to contact Police. The relatives may then be advised to contact a funeral service of their choice and make all further arrangements with them (i.e. the picking up of the body etc). This needs to be documented (time of call and name of Practitioner).

Should Medical Practitioner be unavailable then Police should be called and advised of the situation. Usually the Officers will be called back once the police have tried to contact the Medical Practitioner. If no contact is made and/or the “Cause of Death” Certificate is not forthcoming then Police must attend.

Should police attend they will usually convey the deceased via a government contracted funeral service. If for an unknown reason a contractor is not available or due to the death being in a public place, Ambulance Officers may then be required to take the deceased to the requested mortuary.

Maintaining Awareness and Peer Support (MAPS)

Officers who attend these deaths may be subjected to unforeseen stress and may need to contact a MAPS member. Occasional the scene is protracted and involved. Many people especially relatives may require a counsellor. The St John Ambulance Chaplain may be called for further advice.
Specific information needed:

**History** of the event:
- Onset.
- Duration.
- Any seizure activity.

**Past** history:
- Medications.
- Diseases.
- Other faints.

**Associated symptoms:**
- Vertigo, nausea, chest or abdominal pain (faint may be precipitated by a sudden internal bleed).

**Specific physical findings:**
- Vital Signs and oxygen saturation.
- Level of consciousness.
- Neurological status.
- Signs of head trauma.
- Blood sugar level.

**Management:**

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Position of comfort. Do not sit patient up until well recovered — may faint again!
- Raise legs if necessary.
- If Vital Signs unstable or patient older:
  - **Oxygen**, high concentration or 100%
  - Consider Glucagon/Glucose Oral Gel if indicated.
  - Monitor cardiac rhythm.
  - Monitor Vital Signs and oxygen saturation during transport.
Specific precautions / notes:

- Most fainting is vasovagal, not cardiac. Lying down should be sufficient.
- Fainting whilst lying down is almost always cardiac.
- Fainting by definition is temporary. If patient still unconscious, treat as such.
- Any patient over 40 with first faint — always transport.
- **Serious causes of apparent faints may include:**
  - Cardiac arrhythmias — **MAY BE TRANSIENT.**
  - Sudden severe blood loss — external or **internal.**
  - Postural hypotension (sometimes due to medication).
  - Hypoglycaemia, Diabetic or due to low food intake.
  - Cerebro-vascular Accidents (C.V.A) or Transient Ischaemic Attacks (T.I.A.)
    T.I.A. resembles a C.V.A. (Stroke), but is of short duration, even if
    recovered, always transport to medical care for assessment.

With a simple faint, on assuming the recumbent position, there is a rapid return to normality, that is:

- Full consciousness is restored.
- The pulse becomes normal.
- The BP returns to normal.

If any of these Vital Signs are abnormal immediately after the faint episode, this is not a simple faint, and the patient should be transported to hospital.
Specific information needed:

- **Present history:**
  - When last well.
  - Onset and progression of present state.
  - Previous symptoms such as headaches, seizures, confusion, etc., trauma clues.
- **Past history:** previous medical or psychiatric problems.
- **Medications:** use and / or abuse.
- **Surroundings:**
  - Check for pill bottles, syringes, etc., and bring with patient.
  - Note — Odour in house (alcohol, cannabis, ketones).
  - Medic alert?
  - Evidence of diabetes? (possible hypoglycaemia)
  - Drug abuse?

Specific physical findings:

- Vital Signs and oxygen saturation.
- Level of consciousness and neurological status.
- Signs of trauma e.g. head, body.
- Odour of breath (ketone smell of diabetes, alcohol, etc); needle tracks (possible IV narcotic overdose).
- Check blood sugar level and Medic Alert tag.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Airway:** protect as needed, e.g. oropharyngeal airway if indicated.
- **Consider advanced airway (if trained and authorised) only if unable to maintain optimal oxygenation and a tube would improve this.**
- **Oxygen,** high concentration or 100% ventilate if necessary.
- **If IV present,** keep vein open, or as directed.
- **Consider Glucagon/Glucose Oral Gel** if indicated.
- **Transport in lateral position.** If neck trauma suspected consider cervical collar. Logroll as necessary.
- **Monitor Vital Signs and oxygen saturation during transport, and record.**
- **Monitor cardiac rhythm, and record.**
Specific precautions / notes:

- Be particularly attentive to airway.
- Difficulties with secretions, regurgitation or vomiting, and inadequate tidal volume are common.
- **Noisy** breathing is **obstructed** breathing.
- **Hypoglycaemia** may present as a focal neurological deficit or coma (stroke-like picture) in elderly persons.
- If head injury present, assume spinal injury, support cervical spine with cervical collar and sandbags. Protect from external injury while unconscious — skin, eyes, limbs and nerves.
Specific information needed:

- **Seizure history:**
  - Onset.
  - Time interval.
  - Previous seizures.
  - Type of seizure.

- **Medical history:**
  - Especially head trauma.
  - Diabetes, headaches.
  - Drugs.
  - Alcohol.
  - Medications.
  - Pregnancy.

- Possibility of cerebral hypoxia (fits in older people are usually hypoxic).

Specific physical findings:

- Vital Signs and oxygen saturation.
- Generalised seizure activity – continuous or repeated.
- Level of consciousness.
- Blood sugar level.
- Head and mouth trauma.
- Incontinence.

Management:

- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Ensure patency of airway (NOTE: Do not force anything between the teeth).
- Oxygen, high concentration or 100% (**ventilate if necessary**).
- Identify and treat known cause when practical e.g. known diabetes.
- Give Glucagon/Glucose Oral Gel if hypoglycaemic.
- Consider IM Midazolam for continuing fits, if trained and authorised.
- Suction as needed.
- Lateral position for transport, if unconscious — maintain safe airway.
- Monitor cardiac rhythm as necessary (difficult if still fitting).
- Monitor Vital Signs and oxygen saturation.
- Protect from injury.
Administer Oxygen as effectively as possible.
Transport.
Advise hospital (Form CPG General 1.9 DeMIST) if urgent.

Specific precautions / notes:
- Move hazardous material away from patient. Restrain the patient only if needed to prevent injury. Protect the patient’s head.
- Attempts to force an airway into the patient's mouth can completely obstruct the airway, and should not be tried.
- Trauma to tongue is unlikely to cause serious problems, but trauma to teeth may, if inhaled.
- Be aware of post-fit confusion.
- Fully assess patient once the fit has ceased, to identify and treat underlying conditions.
- Always transport.

PAEDIATRIC

Febrile Convulsions:
Brief events usually lasting less than five minutes, in a febrile child more than six months and less than five years old.

Specific information needed:
- **Seizure history:**
  - Onset.
  - Time interval.
  - Previous seizures.
  - Types of seizure.
- **Medical history:**
  - Fever.
  - Viral illness.
  - Meningitis.
  - Septicaemia.
  - Urinary tract infection.
  - Pneumonia.
  - Ear infection, etc.
Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Ensure patency of airway. Protect from injury.
- **Oxygen**, high concentration or 100% — administer Oxygen as effectively as possible.
- NOTE: Do not **FORCE** anything between the teeth.
- NOTE: Do not try to cool child by tepid sponging, cold water etc. Shivering will further increase temperature.
- Transport lateral position, if unconscious — maintain safe airway.
- Paracetamol may be given by parents, according to manufacturer’s instructions.

Fever:

- Children have less developed temperature control mechanisms, are more prone to febrile conditions and have less developed brains. Fits in association with temperatures are therefore common, in particular the six month to five year age group.
- Fever itself is part of the body’s normal immunological response to infection. It is beneficial because it aids white cell function and impedes infecting organism.
- Fever itself is not harmful.

Signs:

- Raised body temperature. The convulsion may be the first sign of a febrile illness.
- Usually due to viral infections but also UTI's, pneumonia and other bacterial infections.
- Less commonly due to other diseases (non-infective).

Management:

- Do we need to treat it? Generally no.
- However it is often associated with pain/misery and is worth treating with antipyretics. Paracetamol or Ibuprofen if miserable or in pain.
- Strip off excessive clothing.
- Parents are typically extremely distressed and most think their child is dying. Explanation and reassurance is vital.
Specific information needed:

- When did it happen? Less than 3 hours requires urgent transport.
- Sudden or slow?
- How did it affect the patient?
- Bystander information.

Specific physical findings:

- Assess conscious state.
- Blood sugar level.
- Neurological assessment (Skill 103):
  - Impairment of speech.
  - Understanding.
  - Function — which side and area.
  - Sensation — which side and area.

Management:

- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Position patient on their side if the level of consciousness is depressed. If conscious, raise upper body 30° to decrease cerebral oedema.
- Oxygen, high concentration or 100%.
- Glucagon/Glucose Oral Gel if indicated.
- Monitor:
  - Vital Signs and oxygen saturation.
  - Level of consciousness.
  - Changes in neurological status.
- If BP is very high, do not try to reduce the blood pressure.

Specific precautions / notes:

- Be supportive emotionally.
- Remember a stroke patient may have full mental and hearing faculties. Treat patient at all times as though they are fully aware. Speak to patient. Do not discuss over patient.
- Beware the deteriorating stroke patient.
- Noisy breathing is obstructed breathing — watch the airway.
Specific information needed:

Present behaviour causing concern:

- **History**:
  - Of recent crisis, emotional trauma, bizarre or abrupt changes in behaviour, suicidal ideas, alcohol / drug intoxication, toxic exposure.
- **Past history**:
  - Previous psychiatric disorders, medical problems or medications.

Specific physical findings:

- **Vital Signs**, note pupil size, symmetry, reactivity.
- **Mental status** – refer to mental health triage scale.
- **Identifiable odour on breath?**
- **Medic Alert tag**.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure**.
- Restrain **ONLY IF ESSENTIAL** to protect yourself and the patient using the minimum force necessary. Restraint may be verbal, physical and / or chemical (Midazolam, Haloperidol) depending on the individual circumstances.
- Call for relevant assistance through Communications Centre, if needed.
- Attempt to establish rapport.
- If lethargic or Vital Signs unstable, administer Oxygen, high concentration of 100%, and monitor Vital Signs carefully.
- Give Glucagon/Glucose Oral gel if indicated.
- If suicidal: Do not leave patient alone. Remove or have someone remove dangerous objects (e.g. knives, guns, pills).
- If appropriate, inquire specifically regarding depression, helpless or hopeless feelings and thoughts of suicide.
- If appropriate, quietly question specifically about hallucinations or delusions and decide if patient is likely to act them out.
- Transport in calm, quiet manner, monitor Vital Signs if you can without disturbing the patient.
Specific precautions / notes:
- Psychiatric patients may have an organic basis for mental disorders.
- Beware of head injury, hypoxia, hypoglycaemia, and overdose.
- If emergency treatment is unnecessary, do AS LITTLE AS POSSIBLE except to reassure while transporting. Be very aware of the patient’s “personal space”.
- If the situation appears threatening, a show of force involving police may be necessary before an attempt to restrain the patient is made. Consider your own safety and limitations. Use enough back-up to be confident and forthright.
- Where Officers are confronted with the need to protect themselves or other persons (7.4.2. Under section 243 of the Criminal Code — prevention of offences for which an offender may be arrested without a warrant; Prevention of violence by persons mentally impaired) it is lawful for any person to use such force as is necessary in order to prevent a mentally impaired person from doing violence to any person or property.

When triaging, consider:
- Manifest behaviour disturbance.
- Presence of / or deliberate self harm.
- Perceived or objective level of suicide ideation.
- Patient's current level of distress.
- Perceived level of danger to self / others.
- Need for physical restraint, police.
- Disturbance of perception.
- Manifest evidence of psychosis.
- Level of situational crisis.
- Descriptions of behaviour disturbance in the community.
- Current level of community support.
- Presence of carer / supportive adult.

A Mental Health Triage Scale:

**Category 1**
Patients with a life-threatening injury or illness — as normal urgency.

**Category 2**
Emergency
Patient is violent, aggressive, suicidal, danger to self and / or others, has / may have police escort.
Category 3  Urgent
Patient is very distressed or psychotic, likely to become aggressive and is a danger to self and / or others, patient is experiencing a situational crisis and is very distressed.

Category 4  Semi-urgent
Patient has a long-standing, semi-urgent mental disorder / problem. May have a supporting agent present (e.g. community mental health nurse).

Category 5  Non-urgent
Patient has a long-standing non-acute mental disorder / problem. No supportive agency present.

Can be divided into twelve types, for convenience of description:

- The depressed patient.
- The anxious patient.
- The patient who is thought disordered.
- The phobic patient.
- The paranoid patient.
- The disorientated patient.
- The suicidal patient.
- The trauma patient.
- The intoxicated / withdrawing patient.
- The lonely patient.
- The violent patient.
- The homeless / itinerant patient.

Most common psychiatric emergencies are:

- Acute psychotic state.
- Acutely depressed and / or suicidal.
- Chemical intoxication.
- Acute situational crisis.
MENTAL HEALTH DEFINITIONS

Emergency: a sudden unforeseen event needing prompt action.

Psychiatric Emergency: urgent situation that can occur repeatedly, requiring immediate action without necessarily bringing about a change in the person's life. It can include acute disturbances in thought, behaviour, mood, or social relationships.

Crisis: a turning point that prevents life going on as usual.

Safety:
- Is the patient a danger to themselves and/or others?
  Most common reasons — acute psychotic state, and depression/suicide.
- Is the environment safe?
- Be aware of potential weapons. For this reason, avoid assessing the patient in a kitchen or workshop if possible. Avoid allowing the aggressive patient to impede your path to the nearest exit.
- Be aware also of the presence of other persons in the assessment environment and gauge whether they may pose a direct risk or potentially further escalate an already volatile situation.

Aggressive behaviour — some causes:
- History of assaultive/aggressive behaviour verbally and/or physically.
- Acting out against authority.
- Chemically intoxicated.
- Confused/disorientated.
- Responding to a perceived injustice from a previous incident.
- Being transported against their will.
- Anxious/stressed, very fearful.
- Acutely psychotic, acting upon command auditory hallucinations.
- Suspected head injury or acute medical problem.
- Suffering severe physical pain.
Transporting Patients under the Mental Health Act of 1996:

- **Voluntary patients** are to be transported as per normal medical calls.

- **Involuntary Patients** who have been assessed by authorised medical staff need to be accompanied by the correct forms. ‘Authorised’ medical staff may be any doctor or other clinician designated as an Authorised Mental Health Practitioner.

**Form 1 : Referral for Examination by a Psychiatrist:**

- The patient is involuntary at this point. The Form 1 may need to be accompanied by a Form 3 (Transport Order) to enable police assistance if required.

**Form 3 : Transport Order:**

- Filled in by a medical practitioner or Authorised Mental Health Practitioner in order to legally authorise the police to assist in the safe conveyance of the patient to the designated hospital.

**Form 5 : Order for receipt into and detention in hospital and for further assessment:**

- When a patient has been examined by a psychiatrist, otherwise than in an authorised hospital and an order is made for the person to be received and detained at an authorised hospital.
  
  e.g. A patient is examined initially at a country regional hospital and a decision is made to have the patient transferred to an authorised hospital in Perth.

**Form 7 : Transfer of patient between hospitals:**

- If an involuntary patient is being transferred from one authorised hospital to another authorised receiving hospital.
  
  e.g. the patient is to be transferred from the Alma Street Centre in Fremantle to Graylands Hospital you will need to produce this form upon arrival at Graylands.

In difficult circumstances Officers are often confronted with involuntary patients and may require ‘back up’ for restraint and / or assistance with conveyance. Police under **Section 195 the Mental Health Act** also have powers of apprehension. For the purpose of complying with the Act, Officers support Police by providing the medical rationale for the transfer to a medical facility for assessment.
Where abnormal behaviour is suspected to be of organic origin, patients should be taken to a Hospital Emergency Department rather than a Mental Health facility, unless prior arrangements have been made.

Section 195 (Mental Health Act 1996):
“195 (1) A police Officer may apprehend a person if the Officer suspects on reasonable grounds that the person —
   (a) Has a mental illness; and
   (b) Needs to be apprehended to –
       Protect the health or safety of the person or any other person; or
       prevent serious damage to property.”

Note: It is at this stage that the ambulance service may be called upon to transport the patient by the Police who do not need any forms completed by virtue of this section of the Act.

Emergency treatment can be given anywhere by nurses, for example, in remote locations, and may be authorised by a medical practitioner who has not examined the patient.

Authorised Mental Health Practitioners (can be any qualified mental health practitioner, e.g.. Mental Health Nurses) can issue some of the forms. However where for example a community mental health nurse is on the scene and has referred the patient on a Form 1, usually police will accompany the patient (by virtue of the nurse filling a Form 3) in case of restraint being needed.

Community Treatment Orders are used by a mental health facility so that the patient may be treated in the community as an outpatient.

A Form 11 is a Revocation of a Community Treatment Order and acts as the referral. This now compels a Patient to attend a designated facility. If the Community Treatment Order is revoked at some distance from the patient’s location, then the document must be faxed to the referring location. In most cases the Form 11, will also be accompanied by a Form 3, Transport Order, requesting Police to assist with the conveyance of the patient.
Specific information needed:
- **History**: acute insult or injury; slow or rapid deterioration.
- **Relevant past history**: chronic lung or heart problems (diagnosis?); relevant medications; home Oxygen, past allergic reactions; recent surgery.
- **Associated symptoms**: chest pain?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Level of consciousness.
- Cyanosis.

**Paediatric**: Pallor, cyanosis, exhaustion may be a late sign.
- Evidence of upper airway obstruction; hoarseness, drooling, coughing, inspiratory stridor, or altered behaviour as a result of hypoxia.
- Beware of upper airway obstruction mimicking bronchospasm – obtain an adequate history.
- Breath sounds; clear, wet, wheezing, laboured. Abnormality on inspiration or expiration?
- **Beware silent chest**.
- Signs of congestive failure; distended neck veins when upright, wet lung sounds, peripheral oedema (ankles and base of back, over sacrum "pits" when pressure applied).
- Airway oedema, ‘hives / allergic rash’.
- Evidence of trauma.

**Newborn/Neonate**
- If heart rate < 100 / min or inadequate breathing, give positive pressure ventilation until heart rate is > 100 / min and infant breathing.
- Inadequate breathing and heart rate < 60 / min.
- Assess adequacy of ventilation and improve if possible. If heart rate does not increase to > 60 / min give chest compressions with positive pressure ventilation at 3:1.
General Management:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100% (ventilate if necessary).
- Put patient in position of comfort.
- Identify and manage upper airway obstruction, if present.

Causes of Dyspnoea:
- Complete upper airway obstruction.
- Partial upper airway obstruction.
- Lower airway obstruction — reactive airways e.g. asthma.
- Lower pulmonary problems.
- Cardiac causes of dyspnoea.
- Hyperventilation.

Upper Airway Obstruction
Complete
Specific Management:
- Obstructed airway management (Skill 309).
- Laryngoscope and Magill Forceps (Skill 310) if authorised.
- Head and chest steeply down — let gravity help.
- Up to 5 back blows / chest thrusts may be tried (Skill 309).
- Consider Cricothyrotomy (Skill 311) if authorised.

Partial
Specific Management:
- Croup, epiglottitis, anaphylaxis, foreign body (never put anything in the mouth in croup, epiglottitis, anaphylaxis — may cause complete spasm of larynx).
- Oxygen, high flow or 100% as needed for patient comfort. Prepare to ventilate if respiratory failure develops.
- Consider anaphylaxis. Transport sitting upright or in position of comfort.
- Initially try:
  - Removal of foreign body, Laryngoscope and Magill Forceps (Skill 310) if authorised.
  - Oxygen, high concentration or 100%, Ventilate if necessary 100%.
  - Monitor oxygen saturation and patient status.
- NEVER stop Oxygen if deterioration in consciousness or breathing (usually due to exhaustion, fatigue, especially of diaphragm).
- **Oxygen** almost never depresses breathing in the field, and can be ignored as a cause (**exhaustion** can depress breathing, consciousness, even if given Oxygen).
- If unconscious or condition deteriorates, high oxygen or 100% and ventilate gently.

**PAEDIATRIC**

**Croup:**
- Most common in children 6 months to 4 years of age.
- Gradual onset often associated with preceding cold or other viral infection.
- Often worsening at night.
- Inspiration stridor, barking cough, nasal flaring, retractive breathing, restlessness, tachycardia, cyanosis.
- Nebulised adrenaline should be considered in severe croup with retractive respirations.

**Caution:** Beware rebound of the condition. All patients administered nebulised adrenaline must be transported to definitive care as the patient may improve but then subsequently deteriorate rapidly.

**Epiglottitis:**
- Most common in children over 3 years of age but can exist in adult population.
- Rapid onset, pain upon swallowing evolving to inability to swallow with associated drooling (this is a serious sign). May be postured with neck extended into the sniffing position, lower jaw protrusion, inability to speak, soft stridor, high fever or soft expiratory snore.

**General Principles:**
- Do not make the child more upset or anxious as this will further compromise the airway.
- Administer Oxygen carefully to avoid upsetting the child.

**Caution:** do not inspect the airway of the conscious child with suspected croup or epiglottitis as this may lead to sudden obstruction in cases of epiglottitis. Do not alter the child’s preferred position.
Other pulmonary problems:

- **Chest wall:**
  - Rib fractures.
  - Flail chest.
  - Be prepared to ventilate if breathing ineffective.

- **Pleural cavity:**
  - Pneumothorax (air into chest collapses / compresses the lung).
  - Haemothorax (bleeding into chest collapses / compresses the lung).

- **Lung Tissue:**
  - Pneumonia.
  - Pulmonary embolism.
  - Non-cardiogenic Pulmonary Oedema (e.g. near-drowning, toxic gases, etc.).

**Cardiac Causes of Dyspnoea:**

- Acute cardiogenic Pulmonary Oedema.
- Sudden tachy arrhythmias — check pulse rate, monitor.
- Chronic Congestive Cardiac Failure.

**Hyperventilation:**

- Breathing into a bag may be effective for managing hyperventilation, but it can cause significant hypoxia.
- It does **NOT** work, as thought in the past, by allowing the carbon dioxide level to rise and reduce the breathing stimulus. Hypoxia would kill long before this happened! If the bag fits tightly, they will become hypoxic. The effect is psychological.
- Use of a bag may none-the-less be helpful as a technique for getting the patient to concentrate on the breathing pattern. Ensure the bag **IS NOT** tight fitting.
- "Talk down" the respiratory rate with / without use of Oxygen as a tool to help.
- Do not over-diagnose “hyperventilation” in the field. Your patient could have a pulmonary embolus or other serious problem. Hyperventilation with chest pain is an AMI until proved otherwise. Give them the benefit of the doubt. Treatment with Oxygen will not harm the hyperventilator, and it will protect you from under estimating the problem.
- **Hyperventilation is usually associated with severe emotional stress.**
Specific precautions / notes:

- If you are unable to differentiate the cause of the respiratory distress, the proper course is to administer Oxygen, and transport in a position of comfort.

- **Wheezeing in older persons** may be due to **Pulmonary Oedema**, not asthma. Your patient may make the wrong diagnosis. Consider also pulmonary embolus.

- Children with croup, epiglottis or laryngeal oedema who develop respiratory arrest, usually do so due to exhaustion or spasm. You will still be able to **ventilate gently** with mouth-to-mouth or using resuscitation equipment, e.g. mouth-to-mask.

- Children achieve higher Oxygen concentrations because of lower inspiratory rate, tidal volume, and dead space. Even a therapy mask can give 60 — 70% Oxygen in a child.

- Sudden complete obstruction due to epiglottitis may respond to tipping the child steeply head down, and using back-blows to dislodge the swollen epiglottis.
Asthma is a condition of increased airway responsiveness and increased airway secretions. This results in diffuse, reversible airway obstruction or narrowing and airway inflammation. Increased mucus production may cause bronchial ‘plugging’, especially in children. Alveolar hypoventilation ensues leading to ventilation perfusion mismatch, CO₂ retention and air “trapping”.

Types of Asthma:

Extrinsic:
- Classic allergic asthma.
- Common in children, young adults.
- Seasonal in nature.
- Sudden brief attacks.
- Major component is bronchospasm.
- Good bronchodilator response.

Intrinsic:
- More common in older adults.
- No immunologic cause.
- Aspirin sensitivity / nasal polyps.
- May have poor bronchodilator response.

Specific information needed:

History:
- Associated “triggers”.
- Duration of symptoms.
- Medications including bronchodilators and steroids.
- Past episodes.
- Asthma plan.
- Usual peak flow.
Specific physical findings:

- Expiratory wheezing.
- Tachypnoea.
- Accessory muscle use.
- Retractions.
- Tachycardia.
- Hyper-inflated chest.
- Pulsus paradoxus in severe attacks.
- Anxiety, restlessness (hypoxia) progressing to drowsiness, confusion (hypercarbia).

Note:

- Absence of wheezing or breath sounds may indicate **IMPENDING RESPIRATORY ARREST**.
- Lethargy, confusion, suprasternal retractions is an indication of **RESPIRATORY FAILURE / INSUFFICIENCY**.
- Beware the "**SILENT CHEST**" in an Asthmatic patient – it is a late and serious sign.
- The use of a spacer is equally as effective as nebulisation, whether mild, moderate or severe.
- Use of a nebuliser if patient cannot adequately inhale.
- Salbutamol 8 to 12 puffs via an MDI (100 mcg / dose) is equivalent to 5mg via nebuliser.

Specific Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Oxygen high concentration or 100% or 8-10 litres per minute with high concentration mask. Sitting position or position of comfort and encourage coughing.
- Administer Salbutamol via a space chamber (Skill 613) or nebuliser (Skill 602) if trained and authorised, even if patients have used their own aerosol or nebuliser.
- Pre and post treatment Peak Flow (Skill 109) measurements when practical, and record.
- If patient deteriorating, impaired consciousness, respiratory shock, consider intramuscular Adrenaline if trained and authorised.
- Monitor cardiac rhythm.
- **NOTE**: The EpiPen and EpiPen Jnr. MUST NOT be used for treatment of asthma.
- Consider intubation if trained and authorised.
Extreme care should be taken when ventilating an asthmatic patient. Gently ventilate if necessary at a rate of no more than 4-6 breaths per minute. This allows for adequate exhalation and avoids air trapping which may otherwise lead to obstructed venous return, reduced cardiac output and may lead to PEA arrest.

Consider fluid infusion as asthmatics do have the potential to develop shock via respiratory fluid loss and hypoxia / acidosis induced circulatory collapse.

Monitor patient carefully. Record, Time given, Route, Effects, Name of medication and Dose (TREND).

Monitor Vital Signs and oxygen saturation (increase Oxygen flow rate to achieve >90%). A Good SpO2 level alone does not mean the patient is not time critical as CO2 retention is still a major problem.

Do not delay transport to await results of medication.

If necessary, advise hospital (CPG General 1.9 DeMIST Procedure).

Paediatric Patient Presentation

- Cough.
- SOB, rapid respiration.
- Recession; sternal, intercostal, subcostal, suprasternal-tracheal tug.
- Nasal flaring.
- Accessory muscle use.
- Wheeze (Not always).
- Difficulty speaking.
- Pallor, cyanosis and exhaustion (Late and preterminal signs).

Note: Children under 12 months and even older may not respond to asthma medications due to their stage of lung development.

Risk assessment for immediate transport

The presence of any one of the following suggests the need for immediate transport and consideration of time criticality:

- Prior ICU admissions.
- Prior intubation.
- >3 ED visits in past year.
- >2 hospital admissions in past year.
- >1 bronchodilator canister used in past month.
- Use of bronchodilators > every 4 hours.
- Chronic use of steroids.
- Progressive symptoms in spite of aggressive treatment.
- Patient unable to speak in sentences.
A small number of patients with CAL that have chronic carbon dioxide retention used to be thought to be "Oxygen sensitive". It has been said that if they are given high Oxygen concentrations, such patients may stop breathing and become unconscious. This is very rare in ambulance practice. The most likely cause for hypoventilation in these patients is exhaustion — on provision of supplementary Oxygen they don’t have to work to get Oxygen so they may stop trying!

These patients may have any or all of, chronic bronchitis, emphysema and asthma.

They are usually in the middle to old age group with a long history of chronic bronchitis and emphysema, and numerous admissions to hospital.

They have markedly reduced exercise tolerance and can only walk a few metres on the flat.

They are sitting up, gasping for breath, barrel-chested with expiratory wheezing and rhonchi.

Hospital authorities have occasionally told them in the past, that they must only have Oxygen via a low concentration mask or that Oxygen may be dangerous for them!

**Specific Information Needed:**
- Initial condition and Vital Signs.
- Management given.
- Changes in condition and Vital Signs and oxygen saturation.

**Management:**
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Sit up.
- Salbutamol via space chamber or nebulised by 8L/minute Oxygen.
- Monitor oxygen saturation.
- Watch for respiratory depression, i.e., falling respiratory rate and tidal volume together with a decreasing level of consciousness. **If this happens**, ventilate the patient with 100% Oxygen until arrival in hospital. However, this is extremely unlikely.
Under **NO CIRCUMSTANCES** should you withdraw Oxygen in these patients in the pre-hospital situation. Only a Doctor, present and taking over care of the patient and remaining with them to hospital, may over-ride this instruction.

The patient always has the **right to refuse** treatment, if capable of rational and reasoned decision. However, **hypoxia** may affect their reasoning and judgement.

On some occasions, Hospital staff taking over patient responsibility may discontinue Oxygen on arrival — sometimes so that blood gas estimations may be done. This is part of **hospital** management and has no bearing on the need for Oxygen during **ambulance** management.
On occasion officers may find themselves in a situation whereby they have difficulty ventilating a patient. A failure to ventilate situation can occur at any stage of patient management. When faced with the failure to ventilate situation, officers should perform a **D.O.P.E.S** check.

**D - Displacement**
- Re-evaluate for breath sounds over the epigastrium.
- If gurgling is heard withdraw ETT immediately (Skill 307), suction if required (Skill 302/303).
- Consider tube depth, right main bronchus or oesophageal intubation.
- Check ETT/LMA placement after every movement of patient.

**O - Obstruction**
- Resistance to ventilation is a strong indicator of obstruction. This includes both upper airway obstruction (as with laryngeal obstruction, see Skill 311) or lower airway obstruction (as with Asthma).
- If obstruction present, pre ventilate with 100% O\(^2\) and suction to remove obstruction.

**P - Pneumothorax**
- Consider the signs and symptoms of a pneumothorax or pneumohaemothorax (CPG 5.9 Chest Injuries).
- Consider ventilator settings.

**E - Equipment failure**
- Consider failure in equipment from the ETT tube to the oxygen cylinder and back.

**S - Secretions**
- Thick secretions can form an obstruction of the ETT tube. Soft suction of the ETT tube may be required (Skill 307).
- Secretions may need to be diluted with 5 -10 mls of NaCi before suctioning of ETT tube.

**Management:**
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Systematically exclude possible causes using D.O.P.E.S. check:
- Supply high concentration oxygen once ventilatory solution is found.
- **Note:** Document ventilatory failure and D.O.P.E.S. solution on PCRF.
Specific information needed:

- History of event.
- Mechanism, nature and time of incident.
- Specific physical findings.
- Patency and state of airway.
- Neurological status.
- Other signs, need for advanced airway management?

Indications:

Patients who may benefit from intubation:

- Severely injured patients, especially head trauma who are areflexic and have no gag reflex.
- Cardiac arrest patients needing transport during resuscitation.
- If intubation will improve ventilation.
- Other deeply unconscious, areflexic patients in whom ventilation is difficult or cannot be effectively maintained.

Note:

- Do not attempt advanced airway interventions until the patient has been adequately oxygenated by other means.
- Oxygenate for a minimum of one minute before each attempt.
- Consider the LMA as a first option
- LMA preferred for a suspected cervical spine injury.
- Advanced Airway Management is NOT an early priority. Manual ventilation is sufficient.
- Where CPR has been initiated, chest compressions must not be stopped or delayed to attempt advanced airway management. ETT and LMA insertion can and should be done during chest compressions.
- Maximum of 2 attempts for each device.

Endotracheal Tube Intubation

Advantages:

- Provides a secure airway.
- Obtains the best seal.
Disadvantages:
- Needs regular practice.
- Takes longer to intubate.
- On occasions it is very difficult to visualise vocal cords (try LMA).
- May cause laryngeal spasm. Gently oxygenate 100% with BVM until the vocal cords relax. Trying to force oxygen past vocal cords in spasm will only inflate the stomach.
- Laryngoscope blade can cause damage to teeth and lips.
- May cause damage to throat, vocal cords.
- Tube may not seal or can be misplaced or dislodged.
- Requires regular tube placement checks.

Contra-indications

ETT:
- Children smaller than small adult.
- Patient with an intact gag reflex.
- Patient who is likely to react with laryngospasm to intubation.
- Not to be attempted unless unequivocal view of vocal cords. The tube must be observed as it passes through the vocal cords.
- During CPR if the vocal cords are not immediately visible, end attempt.

Management ETT:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Oxygen, 100%.
- If CPR in progress, do not stop chest compressions during intubation attempt(s).
- Remove the tube if the patient is making physical attempts to remove it.
- Two Officers are to reconfirm tube placement regularly, using at least two different checks which are mandatory after any patient movement.
- **NOTE:** It is recommended that the receiving Medical Officer confirms tube placement prior to patient transfer i.e. stretcher to bed.

Laryngeal Mask Airway Intubation

Advantages:
- Can be easier and quicker to place.
- Better choice if possibility of suspected cervical spine injury, does not need neck movement.
- Use if cords not well visualised.
- Works very well during resuscitation (risk of regurgitation is overstated).
Disadvantages:
- Not a definitive airway.
- Does not seal well in all situations – may have difficulty ventilating stiff lungs (i.e. asthma).
- May cause laryngeal spasm. Gently oxygenate 100% with BVM until the vocal cords relax. Trying to force oxygen past vocal cords in spasm will only inflate the stomach.
- Laryngeal mask may roll up on insertion. Carefully remove and try again.
- Laryngeal mask may not seal, or become dislodged.

Contra-indications
LMA:
- Patient with an intact gag reflex.
- Airway restriction or airway spasm.
- Severe intra-oral injury.
- Patients with active vomiting.

Management LMA:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, 100%.
- If CPR in progress, do not stop chest compressions during LMA insertion.
- An attempt should not take longer than 10 seconds.
- Remove the tube if the patient is making physical attempts to remove it, or airway is compromised, or vomits after insertion.
- Reconfirm seal regularly.

Specific precautions / notes:
- Patient transfer:
  - Whenever an intubated patient is moved (e.g. from floor to stretcher, stretcher to bed) the tube placement must be rechecked as there is a serious risk of displacing the tube.
  - Before the transfer of the patient is made the self-filling bag with reservoir is to be detached from the LMA or intubation tube.
  - The Officer ventilating must ensure that the head and neck are supported as one unit, avoiding flexion or rotation, and avoiding traction on the tube. Use of a cervical collar is not sufficient to prevent this. The ventilating Paramedic should control the patient move; reattach the LMA or endotracheal tube and re-check tube placement immediately after the move.
Suction down tube

- Only required for long transports (>2 hours).
- Do not attempt for short transports.
- NEVER suction Pulmonary Oedema.

Laryngeal spasm

Laryngeal spasm is an uncommon but serious condition in which the vocal cords seal shut preventing any air movement/ventilation. It is usually precipitated by manipulating the airway or by touching the vocal cords, but may occur at any time.

Management of Laryngeal Spasm:

- Laryngeal spasm is treated by waiting for the spasm to resolve, which typically only occurs when the patient becomes sufficiently hypoxic for the laryngeal muscles to relax.
- Treatment consists of removing everything from the mouth except an oropharyngeal airway and applying GENTLE pressure with 100% oxygen via a bag/valve mask apparatus until ventilation is possible.
- Force should NOT be used to try to push air past the vocal cords as this never works but merely cause local trauma and insufflates the stomach.

ALL INTUBATION ATTEMPTS MUST BE DOCUMENTED.

ALL CHECKS OF ETT POSITION MUST BE DOCUMENTED.
CIRCULATION
4.1 CHEST PAIN — PRESUMED CARDIAC ORIGIN (ACUTE CORONARY SYNDROME)
October 2010

Specific information needed:

- **Pain:**
  - Nature.
  - Onset.
  - Duration.
  - Location.
  - Radiation.
  - Aggravating or alleviating factors.

- **Associated symptoms:**
  - Nausea.
  - Vomiting.
  - Sweating.
  - Respiratory difficulty.

- **History:** SAMPLE
  - Signs and Symptoms.
  - Allergies.
  - Medications.
  - Previous medical/cardiac history.
  - Last meal.
  - Events preceding the event.

Specific physical findings:

- Vital Signs, general appearance and oxygen saturation.
- Neck vein distension.
- Peripheral oedema.
- Wet lungs.
- Obvious moist breath sounds with or without auscultation, coughing (evidence of heart failure).
- Chest wall tenderness (suggests non-cardiac origin for pain).

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Reassure and position.
- Any patient with current myocardial ischemia evident with or without chest pain are not to perform any actions that may increase myocardial oxygen consumption. **As such, these patients are to be moved with minimal exertion and moved on a stretcher where practical.**
- If patient's history suggests a cardiac origin for the chest pain: Monitor cardiac rhythm and oxygen saturation.
  - Administer soluble aspirin (300mg) if not contra-indicated.
- If BP > 90mmHg and pain ongoing:
  - Administer Isordil 5mg or 0.4 Nitroliungual® sublingually if trained and Authorised.
- If pain still a problem after 5 minutes, and BP maintained, administer another Isordil 5mg or 0.4 Nitroliungual® to a maximum of 3 doses in 15 minutes.
- For long transport times, further doses of Isordil 5mg or 0.4 Nitroliungual® may be given every 30 minutes where indicated.
- **Note:** Nitrates are not to be administered to a patient with concurrent or previous use of medications used for erectile dysfunction within 24 hours (eg: Sildenafil®, Vardenafill®).
- Administer anti emetic Ondansetron as required.
- Administer additional analgesia Methoxyflurane of Fentanyl as required.

**Summary:**
- **OXYGEN, REASSURANCE, ASPIRIN, ISORDIL, ANALGESIA, MONITOR.**
  - Administer 300mg soluble aspirin orally, unless contraindicated.
  - If IV in place, run at a rate to keep vein open (20 drops per minute).
  - If patient's condition deteriorates, transport **Priority 1**.
  - Monitor cardiac rhythm and Vital Signs en route.
  - Provide appropriate pain and anti emetic management as required.

**Pain relief:**
If Oxygen, reassurance and **Nitrates** do not relieve pain, consider additional analgesia (Methoxyflurane or Fentanyl).

**Transport:**
Remember to explain the reason for the use of warning devices or this may increase anxiety.

**Specific precautions / notes:**
- Consider both the clinical presentation and ECG during assessment and do not rely on the ECG alone as not all myocardial ischemia manifests with ECG changes (Non STEMI)
- Transport to the **most appropriate facility**.

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Critical points for patient record:

- Observe and record any complications, which may be present:
  - Arrhythmias.
  - Pulmonary Oedema.
  - Cardiogenic shock.
  - Dyspnoea.
  - Nausea and vomiting.
  - Degree of pain (occasionally patients do not have pain though they have the other signs / symptoms of a heart attack).

Note: If an IV is inserted or in place, run crystalloid to keep vein open 20 drops per minute.
Specific information needed:
- Onset.
- Related symptoms.
- Medications.

Specific physical findings:

Vital Signs

Signs of poor perfusion:
- Altered state of consciousness.
- Signs of shock; cool, clammy skin. Prolonged blanch test > 2 seconds.
- Low blood pressure (systolic < 90).
- Rapid pulse rate (> 100) or slow pulse rate (< 60).

Signs of congestive heart failure:
- Neck vein distension.
- Moist rattling sounds in chest.
- Peripheral oedema, especially in chronic failure.

Management:
- **D**anger, **R**esponse, **A**irway, **B**reathing, **C**irculation, **D**isability, **E**xposure.
- **O**xygen, high concentration or 100% (ventilate if necessary).
- Position of comfort.
- Monitor Vital Signs, oxygen saturation, ECG and identify arrhythmia.
- If IV in place run to keep vein open only (20 Drops/minute).

**IS THE PATIENT PERFUSING ADEQUATELY OR ARE THERE SIGNS OF INADEQUATE PERFUSION?** (confusion, angina, low blood pressure, poor peripheral perfusion).

**IS THE ARRHYTHMIA POTENTIALLY DANGEROUS TO THE PATIENT?**
- Document the arrhythmia.
- Treat according to Clinical Practice Guidelines.
- Re-document the response to treatment (or lack thereof).
- Transport non-emergency if patient has stabilised.
- Monitor condition en route, ECG, Vital Signs and oxygen saturation and report.
- Continue monitoring until handover at a hospital.
- If pulses are not palpable despite a rhythm on the monitor and the patient is unconscious, begin CPR.

**General Notes:**
- In the field situation, arrhythmias are classified as bradycardias (< 60 / min) or tachycardias (> 100 / min). Absent pulses with an apparently normal ECG may also occur.
- CPR is necessary for all unconscious, pulseless patients regardless of the rhythm.
- Defibrillation is only indicated for cardiac arrest with VF or Pulseless VT.

**Bradycardias include:**
- Heart block — complete or incomplete.
- Severe sinus bradycardia.

**Non Invasive Pacing (Fist pacing)**
Percussion pacing is an emergency measure that is used to initiate mechanical function to maintain circulation to vital organs where symptomatic Bradycardia results in poor perfusion.

When bradycardia is so profound that it causes clinical cardiac arrest, percussion pacing can be used in preference to CPR since it is capable of producing an adequate cardiac output with minimal trauma to the patient. It is most likely to be successful when ventricular standstill is accompanied by continuing P wave activity. If percussion does not produce effective circulation promptly, regardless of whether or not it stimulates a QRS complexes, start CPR without further delay.

**Tachycardias include:**
- Atrial flutter.
- Atrial fibrillation.
- Ventricular Tachycardia.
- Supraventricular Tachycardia.

**Treatment:**
- Record and document rhythm strip arrhythmias, both prior to and after therapy, so that the diagnosis and effect of treatment can be documented.
- Oxygen therapy – 100% if possible.
- Monitor Vital Signs, ECG, cardiac output and oxygen saturation.
- Consider Valsalva manoeuvre (if narrow complex regular tachycardia) – ref to Skill Manual.
- Transport.
Ventricular Ectopic Beats

VEB’s may indicate myocardial ischaemia and excitability, therefore:
  - If myocardial infarction is suspected and many VEB's are occurring, or
  - In any ill patient who has VEB's which are:
    - Frequent.
    - Multifocal.
  - Give maximum available Oxygen concentration and analgesia if indicated.
  - Observe patient and monitor carefully for sudden onset of arrhythmia.
  - Record observations and rhythm strip.

Note:

VEB's may also be referred to as:
  - Ectopic beats.
  - Ventricular premature beats.
  - PVC (premature ventricular contractions).
  - Extrasystoles.

Bizarre Arrhythmias:

In emergency situations rhythms may change rapidly and appear bizarre. Treatment is guided by the patient’s clinical state.

**ALWAYS TREAT THE PATIENT AND NOT THE ECG.**
  - If the pulse is present and perfusion is good, give Oxygen and observe patient;
    - Or
  - If the pulse is absent, treat as for cardiac arrest.
Specific information needed:

Enquire and record:
- Sudden onset.
- Acute deterioration.
- Symptoms of possible myocardial infarction without pain.
- Precipitating factors.
- Past cardiac and pulmonary history.
- Medications.
- Associated symptoms.

Specific critical findings:
- Vital Signs, cyanosis and oxygen saturation.
- Level of consciousness.
- Evidence of lower airway obstruction — breath noises (Moist or wheezing).

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100% (ventilate if necessary).
- Sitting position, preferably with legs hanging down.
- Monitor Vital Signs and oxygen saturation. May be hypertensive.
- **Isordil** 5mg or **Nitrolingual®** 0.4mg sublingual spray if patient's BP is greater than 160mmHg if trained and authorised.
- Repeat as per Clinical Practice Guidelines if BP > 140mmHg. Cease if BP falls under 140mmHg.
- For long transport times, further doses of **Isordil 5mg** or **Nitrolingual®** 0.4mg may be given every 30 minutes where indicated and criteria met.
- Consider rotating tourniquets if more than 30 minutes from hospital (Skill 802).
- If IV in place keep vein open at 20 drops per minute.
- Transport.

Specific precautions / notes:
- Hypoxia may cause irritability and non compliance..
- **Ensure Oxygen**, even if patient trying to reject it, as rejection may be due to hypoxia.
- Cease **Nitrate administration if BP drops below 140mmHg.**
- Signs of acute **LEFT HEART FAILURE** include:
  - Sudden onset of breathlessness, often during night, wakens patient — may wheeze ("Cardiac Asthma").
  - "Wet" lungs, pink frothy sputum production.
  - **Pallor** — may be sweating profusely.
Note: Chronic congestive cardiac failure produces venous congestion, and results in peripheral oedema and / or swollen veins. It is due to Right Heart Failure. Eventually left heart failure may follow, with shortness of breath. This cannot be treated in the same way as Acute Left Heart failure.

Specific information needed:

Enquire and record:
- Slow progressive history of deterioration.
- Precipitating factors.
- Long past history of heart and lung problems.
- Medications.
- Associated symptoms.

Specific critical findings:
- Vital Signs and oxygen saturation. May be hypotensive.
- Distended neck veins, cyanosis, particularly peripheral.
- Swelling of ankles, lower legs, over sacrum.
- If severe failure, may also be breathless, lack of energy.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Oxygen, high concentration or 100% (ventilate if necessary).
- Remember nasal catheter if appropriate.
- Sitting position, preferably with legs hanging down.
- Monitor Vital Signs and oxygen saturation.
- If still hypotensive and breathless, consider rotating tourniquets if more than 30 minutes from hospital. (Skill 703).
- Transport.

Specific precautions / notes:

Mental confusion may occur — due to hypoxia. Ensure Oxygen, even if patient trying to reject it, as rejection may be due to hypoxia. Do not use Isordil in CCF. May over-stimulate a failing heart.
Any problem that leads to a decrease in the efficiency of the cardiovascular system in a patient may result in shock. Shock has many causes but ultimately it is a problem of tissue perfusion affecting the individual body cells. If allowed to progress, the tissue, organs, organ systems, and ultimately the patient will die.

**Specific information needed:**

**History:**
- Sudden or gradual onset?
- Precipitating cause or event.
- Allergies, medications, bloody vomitus or stools, significant medical diseases, trauma; especially truncal, long bone and pelvis.
- A high index of suspicion should be associated with high impact mechanisms and patterns of injury involving underlying major organs.

**Clinical Presentation:**
- Mental status; apathy, confusion, restlessness, agitation (due to cerebral Hypoperfusion).
- Pulse > 120 bpm or < 40 bpm (may be a late and dangerous sign), and / or BP < 90mmHg systolic.
- Increased respiratory rate.
- Skin; pale, sweaty, cool, mottled. Blanch test — delayed capillary refill > 2 seconds.
- Signs of trauma, particularly evidence of blunt injury to major body region.
- Signs of pump failure (venous blood back up), jugular or venous distension in upright position, wet lung sounds.

Shock can be classified into several types. Specific identification of types of shock allows for more definitive treatment.

**General Specific precautions / notes:**
- Cerebral perfusion i.e. alterations in conscious state is quick and reliable measure of the progression of the syndrome.
- Restlessness, anxiety, combativeness = earliest signs of shock.
- Best indicator of resuscitation effectiveness = level of consciousness.
- Falling or low BP is a late sign of shock especially in children!
- Pallor, tachycardia, slow capillary refill should be considered shock, until proven otherwise.
HYPOVOLAEMIC SHOCK
Inadequate oxygenation due to poor perfusion as a result of reduced circulatory fluid volume, caused by:
- Blood loss.
- Burns.
- Dehydration e.g. from vomiting.
- Diarrhoea.
- Uncontrolled diabetes, and / or inadequate fluid intake.
- Aortic Aneurism.
- Ruptured ectopic pregnancy.
- Third space loss.

Specific information:
- Pulse rises 30 beats/min or systolic BP drops 15mmHg when moving from lying to sitting or standing = sign of low blood volume.

Specific Management Principles (Hypovolaemic Shock)
- Oxygen, high concentration or 100%. Ventilate as required.
- Control severe external bleeding.
- Elevate lower extremities. **DO NOT** delay transport.
- Start large bore IVs en route to hospital if possible; **minimum time on scene, maximum care en route**.
- Infuse normal saline (refer CPG Medications 11.19 Normal Saline) titrated to conscious state and perfusion.

Specific precautions / notes:
- Aggressive fluid resuscitation resulting in blood pressure above 90mmHg may dislodge immature clots (and make the situation worse) when the bleeding point is uncontrolled e.g. stabbing / shooting injuries to the trunk.
- Transport urgently to a major hospital as soon as possible for definitive treatment. **Minimum time on scene, maximum care en route**.
- Major haemorrhage cannot be stabilised in the field.

CARDIOGENIC SHOCK
Failure of the heart to pump a volume of blood sufficient to maintain adequate perfusion of the body tissues.
Cardiogenic shock or pump failure can occur secondary to various cardiac problems including:
- AMI.
- Cardiac arrhythmias (bradycardia and tachyarrhythmias).
- Congestive heart failure.
• Pericardial tamponade.
• Pulmonary embolism.
• Tension pneumothorax.

**Specific physical findings:**

• Arrhythmias.
• Neck vein distension and peripheral oedema (sign of right heart failure or outflow obstruction). Note: may not be present if also hypovolaemic.
• Wet lungs (Left Heart Failure or back up in pulmonary veins).

**Specific Management Principles (Cardiogenic Shock):**

- Oxygen, high concentration or 100%. Ventilate as required.
- Supine, or head and shoulders slightly elevated.
- **Consider other causes of shock which may also be present.**
- Do not elevate lower extremities.
- Monitor Vital Signs, oxygen saturation and level of consciousness during transport.
- Monitor ECG for rhythms that may contribute to cardiogenic shock, e.g. AF or VT.
- Consider tension pneumothorax if shock follows chest trauma (increased intrathoracic pressure interferes with return of blood to the heart).
- If IV running, crystalloid only to keep vein open (20 drops per minute).
- If patient is hypotensive (systolic <90mmHg) and does not have Pulmonary Oedema, administer fluid challenge 250ml of normal saline as bolus. Stop if the patient becomes SOB.
- If the patient improved with the first bolus but remains hypotensive a second bolus of 250ml normal saline may be given with same precautions.
- Advise hospital **CPG General 1.9 DeMIST Procedure.**
- Transport urgently — PRIORITY 1 for cardiogenic shock.

**Specific precautions / notes:**

- Do not suction Pulmonary Oedema fluid away any more than is essential to clear airway — it just keeps forming.

**NEUROGENIC SHOCK**

Inadequate tissue perfusion, due to severe widespread vasodilation caused by a loss of nervous system control. The increased vascular space may be caused by spinal cord trauma, overdose or vasovagal stimulation (faint — usually transient).
Specific Management Principles (Neurogenic Shock):
- Oxygen, high concentration or 100%. Ventilate as required.
- Little is needed for neurogenic shock, as they are usually well perfused.
- Beware of respiratory compromise which often accompanies significant spinal injuries.

Specific precautions / notes:
- Neurogenic Shock is usually self limiting — caused by dilation of the vascular bed. Responds readily to leg elevation.
- Use leg elevation not head down tilt (which would impede diaphragm movement during breathing). 25cm elevation is adequate.

ANAPHYLACTIC SHOCK (refer CPG Anaphylaxis – Acute Allergy 9.1 Anaphylaxis)
Inadequate tissue perfusion, due to the failure of both the heart and the blood vessels, as a result of an extreme allergic reaction.
The allergic response causes a mixed form of shock with hypovolaemic, cardiogenic and neurogenic components.
In severe cases adrenaline reverses bronchospasm, vascular permeability and vasodilation.

SEPTIC SHOCK
Inadequate tissue perfusion due to widespread dilation of blood vessels and capillary leakage as a result of severe infection.
Represents a mix of different types of shock, plus the release of bacterial toxins initiating or potentiating poor states of perfusion.

Specific management principles (Septic and Anaphylactic Shock)
- Oxygen, high concentration or 100%. Ventilate as required.
- Maintain body temperature.
- Hypothermia may occur.
- Replace intravascular fluid if appropriate. Normal saline titrated to titrate to response (e.g.-→ BP 90mmHg and / or improvement in clinical status).
- Adrenaline where indicated for Anaphylaxis (CPG Anaphylaxis – Acute Allergy 9.1 Anaphylaxis).
Cardiac arrest is a time critical condition requiring immediate intervention.

This guideline is based on the recommendations of the Australian Resuscitation Council (ARC) and the New Zealand Resuscitation Council, December 2010.
December 2010

Post Resuscitation Care

Circulation?

Re-evaluate ABCDE

Treat precipitating causes

12 lead ECG

Re-evaluate ABCDE

Post Resuscitation Care

Assess Rhythm

Non-Return of circulation

Consider and Correct

- Hyperkalaemia
- Hypothermia / hypothermia

Prolonged hypotension

Torsades de pointes

Thrombosis (proximal / coronary)

Norepinephrine

Hyponatraemia / metabolic disorders

Drug

e.g. dopamine, adrenaline

Attach Defibrillator / Monitor

For 2 minutes

CPR

Shock

For 2 minutes

CPR

Non-Shockable

Shockable

Minimal interruptions: 2 breaths

30 compressions: 2 breaths

During CPR

Advanced Life Support

For Adults
ADVANCED LIFE SUPPORT (ALS) ALGORITHM- ADULT

The ALS algorithm allows for a systematic approach to managing cardiac arrest. The algorithm is predicted on the premise the BLS measures have been initiated and remain ongoing throughout the resuscitation process.

MANAGEMENT

Initiate BLS and CPR, maintaining good quality CPR throughout: performed on a firm surface, hands on lower half of sternum, 1/3 depth of chest for each compression (>5cm), a rate of 100/minute and allowing for recoil, and no interruptions to compressions for more than 10 seconds.

Apply monitor/defibrillator
- Charge defibrillator
- Assess rhythm
- Obtain history

1) Shockable Rhythms (VF/Pulseless VT)
Defibrillate ASAP- 200J (Biphasic); 360J (Monophasic). (1st SHOCK)
- CPR for 2 mins (5 x 30:2)
- Prepare and insert IV/IO
- Prepare 1mg/1ml (1:1000) Adrenaline

Toward end of 5th cycle of 30:2 charge defibrillator.
- Reassess rhythm at status check -If shockable defibrillate (2nd SHOCK)
- Continue CPR (5 x 30:2)
- Administer 1mg/1ml Adrenaline after 2nd shock
- Flush with 20-30ml saline
- Prepare 300mg/6ml Amiodarone
- Prepare advanced airway

Toward end of 5th cycle of 30:2 charge defibrillator.
- Reassess rhythm at status check -If shockable defibrillate. (3rd SHOCK)
- Continue CPR (5 X 30:2)
- Administer 300mg/6ml Amiodarone after 3rd shock
- Flush 20-30ml saline
- Prepare more Adrenaline 1mg/1ml
- Prepare/insert advanced airway
Toward end of 5th cycle of 30:2 charge defibrillator.
- Reassess rhythm at status check-If shockable defibrillate. (4th SHOCK)
- Continue CPR (5 x 30:2)
- Administer 1mg/1ml Adrenaline after 4th shock
- Flush with 20-30ml saline
- Insert advanced airway if not done already

Continue resuscitation with 1mg/1ml Adrenaline every second cycle.

Transport ASAP.

2) Non-shockable Rhythms- Asystole or Pulseless Electrical Activity (PEA)
Dump charge and commence 2 mins CPR (5 x 30:2).
- Prepare and insert IV
- Prepare 1mg/1ml (1:1000) Adrenaline and administer ASAP
- Flush with 20-30ml saline
- Consider reversible causes

Assess Rhythm at status check.
- If no change, continue CPR (5 x 30:2)
- Prepare more adrenaline and advanced airway

Assess Rhythm at status check.
- If no change, continue CPR (5 x 30:2)
- Administer 1mg/1ml Adrenaline
- Flush with 20-30ml saline
- Insert advanced airway

If patient remains Asystole or PEA.
- Continue CPR for 2 minutes (5 x 30:2)
- Administer 1mg/1ml Adrenaline every 2nd cycle
Consider reversible causes- H's & T's
Transport ASAP

Reversible/ Correctible Causes:
- Hypoxia - ensure adequate oxygenation/ventilation.
- Hypovolaemia - administer a bolus 20ml/kg.
- Hyper/hypokalaemia/metabolic disorders: give 100ml 10% dextrose IV for hypoglycaemia.
- Hypo/hyperthermia- commence passive warming if severely hypothermic (blankets) or commence cooling.
- Tension Pneumothorax- chest decompression if trained and authorised.
- Tamponade- managed at hospital.
- Toxins- Opiate overdose, administer 2mg Naloxone IV.
- Thrombosis (coronary/pulmonary) - managed at hospital.

SPECIAL NOTES
- Interruptions to chest compressions should be minimised and should be for no longer than 10 seconds.
- Rescuers should frequently alternate compressor duties (eg: every 2 minutes) regardless of fatigue. (NB: if only one rescuer has ALS skills, then the other officer will be required to do more compressor duties whilst ALS skills are performed).
- If IV/IO access cannot be obtained continue resuscitation efforts without drugs/fluids.
- If an advanced airway has been secured (ETT or LMA), do asynchronous CPR with continuous compressions and a ventilation rate of 6-10 per minute. Asthmatic arrests should be ventilated only 4-6 times per minute.
- Precordial thump should not be used for an unwitnessed arrest. It may be considered with witnessed VT arrest only.
- Defibrillation should be delivered as soon as possible for VF and pulseless VT. No further checks of pulse are necessary unless signs of life such as breathing and movement are present.
- If VF/Pulseless VT is witnessed by paramedic- only 1 shock delivered then CPR. (NB: this has changed from 3 stacked shocks).
- After defibrillation, CPR should be recommenced irrespective of electrical success and reassessed at the next status check.
- Where adrenaline preparation or IV access is delayed, 1mg in 1ml may be administered up to 1 minute post defibrillation. Where delayed longer than 1 minute, adrenaline should be held over until after the next defibrillation. Amiodarone should then be held over until the next defibrillation cycle.
- If rhythm changes from VF/Pulseless VT to any non-perfusing rhythm, then continue resuscitation as for non-shockable rhythm.
If rhythm changes from non-shockable (Asystole or PEA) to shockable (VF/Pulseless VT), continue as for shockable rhythm. Not precordial thump or stacked shocks for these circumstances.

Waveform capnography should be used to confirm airway placement and monitor adequacy of CPR.

Consider transportation to hospital early for non-asystole as these patients will not meet the clinical decision rule for ceasing resuscitation efforts.

Pregnant woman >20 weeks gestation need a 30° left lateral tilt.

Post Resuscitation Care:
Hypoxic brain injury, myocardial injury or subsequent organ failure are the predominant causes of morbidity and mortality after cardiac arrests.

- Ensure adequate oxygenation and ventilation.
  - Confirm airway placement, especially after moving patient
  - Ventilate at 12 per minute (Hyperventilation can lead to hypocapnia and cerebral ischaemia)
  - Remove advanced airway if patient has an active gag reflex
  - Aim for 94-98% SpO²

- Ensure Adequate perfusion.
  - If hypotensive (SBP <90mmHg) titrate IV fluids to effect, aim for a systolic greater than 100mmHg
  - Consider 12-lead ECG if trained and authorised

- Temperature
  - Keep the patient cool- unless profoundly hypothermic (<30°C) due to the benefits of therapeutic hypothermia after ROSC

- Glucose
  - Maintain normoglycaemia and avoid hypoglycaemia. Hyperglycaemia >10mmol/l is treated in hospital with insulin
**For Infants and Children**

**Advanced Life Support**

1. **Cardiac Arrest**

   - **CPR**
   - **Defibrillation/ Monitor**
   - **Drug**
   - **Oxygen/Airway**
   - **Vascular Access**

2. **Post Resuscitation Care**

   - **Temperature control (cool)**
   - **Revive**
   - **Evaluate**
   - **Resuscitation**
   - **Circulation**
   - **Spontaneous Return of CPR**
   - **Shock**
   - **Assess Rhythm**

3. **Treatment**

   - **Adrenaline**
   - **Non-shockable**
   - **Shockable**

4. **Start CPR**

   - **Minimise interruptions; 2 breaths**

5. **Review Date**: May 2016

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ADVANCED LIFE SUPPORT (ALS) ALGORITHM- INFANTS AND CHILDREN

This algorithm covers those infants from a few hours old, to the age of 14 years. This does not cover the newborn which is dealt with after this algorithm. (NB: this is a change from previous years where neonatal resuscitation was from birth to 28 days old).

Definitions:

Newborn/newly born = infant whose cardiorespiratory physiology is in transition from an intrauterine environment to several hours after birth.

Infant = more than a few hours old to less than one year of age.

Young child = 1-8 years

Older child = 9-14 years

The majority of cardiorespiratory arrests in infants and children are caused by hypoxaemia or hypotension or both. The initial cardiac rhythm is often bradycardia or Asystole. VF as an initial rhythm is approximately 10%.

MANAGEMENT:

BLS resuscitation for infants and children is done at the same ratio of an adult at 30:2; whereas the ALS ratio for infants and children is 15:2. This gives the equivalent of 10 breaths and 75 compressions in a minute. There are 10 x 15:2 in 2 minutes.

Initiate resuscitation if in cardiac arrest or pulse is less than 60bpm in an infant, less than 40bpm for a child. Open the airway and position the patient with padding under shoulders to accommodate occiput. Begin at a ratio of 15 compressions: 2 breaths ensuring depth at 1/3 chest, rate at 100 per minute, and not being off chest for more than 10 seconds.

Infants: compressions can be two-thumb technique with a depth of approximately 4cm.

Young child: with 'heel' of one hand or two-handed technique approximately 5cm depth.

Older child: as per adult two-handed technique >5cm depth.

Apply monitor/defibrillator

- Charge defibrillator
- Assess rhythm
- Gain history

1) Shockable rhythms (VF/Pulseless VT)

As per adult guideline except:

- Defibrillate 4J/kg.
- CPR for 2 mins (10 x 15:2)
- IO/IV access
- Prepare Adrenaline (10mcg/kg-maximum dose 1mg) after 2nd shock
- Amiodarone (5mg/kg) after 3rd defibrillation
2) Non-shockable- Asystole or PEA.

As per adult guideline except:
- CPR for 2 mins (10 x 15:2)
- IO/IV access
- Prepare and administer Adrenaline (10mcg/kg-maximum dose 1mg) ASAP
- Adrenaline 10mcg/kg every 2nd cycle
- Consider reversible causes

Post Resuscitation Care for Infants and Children:
Recovery in infants and children is typically slower than adults as cardiorespiratory arrest is usually secondary to prolonged hypoxaemia. The focus of post resuscitation care is on ensuring adequate cerebral perfusion, oxygenation and supportive treatment to allow the recovery of vital organs.
- Ensure adequate oxygenation and ventilation
- Confirm airway placement, especially after moving patient
- Ventilate at normal rate for age (Hyperventilation can lead to hypocapnia and cerebral ischaemia)
- Remove advanced airway if patient has an active gag reflex
- Aim for 94-98% SpO²
- Ensure Adequate perfusion
- If hypotensive titrate IV fluids to effect- see chart
- Temperature
- Keep the patient cool- unless profoundly hypothermic (<30C). Induction of therapeutic hypothermia optimises neurological outcome
- Glucose Control
- Maintain normoglycaemia and avoid hypoglycaemia

Calculations:
If no chart available, then:
- Weight:
  - 9 or less: (age + 4) x 2
  - 10 years and over: age x 3.3 kg
- Systolic BP 80 + (age x 2).
CALCULATIONS AS PER ARC GUIDELINE FOR 50TH PERCENTILE

NB: 1:1000 Adrenaline (1mg/1ml) should be added to 9 ml of saline to make 1:10000 solution. 1ml contains 0.1mg of adrenaline, so 0.1ml = 10mcg.

<table>
<thead>
<tr>
<th>AGE</th>
<th>WT</th>
<th>SBP</th>
<th>LMA</th>
<th>4J/KG</th>
<th>ADRENALINE 10MCG/KG 0.1ml/kg</th>
<th>AMIODARONE 5mg/kg</th>
<th>GLUCOSE 2.5ML/KG OF 10%</th>
<th>FLUID 20ml/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3.5kg</td>
<td>70</td>
<td>1</td>
<td>10J</td>
<td>35mcg=0.35ml</td>
<td>17.5mg=0.35ml</td>
<td>8.75ml</td>
<td>70ml</td>
</tr>
<tr>
<td>2m</td>
<td>5kg</td>
<td>80</td>
<td>1-1.5</td>
<td>20J</td>
<td>50mcg=0.5ml</td>
<td>25mg=0.5ml</td>
<td>12.5ml</td>
<td>100ml</td>
</tr>
<tr>
<td>5m</td>
<td>7kg</td>
<td>80</td>
<td>1.5</td>
<td>30J</td>
<td>70mcg=0.7ml</td>
<td>35mg=0.7ml</td>
<td>17.5ml</td>
<td>140ml</td>
</tr>
<tr>
<td>1</td>
<td>10kg</td>
<td>82</td>
<td>1.5-2</td>
<td>50J</td>
<td>100mcg=1ml</td>
<td>50mg=1ml</td>
<td>25ml</td>
<td>200ml</td>
</tr>
<tr>
<td>2</td>
<td>12kg</td>
<td>84</td>
<td>2</td>
<td>50J</td>
<td>120mcg=1.2ml</td>
<td>60mg=1.2ml</td>
<td>30ml</td>
<td>240ml</td>
</tr>
<tr>
<td>3</td>
<td>14kg</td>
<td>86</td>
<td>2</td>
<td>50J</td>
<td>140mcg=1.4ml</td>
<td>70mg=1.4ml</td>
<td>35ml</td>
<td>280ml</td>
</tr>
<tr>
<td>4</td>
<td>16kg</td>
<td>88</td>
<td>2</td>
<td>70J</td>
<td>160mcg=1.6ml</td>
<td>80mg=1.6ml</td>
<td>40ml</td>
<td>320ml</td>
</tr>
<tr>
<td>5</td>
<td>18kg</td>
<td>90</td>
<td>2</td>
<td>70J</td>
<td>180mcg=1.8ml</td>
<td>90mg=1.8ml</td>
<td>45ml</td>
<td>360ml</td>
</tr>
<tr>
<td>6</td>
<td>20kg</td>
<td>92</td>
<td>2.5</td>
<td>70J</td>
<td>200mcg=2ml</td>
<td>100mg=2ml</td>
<td>50ml</td>
<td>400ml</td>
</tr>
<tr>
<td>7</td>
<td>22kg</td>
<td>94</td>
<td>2.5</td>
<td>100J</td>
<td>220mcg=2.2ml</td>
<td>110mg=2.2ml</td>
<td>55ml</td>
<td>440ml</td>
</tr>
<tr>
<td>8</td>
<td>25kg</td>
<td>96</td>
<td>2.5</td>
<td>100J</td>
<td>250mcg=2.5ml</td>
<td>125mg=2.5ml</td>
<td>62.5ml</td>
<td>500ml</td>
</tr>
<tr>
<td>9</td>
<td>28kg</td>
<td>98</td>
<td>2.5</td>
<td>100J</td>
<td>280mcg=2.8ml</td>
<td>140mg=2.8ml</td>
<td>70ml</td>
<td>560ml</td>
</tr>
<tr>
<td>10</td>
<td>32kg</td>
<td>100</td>
<td>3</td>
<td>150J</td>
<td>320mcg=3.2ml</td>
<td>160mg=3.2ml</td>
<td>80ml</td>
<td>640ml</td>
</tr>
<tr>
<td>11</td>
<td>36kg</td>
<td>102</td>
<td>3</td>
<td>150J</td>
<td>360mcg=3.6ml</td>
<td>180mg=3.6ml</td>
<td>90ml</td>
<td>720ml</td>
</tr>
<tr>
<td>12</td>
<td>40kg</td>
<td>104</td>
<td>3</td>
<td>150J</td>
<td>400mcg=4ml</td>
<td>200mg=4ml</td>
<td>100ml</td>
<td>800ml</td>
</tr>
<tr>
<td>13</td>
<td>46kg</td>
<td>106</td>
<td>3</td>
<td>200J</td>
<td>460mcg=4.6ml</td>
<td>230mg=4.6ml</td>
<td>100ml</td>
<td>920ml</td>
</tr>
<tr>
<td>14</td>
<td>50kg</td>
<td>108</td>
<td>3-4</td>
<td>200J</td>
<td>500mcg=5ml</td>
<td>250mg=5ml</td>
<td>100ml</td>
<td>1000ml</td>
</tr>
</tbody>
</table>
Newborn Life Support

At all stages ask: do you need help?

Term gestation? Breathing or crying? Good tone?

Yes
- Prevent heat loss
- Ensure open airway
- Stimulate

No
- Stay with mother

HR below 100? Gasping or apnoea?

Yes
- Positive pressure ventilation
- SpO₂ monitoring

No
- Laboured breathing or persistent cyanosis?

Yes
- Ensure open airway
- SpO₂ monitoring
- Consider CPAP

No
- Post-resuscitation care

HR below 100?

Yes
- Ensure open airway
- Reduce leaks
- Consider increasing pressure & oxygen

No

HR below 60?

Yes
- Add chest compressions
- 3 compressions to each breath
- 100% oxygen
- Consider intubation or LMA

No

HR below 60?

Yes
- Venous access, adrenaline
- Consider volume expansion

Targeted pre-ductal SpO₂ after birth
1 min 60-70%
2 min 65-85%
3 min 70-90%
4 min 75-90%
5 min 80-90%
10 min 85-90%

Adrenaline IV 10-30 mcg/kg (0.1-0.3 mL/kg of 1:10,000 solution)
NEWBORN LIFE SUPPORT

The term ‘Newborn’ refers to the infant in the first few minutes to hours following the birth.

The initial APGAR score assessment should be conducted 1 minute following birth then again at 5 minutes; then 5 minutely.

<table>
<thead>
<tr>
<th>APGAR Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong>&lt;br&gt;(skin colour)</td>
<td>Bluish-gray or pale all over</td>
<td>Normal colour (but hands and feet bluish)</td>
<td>Normal colour all over (hands and feet are pink)</td>
</tr>
<tr>
<td><strong>Pulse</strong>&lt;br&gt;(heart rate)</td>
<td>Absent (no pulse)</td>
<td>Below 100bpm</td>
<td>Above 100bpm</td>
</tr>
<tr>
<td><strong>Grimace</strong>&lt;br&gt;(Responsiveness or reflex irritability)</td>
<td>Absent (no response to touch)</td>
<td>Facial movement only (grimace with stimulation)</td>
<td>Cries, pulls away, with stimulation</td>
</tr>
<tr>
<td><strong>Activity</strong>&lt;br&gt;(muscle tone)</td>
<td>No movement limp</td>
<td>Arms and legs flexed with little movement</td>
<td>Active, Spontaneous movement</td>
</tr>
<tr>
<td><strong>Respiration</strong>&lt;br&gt;(rate and effort)</td>
<td>Absent (not breathing)</td>
<td>Slow or irregular breathing</td>
<td>Normal rate and effort good cry</td>
</tr>
</tbody>
</table>

**MANAGEMENT:**

Effective ventilation is the key to successful neonatal resuscitation.

- Dry the baby, provide warmth and clear the airway. Assess APGAR.
- Newborn heart rates vary between 110 and 160bpm. If the heart rate falls below 100bpm then positive pressure ventilation should commence, preferably with room-air. First breaths inflate gently to aerate and expand lungs. The ventilation rate is 40-60/minute.
- Chest compressions are indicated when the heart rate remains <60bpm after ventilation for 30 seconds. Supplemental oxygen is then preferred to room-air. Chest compressions: padding under shoulders to accommodate large occiput, two-thumb technique (preferably over two-finger technique), centred over lower third of sternum, 1/3 chest depth. 3:1 ratio-90 compressions and 30 breaths /minute.
- Medications and fluids are rarely indicated for resuscitation of newborn infants. Bradycardia is usually caused by hypoxia and inadequate ventilation and apnoea is due to insufficient oxygenation of the brainstem. However, If adequate ventilation and chest compressions have failed to increase the heart rate to >60 bpm, then IV/IO adrenaline is indicated ASAP. 10-30mcg/kg (0.1-0.3 ml/kg of 1:10000; 1ml contains 0.1mg of adrenaline, so 0.1ml = 10mcg).
Supplemental Oxygen During Resuscitation:

- Blood oxygen levels of normal newborns can take up to 10mins to achieve a SpO\textsuperscript{2}\% of 90\% or greater. It is noted that insufficient oxygenation can impair organ function and cause injury, however new evidence is also suggesting that brief exposure to excessive oxygenation can be harmful to the newborn during and after resuscitation.

- For term babies, commencement of resuscitation in room air is highly recommended, whereas premature babies have been found to benefit from resuscitation with a combination of room and air and oxygen.

- Regardless of the gestation, the goal of oxygen administration is to meet the saturation percentages for the table below. If a neonate is struggling to meet the lower end of the target, an increase in oxygen is recommended. If the neonate’s saturations reach 90\% whilst on supplemental oxygen, reduce the concentration of the oxygen. Pulse oximetry is recommended - colour is no longer considered an accurate indicator of perfusion in the newborn.

<table>
<thead>
<tr>
<th>Time from birth</th>
<th>Target SPO2 for newborn infants during resuscitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 minute</td>
<td>60 - 70%</td>
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<tr>
<td>2 minutes</td>
<td>65 - 85%</td>
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<tr>
<td>3 minutes</td>
<td>70 - 90%</td>
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<tr>
<td>4 minutes</td>
<td>75 - 90%</td>
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<tr>
<td>5 minutes</td>
<td>80 - 90%</td>
</tr>
<tr>
<td>10 minutes</td>
<td>85 - 90%</td>
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Post Resuscitation Care:

Post resuscitation care of a newborn focuses on maintaining oxygen saturation, heart rate, respiratory rate and transporting the patient to an appropriate neonate special or intensive care unit.

- Ensure adequate oxygenation and ventilation
  - Confirm airway placement (size 1 LMA > 34 weeks), especially after moving patient
  - Ventilate at 40-60 per minute
  - Remove advanced airway if patient has an active gag reflex
  - Aim for target oxygen saturation level as per chart above

- Ensure Adequate perfusion
  - Titrate IV fluids to effect 10ml/kg

- Temperature
  - Ideally newborns need to be dried and warmed. Hypothermia can increase oxygen consumption and impede effective resuscitation. Induction of therapeutic hypothermia optimises neurological outcome but is best done in a controlled NICU.
- Glucose Control
  - Newborns that require resuscitation are at risk of developing hypoglycaemia. Hypoglycaemia in the newborn infant post cardiac arrest exacerbates hypoxic induced brain injury.

**Commencing Resuscitation:**
Resuscitation should be commenced on ALL patients except in the following circumstances:

- Death has clearly occurred
  - Rigor mortis/ lividity present
  - Injuries incompatible with life
  - Body decomposition
- Palliative Care patient
  - Where death was expected and imminent due to that illness
- Advanced Directive
  - Where it is clearly communicated that it was the patients expressed wishes not to be resuscitated
  - Where there is doubt as to this advanced directive- resuscitation should be initiated

**Terminating Resuscitation:**
Where resuscitation was commenced the following clinical decision rule to terminate resuscitation efforts should be used.

Terminate resuscitation on scene where:

- Maximum authorised guideline directed resuscitation effort has occurred for at least 20 minutes and
- The patient is in Asystole (confirmed in 2 leads) and
- No shock was delivered during the resuscitation and
- The arrest was not paramedic/ officer witnessed

It is appropriate to terminate resuscitation where additional information comes to hand that clearly indicates that the commencement of resuscitation was inappropriate (Palliative care, advanced directive).

**Documentation:**
Documentation for all resuscitation attempts should be thorough to provide an accurate clinical picture of the event and should include:

- Patient details
- Clinical assessment
- All clinical care given- all ALS attempts and reasons for non- attempts/difficulties
- Vital signs and ECG trace
- Outcome on arrival at ED
CPR SKILL

Locating the site for chest compressions
Place hands on the lower half of the sternum- too high is ineffective and too low may cause regurgitation and/or damage to internal organs.

Method of compression

Infants:
- The two-finger technique may be used to minimise transfer time from compression to ventilation, particularly for single rescuers (figure 1).
- The two-thumb technique is the strongly preferred technique for health care rescuers, whereby the hands encircle the chest and the thumbs compress the sternum, taking care not to interfere with inspiration (figure 2).

Children and Adults:
- Young child: chest compressions can be performed with the ‘heel’ of one hand (figure 1) or the two-handed technique (figure 2).
- Older child and adults-two handed technique (figure 2).
- Victims should be placed supine on a firm surface to optimise the effectiveness of compressions
- Interruptions to chest compressions must be minimised with no more than 10 seconds off the chest
- Rescuers should allow complete recoil of the chest after each compression

**Depth of Compression**
The lower half of the sternum should be depressed approximately one third of depth of the chest with each compression. This equates to more than 5cm in adults, approximately 5cm in children and 4cm in infants.

**Rate of Chest Compression**
100 compressions per minute, even though 100 will not be delivered due to interruptions for breaths.
- Newborn: 3:1, 90 compressions, 30 breaths
- Infant/children <14: 15:2, 10 cycles in 2 minutes
- Adult: 30:2, 5 cycles in 2 minutes

**CPR Quality**
If feasible change rescuers every 2 minutes to prevent fatigue and deterioration in CPR quality, with minimal interruptions to the chest.
**TRAUMA**  
**INTRA-OSSEOUS ACCESS**  
May 2011

<table>
<thead>
<tr>
<th>Description</th>
<th>Contra-indications</th>
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</table>
| Intra-osseous (IO) access is an effective route for fluid resuscitation and drug therapy that may be attained in all age groups. The bone marrow functions as a non-collapsible venous access route and allows medications and fluids to enter the central circulation within seconds. IO access is obtained using one of the following devices: | ▪ Fracture to the targeted bone  
▪ IO within last 48 hours in the targeted bone  
▪ Inability to locate landmarks or excessive tissue  
▪ Prosthetic limb or joint (near insertion point) |
| ▪ Bone Injection Gun (BIG)  
▪ EZ-IO | |

<table>
<thead>
<tr>
<th>Indications</th>
<th>Relative contra-indications</th>
</tr>
</thead>
</table>
| ▪ Cardiac arrest.  
▪ Two failed intravenous (IV) access attempts, or where it is believed IV access cannot be obtained within 90 seconds, **AND** fluid resuscitation and/or drug therapy is urgently required. | ▪ Infection at the insertion site/ in targeted bone  
▪ Osteogenesis imperfecta (brittle bone disease) and Osteoporosis (Bone Injection Gun only)  
▪ Ipsilateral femoral fracture (for IO attempts in lower limbs)  
▪ Existing trauma at the insertion site |  

### Details

**Adult location:**  
▪ Proximal tibia  
▪ Distal tibia  
▪ Proximal humerus  

**Paediatric (< 12 years) location:**  
▪ Proximal tibia

### Precautions

▪ Previous orthopaedic procedure to targeted limb

### Complications

▪ Extravasation / compartment syndrome  
▪ Incorrect siting of needle in bone  
▪ Osteomyelitis (infection of the bone or bone marrow)  
▪ Physeal (growth) plate injury  
▪ Local infection  
▪ Pain – local anaesthesia may be required
Management

Trauma patients must be assessed quickly and transported to an appropriate facility as soon as possible. Good patient outcome in trauma cases is based on assessment skills and results from:
- Early recognition
- Clearly defined priorities
- Early notification
- Early preparation by receiving facility

Allowing for access and extrication an Ambulance Officer’s objective for scene time should be a maximum of twenty minutes.

Assessment of Trauma Patients:

Primary Survey
The objective of the initial assessment is to rapidly identify life threats. If life threats are present, CORRECT them! If they can’t be corrected:
- Support ABCs
- P1 transport with notification.

Danger: Self, others and patient.

Response: Note: initial level AVPU.

Airway: Open, check for adequacy, note potential problems, and control the spine. Anticipate potential for deterioration.

Breathing: Respiratory noises and effort, skin colour, effectiveness of breathing. (Part or totally obstructed airway, or damage to breathing mechanism). Oxygenate ASAP! Assist ventilation as required. Expose, palpate and auscultate if appropriate.

Circulation: Manage severe external bleeding and stabilise limb fractures. Note presence and quality of pulse, especially distal to an injury. Assess pulse; absent radial = systolic BP < 80, absent carotid = systolic BP < 60. Consider internal haemorrhage. Manage shock as per CPG Circulation 4.5 Shock.
**Disability:** Level of Consciousness = best brain perfusion indicator. Use AVPU initially then assess Glasgow Coma Scale
In trauma patients decreased conscious state = shock or head injury until proven otherwise!

**Exposure:** It is important to remember that you can’t treat what you don’t find. If you don’t look, you won’t see! Remove **APPROPRIATE** clothing from critical patients ASAP. Cover patient with blanket when finished.

**Special Notes:**
- Avoid delaying resuscitation.
- If patient trapped refer to CPG Trauma 5.13 Trapped Patient.
- Minimum time on scene, maximum treatment en route.
- If still unconscious and/or airway impaired after Primary Survey, patient should be placed in the lateral position with cervical spine stabilisation if indicated.
- It should take 30 seconds or less for primary assessment.
- With critical trauma you may never get beyond primary survey.
- A blood pressure or an exact respiratory or pulse rate should NOT be necessary to tell that your patient is critical!

**Vital Signs Survey**
- Includes:
  - Glasgow Coma Scale (GCS).
  - Pulse.
  - Respiration.
  - Blood Pressure.
  - Oxygen saturation.
  - BSL if indicated.
- Record first set of Vital Signs within 5 minutes if possible.
- Repeat according to patient condition.
- Complete at least one more set en route.

**Note:** Baseline neurological status, level of consciousness – **record.**
The Time Critical Patient

Identify time critical patient ASAP at scene using criteria (see below). Notify receiving facility of type of problem and ETA using CPG General 1.9 DeMIST. Use words from criteria e.g. “high speed rollover”, “patient ejected”, “fell 5 metres”.

<table>
<thead>
<tr>
<th>A. HISTORY</th>
<th>C. VITAL SIGNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High speed MVA &gt; 60 kph.</td>
<td>1. Systolic BP &lt; 100.</td>
</tr>
<tr>
<td>2. MVA with rollover or fatality of same car occupant.</td>
<td>2. Respiratory rate &lt; 10, &gt; 20.</td>
</tr>
<tr>
<td>3. Accident involving cyclist, motorcyclist or pedestrian hit at 30 kph or more.</td>
<td>3. GCS &lt; 12.</td>
</tr>
<tr>
<td>4. Patient ejected or trapped.</td>
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<tr>
<td>5. Fell &gt; 3m (10 ft).</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>B. INJURIES</th>
<th>D. MULTIPLE PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Head injury with decreased conscious state.</td>
<td>1. Multi-casualty or disaster situation.</td>
</tr>
<tr>
<td>2. Spinal cord injury.</td>
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<tr>
<td>3. Chest injury with impaired respiration.</td>
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<tr>
<td>5. Major pelvic fracture.</td>
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<tr>
<td>6. Two or more proximal long bone fractures.</td>
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<tr>
<td>7. All penetrating injuries to head, neck, chest, abdomen, pelvis, groin and back.</td>
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</table>

INTER-HOSPITAL TRANSFERS

1. Any inter-hospital transfer with Vital Signs as above.

Detailed Exam

Secondary Survey:

- Perform only after initial assessment is completed and life threats corrected.
- Do not delay critical patients in field for detailed exam.
- Keep it stepwise, organised.
- Head to toe; distal to proximal.
- Every patient, same way, every time!!
History

Mechanism and Patterns of Injury:
- Cause; Implements, trajectory, force.
- Vehicle; Speed, conditions (windscreen, steering wheel, seat belts).
- Patient complaints; Onset, quality, duration, made worse/better?
- Other associated symptoms; Pain — location — radiation.

Chief complaint: What patient says problem is, not necessarily what you see.

Relevant History:
- A = Allergies
- M = Medications
- P = Past medical history
- L = Last oral intake
- E = Events leading up to incident
- Gather information whilst managing major problems and doing primary, Vital Signs and secondary surveys.
- Remember, bystanders, relatives and carers as information sources.

Differential Diagnosis: always consider other causes and conditions.
- Medical e.g. hypoglycaemia, epilepsy, stroke, heart attack etc. may all be causes of the trauma.
- Other trauma e.g. was the driver hit by something thrown through the window.

Other Considerations:
- Recognise environmental hazards — to you or others.
- Call for backup – early if needed.
- Identify yourself clearly.
- Identify number of patients.
- Initiate a triage system, if indicated.
- Initiate communication as needed.
Definitive Field Care:
- Should be performed only on stable patients.
- Reassess carefully for hidden problems and if patient becomes unstable at any time, **TRANSPORT**.

Revaluation:
- Monitor ventilation and perfusion status.
- Repeat Vital Signs.
- Continued stabilisation of identified problems.
- Continued reassessment for unidentified problems and potential for deterioration.

Special Considerations are included in CPG’s:
- Communication Procedure (CPG General 1.9 DeMIST)
- Shock (CPG Circulation 4.5)
- Spinal Injury (CPG Trauma 5.2)
- Fractures, Dislocations and Sprains (CPG Trauma 5.5)
- Haemorrhage (CPG Trauma 5.4)
- Facial Injuries (CPG Trauma 5.6)
- Eye Injuries (CPG Trauma 5.7)
- Head Trauma (CPG Trauma 5.8)
- Chest Injuries (CPG Trauma 5.9)
- Abdominal Injuries (CPG Trauma 5.11)
- Penetrating Injuries (CPG Trauma 5.12)
- Trapped Patient (CPG Trauma 5.13)
- Amputated Parts (CPG Trauma 5.14)
- Burns (CPG Trauma 5.15)
- Electrocution (CPG Trauma 5.17)

Blunt verses Penetrating Trauma:
- Fluid resuscitation should only be commenced after control of the bleeding point. Penetrating injuries (stabbing, shooting) to the trunk (chest and abdomen) cause large holes in blood vessels and organs that cannot be controlled pre-hospital. Aggressive fluid resuscitation in these patients increases bleeding and is thought to be harmful.
- Blunt trauma to the trunk is usually associated with shearing type internal injuries. Bleeding from these injuries can be controlled by the body’s mechanisms. Fluid resuscitation in these patients may restore vital organ perfusion.
- Bleeding from limb trauma can be controlled with local pressure.
Indications for Fluid Resuscitation:

- **Head, Neck and Limb Trauma:**
  - As per **CPG Circulation 4.5 Shock**

- **Blunt Truncal Trauma:**
  - As per **CPG Circulation 4.5 Shock**

- **Penetrating Truncal Trauma:**
  - Fluid resuscitation to maintain IV access only (TKVO 20dpm) if trained and authorised.
  - Rapid extrication and transport to definitive care is the appropriate pre-hospital management.
Spinal immobilization follows common principals of fracture management; that is to immobilize a joint above and below the injury. Spinal injuries are often associated with more than one area of the spine and as such the entire spine should be immobilised.

**Management:**

- **Danger, Response, Airway, Circulation, Disability, Exposure**
- Oxygen
- Always stabilize cervical spine in neutral head/neck position.
- If BLS airway management is performed this should be by jaw thrust only, not head tilt.
- Complete CNS survey as appropriate (Skill 103).
- Manage fractures and pain as appropriate.
- Monitor Vital Signs and transport to appropriate facility.

**Paediatric**

The paediatric patient's head is relatively large in proportion to body size. This, combined with the reduced development of their posterior thoracic muscles produces hyperflexion when placed on a LSB. Padding beneath the torso and shoulders will reduce hyperflexion.

**Notes**

- Cervical collar does not immobilize the cervical spine. If there is need for a cervical collar, then there is need for full spinal precautions. Patients must not be walked with a cervical collar.
- Minimal force is required to injure a diseased vertebral column.
- Disease process may not allow for neutral positioning of the vertebral column (e.g.: Kyphosis). If there is significant deformity patients should be transported in a position of comfort.
- Spine boards must be well restrained to the stretcher before transport.
- Patients that are not time critical must be removed from the LSB prior to transportation. Pressure sores can develop in less than 30 minutes in patients with spinal cord injury.
- Treat signs of neurogenic shock secondary spinal injury as per CPG 4.5 (Shock).
- Consider other causes of hypotension (i.e. trauma) if tachycardia is present.
- Injuries above T6 can cause a loss of temperature regulation (poikilo-thermic). Consider environmental exposure and adapt management accordingly.
- Spinal immobilization has potential risks to the patient. These include pressure necrosis and respiratory compromise.
Indications for spinal immobilization

Spinal immobilization is indicated where any of the following assessment findings are present associated with trauma.

- GCS < 15
- Spinal pain/ tenderness/ deformity
- Neurological deficit
- Significant mechanism of injury in conjunction with alcohol/drug intake or distracting injury or inability to communicate.

Note: Significant mechanism of injury is defined as:

- Any mechanism producing a violent impact to the head, neck, torso or pelvis.
- Incidents producing sudden acceleration/deceleration or lateral forces to neck or torso.
- Any fall.
- Ejection from any powered transportation device eg: skateboards, scooters, motor vehicles.
- Any shallow-water diving incident

Distracting injury is defined as:

- Any injury that has potential to impair the patient’s ability to recognize other injuries eg: burns, long bone fractures, large laceration, degloving injury, crush injury.

Inability to communicate is defined as:

- Any patient who cannot communicate in a way that assists with their assessment eg: small children, hearing impaired, foreign language.
SPINAL CORD INJURY CARD
THE LEVEL AT WHICH SENSATION IS ALTERED
OR
ABSENT IS THE LEVEL OF INJURY

IT IS VITAL TO CARRY OUT MOTOR AS WELL AS SENSORY EXAMINATIONS AS THE PATIENT MAY HAVE MOTOR DAMAGE WITHOUT SENSORY DAMAGE AND VICE VERSA.

SENSORY EXAMINATION

1. Examine by:
   - Light touch.
   - Response to pain.

1. Use:
   - The forehead as your guide to what is normal sensation.

2. Examine:
   - Upper limbs and hands.
   - Lower limbs and feet.

3. Examine:
   - Both sides.

4. T.4 Examination:
   - Must be carried out in the mid-axillary lines not the mid-clavicular line, as C2, C3 and C4 all supply sensation to the nipple line.

IT IS IMPORTANT TO CARRY OUT ALL OF THE ABOVE AS A VARIETY OF SENSORY CHANGES MAY OCCUR
MOTOR EXAMINATION

THE LEVEL AT WHICH WEAKNESS OR ABSENT MOVEMENT IS NOTED IS THE LEVEL OF INJURY.

Motor Examination: examine both sides

<table>
<thead>
<tr>
<th>UPPER LIMB MOTOR EXAM</th>
<th>LOWER LIMB MOTOR EXAM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ask patient to:</strong></td>
<td><strong>Ask patient to:</strong></td>
</tr>
<tr>
<td>A Shrug Shoulders</td>
<td>A Flex Hip</td>
</tr>
<tr>
<td>B Bend the Elbow</td>
<td>B Extend Knee</td>
</tr>
<tr>
<td>C Push Wrist back</td>
<td>C Pull Foot up</td>
</tr>
<tr>
<td>D Open/Close Hands</td>
<td>D Push Foot down</td>
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THORACIC AND ABDOMINAL MOTOR EXAMINATION

LOOK FOR ACTIVITY OF INTERCOSTAL AND ABDOMINAL MUSCLES

DIAGNOSIS OF SPINAL CORD INJURY IN THE UNCONSCIOUS PATIENT

A Look for paradoxical respiration (a quadriplegic has lost intercostal muscles so he / she relies on the diaphragm to breathe).
B Flaccid limbs.
C Loss of response to painful stimuli below the level of the lesion indicates patient may be QUADRIPLEGIC.
D Loss of reflexes below level of lesion.
E Erection in the unconscious male.
F Low BP (systolic < 100mmHg) associated with a normal pulse or bradycardia.

IF YOU DON'T THINK ABOUT SPINAL CORD INJURY YOU WILL MISS IT!!
CONTROL SIGNIFICANT BLEEDING FIRST

Specific information required:
- How much, how long?
- Cause?
- Associated problems?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Origin.
- Estimate loss where possible.
- Arterial, venous, multiple.

Management — General:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Stop bleeding. Direct pressure with hand, pressure bandage over dressings.
- **Oxygen**, high concentration or 100%.
- Elevation injury site if possible.
- Arterial tourniquets for limb bleeding should be avoided if possible and only used if direct pressure is impossible e.g.:
  - Bleeding area too large for direct pressure to be applied, e.g. traumatic amputation.
  - Bleeding area inaccessible to direct pressure, e.g. trapped limb.
  - Insufficient assistants to apply direct pressure.
- A suitable tourniquet is a sphygmomanometer cuff, which is inflated above systolic pressure. If a tourniquet is applied it should be left in full view, not covered by bandages and the time of application should be noted clearly on patient record form. Report at hospital handover.
- Only give fluid infusion if bleeding point controlled. If IV unattainable and transport time prolonged, consider oral rehydration, little and often.
- Cover the patient to prevent heat loss. Don't overheat — it will dilate vessels, and cause hypotension.
- **Avoid jolting, rough and excessive handling** — it can precipitate a drastic fall in blood pressure in the hypovolaemic patient.

Management of Haemorrhage — Special areas:
Epistaxis:
- Squeeze the nose firmly just below the nasal bones.
- If still bleeding, consider Cophenylcaine spray, as instructions on bottle.

**Obstetric bleeding** (following miscarriage or delivery)
If the bleeding is immediately post-partum, gentle massage of the fundus of the uterus can stimulate contraction and may stop the bleeding. Do not push uterus down into pelvis. In severely shocked patients consider elevation, cannulation, fluid infusion if no other option is available. If desperate, try supra-pubic compression (see CPG Obstetrics and Gynaecology 6.1 Vaginal Bleeding).

**Neck wounds**
If major veins of the neck are severed, do not sit the patient up as air may be sucked in and develop into a venous air embolism. If air embolism occurs, lie the patient down and administer 100% Oxygen. Apply local pressure with broad pad and hand (signs of air embolism — sudden deterioration, collapse, neurological changes).

**Gastro-intestinal bleeding**
Present as haematemesis or passage of melaena or bright blood in stools. If the patient is shocked, consider elevation, cannulation and fluid infusion. May present only as abdominal pain, pale, sudden faintness.

**Internal bleeding**
Usually requires urgent surgery to secure the bleeding point. Consider elevation, cannulation, fluid infusion if no other option is available, to control abdominal or lower limb bleeding temporarily while patient is rapidly transported to hospital.
Specific information needed:
- History of trauma (scene analysis).
- Mechanism and pattern of injuries.

Specific physical findings:
- Localised pain, tenderness.
- Loss of function, limitation of motion, guarding.
- Swelling, discolouration.
- Bizarre angulations, deep lacerations, exposed bone fragments.
- Crepitus (but do not actively seek).
- Quality of distal pulses and sensation (vessels or nerves may be affected by fracture).
- Secondary Survey completed where possible (Skill 102).

Management:
- **Oxygen**, high concentration or 100% as indicated.
- Stabilise cervical spine if indicated.
- Complete Secondary Survey as appropriate (Skill 102).
- Examine for additional injuries, evaluate, and treat if necessary those with higher priority.
- Analgesia as required, with Oxygen whenever possible (Oxygen needed in the local injured area, to preserve damaged tissues).
- Apply sterile dressing to open fractures.
- Splint as indicated. Elevate simple fractures (Skill 901).
- Splint and apply cold packs (where practical) to dislocations, joint damage, and bad displaced fractures as found.
- Check distal circulation frequently; adjust injury and splint position if needed, to maintain peripheral circulation.
- Transport as necessary. Monitor circulation (pulse and skin temperature), sensation, and motor function distal to site of injury.
Specific precautions / notes:

- Fractures do not necessarily lead to loss of function, e.g. impacted fractures may cause pain but little or no loss of function.
- Do not allow severely angulated, open, bloody fractures to distract you, e.g. a punctured lung with impending respiratory arrest!
- Extremity injuries benefit from appropriate care, but are of low priority in a patient with multiple injuries, unless pouring blood dangerously.
- Do not apply ice or cold packs directly to skin.
Specific information needed:
- How it happened.
- Pain.
- Any difficulty speaking or breathing.
- Any numbness, loss of function.
- Bystander information.

Special physical findings:
- Breathing.
- Any signs of airway obstruction.
- Bony distortion with fractures.
- Soft tissue swelling.
- Bleeding.
- Laryngeal injury.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- If routine airway management of head tilt, jaw lift, positioning on side and suction is insufficient, you may need to use an airway or advanced airway management.
- Airway obstruction may be major problem due to:
  - Bony distortion with fractures.
  - Soft tissue swelling.
  - Laryngeal injury.
- Control bleeding with pressure and elevation if no major neck veins open.
- Pain relief — analgesia should be administered if practicable.

Specific precautions / notes:
- Even disfiguring injuries may leave the airway clear if you place the patient in a good posture. Occasionally prone posture is needed, and this will ensure an adequate airway and drainage of blood and secretions.
- Think of the possibility of associated spinal injury, and take appropriate precautions.
- Do not raise head if there are lacerations of major neck veins, which may lead to venous air embolism (air entering the venous system, and heart).
- Laryngeal injury may lead to upper airway obstruction.
- Signs include:
  - Loss of voice.
  - Inspiratory stridor.
  - "Seesaw" breathing.
- Subcutaneous emphysema in the neck (air under the skin — causes swelling, and "crinkly" feeling to touch).
- If these occur the patient must be transported immediately to hospital. PRIORITY 1 and advise hospital — CPG General 1.9 DeMIST Procedure.

Critical Points for the Patient Record
- History especially airway problems, and presence or absence of cervical spine injury.
Specific information needed:
- History of events.
- Mechanism, nature and time of injury.
- Associated problem, pain.
- Any relevant previous eye history.

Specific physical findings:
- Vital Signs.
- Orbit for bruising, swelling, tenderness, laceration.
- Lids for bruising, swelling, tenderness, laceration.
- Conjunctiva for redness, foreign body, pus.
- Globe for redness, laceration, abnormal colour.
- Pupil size, shape, equality, reaction, blood in the eye itself?
- Eye movements for abnormalities.
- Visual acuity. **Always** check for blurred vision or double vision. (deterioration of vision is an early sign of damage, e.g. penetration by tiny high-speed fragments).
- Symptoms of retinal detachment include a history of flashes, the presence of floating black specks and curtain-like narrowing of peripheral vision. **Note**: retinal detachment may occur spontaneously or be related to injury.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Oxygen, high concentration or 100%. Avoid pressure from mask on eye.
- Irrigate eye with clean water if foreign material, and no chance of perforation.
- Monitor Vital Signs.
- Cover the eye with a dressing moistened with sterile water (saline from the treatment or IV infusion kit).
- Cover and protect with eye shield or cup or similar and tape in place.
- Avoid direct pressure on eye. Handle gently.
- Reassure constantly. Ask patient to fix eye on an object. This minimises movement, avoids covering both eyes.
- Smooth steady transport.
Specific precautions / notes:

- Do not remove protruding foreign bodies.
- If the eyeball is extruded do not attempt to push it back into the socket.
- The injured eye must be protected from rubbing, pressure etc. The best protector is an eye shield which does not exert pressure on the eye — this is particularly important with lacerations of the eyeball or lids. If an eye shield is unavailable then a loosely applied eye pad can be taped in position.
- The **non-injured eye should NOT be padded** as this causes needless panic and disorientation in the patient. Ask patient to look steadily at a fixed point.

Chemical burns — Caustic Soda, Lime etc:

- Irrigate immediately with copious quantities of water or saline. Continue irrigation during transport for at least 20 minutes.
- The eyelids must be pulled apart to ensure the fluid washes the eye.

Capsicum Spray:

- Have patient remove contact lens where possible. Flush lens out with sterile saline to protect lens. If urgent flush out with water or saline, but be prepared to throw away lens. Soft lenses which are predominant today cannot tolerate tap water.
- Treat as for chemical burns.

Scalds and electrical flash burns:

- No dressing is required; ice packs can be beneficial, self-held by patient.

Foreign body on cornea:

- Protect the eye with a shield or pad.
- Do not attempt to remove the foreign body, unless it is loose and easily visible, use sterile saline / water to flush away or cotton wool bud soaked with sterile saline / water. Do not use a tissue as fibres can be left behind.

EYES — DUST, SMOKE ETC

Specific information needed:

- How it happened.
- Pain — type, what makes it worse?
- Effect on vision.
Specific physical findings:
- Swelling, inflammation, damage to lids.
- Spasm of eyelids — difficulty opening.
- Lacrimation (tears).
- Redness, oedema of conjunctiva.
- Blurring of vision, halos.

Management:
- Avoid rubbing.
- Gentle separation of lids.
- Gently irrigate with water or saline via IV set.
Assume cervical injury until proved otherwise Refer to Indications for Spinal Precautions (CPG Trauma 5.2 Spinal Injury).

Specific information needed:

History:
- Mechanism of injury.
- Estimate of force involved, potential for concealed injury.
- Change in level of consciousness since injury.
- Amnesia for events prior to and / or following trauma.
- With motorcycle, bicycle and industrial accidents, was a helmet worn?
- Brief relevant past history — medical problems, medications.

Specific physical findings:
- Vital Signs (note respiratory pattern and rate).
- Level of consciousness (GCS). When assessing children less than 14 years of age use AVPU.
- Neurological examination, including pupils and response to stimuli, and record findings. NOTE the differences between sides (Skill 103).
- External evidence of trauma (abrasions, lacerations, etc.).

Management:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Jaw thrust or oropharyngeal airway as needed (noisy breathing is obstructed breathing).
- Be alert for airway problems and / or seizure activity. If indicated, consider advanced airway management.
- Oxygen, high concentration or 100% (ventilate if necessary) to maintain oxygen saturation of at least 90%.
- Immobilise cervical spine with collar and sandbags in neutral head / neck position. Patients with suspected head / neck injury may be agitated and may not tolerate application of collars. Do not force collars on under these circumstances.
- Scalp bleeding may be stopped by direct local pressure. If the underlying skull is unstable, pressure should be applied to the periphery of the laceration over intact bone, using a large pad. If patient has other serious injuries, these will have priority.
If evidence of poor peripheral perfusion, administer IV fluid to maintain cerebral perfusion and conscious level. Try to maintain a systolic blood pressure of at least 90mmHg.

For longer transport times, if practical, manage patient with upper body raised 30° to decrease cerebral oedema (unless hypotensive). Ensure head / neck alignment is maintained.

If altered mental state, check BSL.

Monitor Vital Signs and level of consciousness at scene and during transport.

STATUS CHANGES ARE IMPORTANT. Record findings.

Specific precautions / notes:

- The most important information you provide for the hospital is **TIME SEQUENCE OF LEVEL OF CONSCIOUSNESS**.
- Is the patient stable, deteriorating or improving?
- Assume cervical spine injury in all patients with significant head trauma.
- Any patient with even a transitory loss of consciousness should be assumed to have sustained significant trauma to the brain.
- **IF PATIENT WITH HEAD TRAUMA IS IN SHOCK, LOOK ELSEWHERE FOR POSSIBLE CAUSES. SHOCK IS PROBABLY NOT DUE TO HEAD INJURY.**

Additional Notes:

- Restlessness / aggressiveness can be a sign of hypoxia. **Cerebral hypoxia is the most frequent cause of death in head injury.** A **GOOD AIRWAY IS ABSOLUTELY VITAL.**
- The head injured patient with a compromised airway should be managed in the lateral position while ensuring spinal precautions and providing high concentration O₂ and ventilatory support if required.
- It should be an Officer’s **LAST RESORT** to administer a sedating agent to a head injured patient. Sedating agents such as benzodiazepines can precipitate large falls in blood pressure and depress respirations. These factors contribute to poor patient outcome, significantly increasing mortality. Sedation may be used in small doses when there is **no other option** to facilitate safe and rapid transport.
- An Officer should **NEVER** attempt to sedate for the purpose of intubating head injured patients. This requires large doses of sedation and increases risk of death by three to four times.
TRAUMA
5.9 CHEST INJURIES
(TRAUMATIC RESPIRATORY DISTRESS)
September 2008

Specific information needed:
- Injury; mechanism and estimate of force involved (minor, moderate, severe).
- Brief, relevant past history; medical problems and medications.

Specific physical findings:
- Vital Signs and oxygen saturation.
- Movement of chest wall.
- Obvious chest wounds and location.
- Breath sounds.
- Subcutaneous emphysema and / or crepitus (air under the skin — may indicate pneumothorax or damaged bronchus or trachea).
- Haemoptysis (coughing blood — may indicate damaged lung).
- Tracheal shift from midline (look in the sternal notch — suggests that the increased air pressure in a tension pneumothorax is pushing the heart and trachea over to one side).
- Jugular vein distension (suggests venous obstruction e.g. by bleeding, bruising).
- Increasing difficulty in ventilation by a positive pressure device (developing a pneumothorax?).
- Loss of consciousness (hypoxia?).

Management:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100%, with ventilation if patient is apnoeic, respiration markedly depressed or ineffective.
- Remember urgency of getting chest wounds to hospital (Priority 1 to hospital and notify).
- Open chest wound: cover with occlusive dressing taped on 3 sides only, to allow air to escape but not enter the chest.
- If signs of respiratory distress worsen, indicating tension pneumothorax, try removing the dressing from the wound. If this does not help, treat as absolute emergency and transport Priority 1 to hospital. Notify hospital, (CPG General 1.9 DeMIST Procedure).
- Stabilise rib fractures with patient positioned towards injured side, and / or sandbags. Flail sternum may be stabilised with the flat of a gentle supporting hand.
Impaled objects should be left in place but stabilised.  
Monitor cardiac rhythm.  
Monitor Vital Signs, oxygen saturation and ECG during transport.  
Analgesia with Oxygen.  
Consider elevation, cannulation and fluid infusion.  

Specific precautions / notes:  
- Chest trauma is one of the many situations where "stabilisation in the field" cannot be achieved. Remember to consider how far you are from the nearest facility and how critical the patient is. A patient with a gunshot wound to the chest does not need chest tubes, IV etc., in the street when you are two blocks from the hospital. **Use common sense.**  
- Consider medical causes of respiratory distress which have either caused trauma or been aggravated by it.  
- Chest injuries sufficient to cause respiratory distress are commonly associated with significant blood loss. **Look for hypovolaemia.** This cannot be controlled effectively outside hospital, especially if bleeding is **internal.**
Specific information needed:

- **Pain:**
  - Nature.
  - Duration.
  - Location.
  - Radiation.

- **Associated symptoms:**
  - Nausea, vomiting (bloody or coffee ground).
  - Diarrhoea.
  - Constipation.
  - Melaena.
  - Urinary difficulties.
  - Brief menstrual history (if relevant).
  - Fever.

- **History:**
  - Previous trauma.
  - Abnormal ingestion.
  - Medications.
  - Known diseases.
  - Surgery.

Specific physical findings:

- **Vital Signs.**
- **Abdomen:**
  - Tenderness.
  - Guarding.
  - Rebound tenderness.
  - Rigidity.
  - Obvious bowel sounds.
  - Distension.
  - Tense painful swollen hernias.
- **Vomiting:**
  - Describe nature and the amount.
Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Position of comfort.
- Nil by mouth.
- **If shocked, consider elevation, cannulation and fluid infusion.**
- Give analgesia as needed, with Oxygen.
- Monitor Vital Signs and oxygen saturation during transport.

Specific precautions / notes

Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, etc). Since the bleeding is not apparent, you must think of volume depletion and monitor patient closely to recognise shock.
Specific information needed:

- Chief complaint.
- Mechanism of injury.
- Pain — nature, duration, location, radiation.
- Associated symptoms — nausea, vomiting, haematemesis, referred pain, e.g. shoulder-tip pain, abdominal swelling.
- Urge to urinate (suspicion of pelvic injury, pressing on, or damaging the urethra).

Paediatrics
- Abdominal contents more susceptible to injury:
  - Thin abdominal wall.
  - Horizontal diaphragm — liver and spleen more exposed.
  - Elastic ribs — less protective.
  - Bladder intra-abdominal.
  - Kidney, liver, spleen and duodenum at risk.

- Respiratory compromise may result from diaphragmatic splinting and gastric dilatation.
- Do not rely on blood pressure as an indicator for shock, low blood pressure is an extremely late sign.

Specific physical findings:

- Position and circumstances found.
- Vital Signs and oxygen saturation.
- Abdomen injury marks, penetrating injury, protruding organs, tenderness, guarding, rigidity, pain on coughing.
- Presence or development of shock.
- Blood in urine.
- Abdominal distension (gastric dilatation and / or internal bleeding).
Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Manage circulation as per:
  - CPG Trauma 5.4 Haemorrhage,
  - CPG Trauma 5.11 Abdominal Injuries,
  - CPG Trauma 5.12 Penetrating Injuries,
  - CPG Circulation 4.5 Shock.
- Dress wounds. Cover exposed organs using plastic film, then dry dressings.
- Pain relief with analgesia.
- Nil by mouth.
- Monitor Vital Signs, ECG and oxygen saturation.
- You may not be able to stabilise in the field, only buy time.
- Transport; Position of comfort (legs flexed reduces abdominal pain by lowering the inward pressure of the abdominal wall).
- Consider urgent transport. PRIORITY 1 Advise as per CPG General 1.9 DeMIST Procedure.

Specific precautions / notes:

- Watch for shock. Internal bleeding is a major cause.
- **Do not raise BP if internal bleeding – may renew bleeding. Prevent further falls in blood pressure.**
- **Do not remove penetrating objects from abdomen unless necessary for patient movement. Watch for vomiting.**
Specific information needed:
- Is the scene safe?
- What specifically happened?
- Is the weapon / object still in the patient or in the area?
- Is the patient still bleeding profusely?
- Pain — where, what type, what makes it worse.
- Any effects since injury, e.g. numbness, loss of function.
- Bystander information.

Specific physical findings:
- Vital Signs and oxygen saturation.
- Position, size, length of object.
- Direction of injury. Possibility of part snapped off inside?
- Assess organs likely to have been injured.
- Assess potential for becoming time critical due to internal injury / bleeding.
- Extent of bleeding.
- Evidence of interference with function, sensation.
- Effect on transport and management.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Manage haemorrhage as per CPG Trauma 5.4 Haemorrhage.
- Only give fluid infusion if bleeding point controlled.
- Pain relief with analgesia.
- Monitor Vital Signs, ECG (where possible) and oxygen saturation.
- If truncal trauma you may not be able to stabilise in the field, only buy time.
- Consider urgent transport. PRIORITY 1. Advise as per CPG General 1.9 DeMIST Procedure.

Specific precautions / notes:
- Impaled objects may be trimmed / cut to allow easier transportation. If this must be done — firstly completely stabilise the object so movement does not occur during cutting.
- Do not remove an impaled object unless **absolutely necessary** for example:
  - It is obstructing the airway.
  - It is an intra-cardiac object with cardiac arrest needing external cardiac massage.
  - It cannot be trimmed and **has** to be removed to move the patient.
- Remember that a high velocity missile has a small entry wound, and a large exit wound, with a lot of internal damage.
- Low velocity missiles may stay within the body and ricochet around, or fragment internally.

**Critical points for patient care record:**
- Outline of problem and circumstances.
- Weapon and range.
- Type of injury.

**High pressure Injection injury:**
- Many industries employ various devices that, if accidentally operated in contact with the skin can inject substances such as grease, plastic and paint at great pressure.
- Gently clean the injured area / part.
- Rest and reassure.
- Elevate the affected limb. Applying a resting splint is advantageous
- Refer to urgent medical aid ASAP.
- For digits there is a high risk of amputation if the injury is not treated within 10 hours.
- **Note:** The casualty should **not be given oral fluids or food** as they must remain fasted in anticipation of anaesthesia and surgery being required.
Specific information needed:
- What happened, when, how?
- How did it affect patient?
- Symptoms?
- Bystander information.

Specific physical findings:
- Vital Signs and oxygen saturation.
- Area and extent of injury.
- Effect of compression.
- Resulting limitation of function.
- Possible effects of release.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Always release **as soon as possible**, to minimise damage.
- With serious injuries and you believe the patient will be trapped for longer than 20 minutes notify Communications Centre so that a hospital team and / or helicopter can be tasked if appropriate.
- Manage circulation as per:
  - CPG Trauma 5.4 Haemorrhage.
  - CPG Trauma 5.11 Abdominal Injuries.
  - CPG Trauma 5.12 Penetrating Injuries.
  - CPG Circulation 4.5 Shock.
- Pain relief analgesia, with Oxygen.
- Monitor ECG, Vital Signs and oxygen saturation.
- Monitor closely during extrication. Blood pressure may drop and ECG changes may occur following release of compressive force.
- Document findings before and after extrication.

Specific precautions / notes:
- **A Crush injury** can be caused by a wide range of situations, including crushed by a vehicle, shaft or trench collapse, falling masonry or by commercial presses.
- **The Crush syndrome** is a problem of progressive multiple organ failure that commences some hours after the injury and extends for several days.
In general, the crush syndrome develops after compression of muscle for periods exceeding one hour.

- A debate often arises about when and how the crushing force should be removed. All crushing forces should be removed immediately after the incident if this is physically possible – there are no exceptions. This is particularly important if the crushing forces are applied to the head, neck, chest and/or abdomen. Unless the crushing force is removed from these sites, death may ensue from respiratory failure, heart failure or blood loss.

- When it is physically impossible to remove the crushing force immediately, send for appropriate emergency services.

**DO NOT USE A TOURNIQUET FOR THE MANAGEMENT / PREVENTION OF CRUSH SYNDROME.**

- The presumed cause of immediate death after release from crushing force — potassium and other substances into the blood — has not been supported by published evidence.

- Acute release of a crushing force is likely to be associated with hypovolaemia. Causes of hypovolaemia include direct damage to blood vessels, and occasionally vasodilatation and loss of peripheral resistance following release of a crushing force. The latter is rarely lethal, though it may produce an initial hypotensive episode.

- The longer tissues are crushed, the more severe the potential crush syndrome that will eventually follow. This is the rationale for the early release of all crushing forces.

- The prevention of crush syndrome may include infusion of large volumes of intravenous fluid and/or sodium bicarbonate. While this is optimally started early, there is no evidence that commencing this before release is of benefit.

**Summary**

- All crush victims should be released as soon as possible.

- Sudden deterioration following release has been experienced although the cause has not been identified.

- Treatment principles for pre-hospital care providers are similar to those for non-crushed victims:
  - Airway control.
  - Oxygenation.
  - Management of haemorrhage and hypovolaemia.

**Plus**

- Preparation for potential sudden deterioration:
  - Cardiac monitoring.
  - Defibrillator prepared.
  - Intravenous access where practicable.
Specific information needed:
- Time and mechanism of amputation.
- Care of severed part prior to rescuer arrival.
- Medications, bleeding tendencies, problems with prior surgery.

Specific physical findings:
- Vital Signs and oxygen saturation.
- Excessive bleeding.
- Note what is still attached in partial amputations.

Management:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100%.
  - Analgesia and bleeding control as needed.
  - Consider elevation, cannulation and fluid infusion if shocked.
  - If IV unattainable, consider oral rehydration, little and often.
- Patient:
  - Gently cover stump with sterile dressing or non-stick dressing.
  - Cover with dry dressing. Bandage and elevate.
- Severed part:
  - Wrap in sterile gauze (or similar), preserving all amputated material.
  - Moist with sterile saline if available.
  - Place in watertight container. Place container on ice (do not freeze), or in ice and water, then place in a cooler bag or esky.

Specific precautions / notes:
- Time is of importance to assure viability, but does not justify taking any risks in driving. Priority 1 conditions are rarely needed.
- Partial amputations should be dressed and splinted in alignment with extremity to assure optimum blood flow. Avoid torsion in handling and splinting.
- Do not use dry ice to preserve severed part — too cold — damage to tissues.
- Control all bleeding by direct pressure to preserve tissues.
- Arterial tourniquets for limb bleeding should be avoided if possible and only used if direct pressure is impossible. They cause damage to the vessels and tissues.
Specific information needed:

- **Consider Danger to yourself and others first!**
- Cause of burn and circumstances (chemical, steam, flame, extreme cold, accompanying explosion, toxic fumes).
- Time elapsed since burn. Loss of consciousness? Prior cardiac or pulmonary disease?
- Was the patient in a closed space with steam or smoke? For how long? **Chance of respiratory tract burn.**
- Identify if patient was exposed to any contamination (e.g. cooled off in a dam, local lake). Knowing a source of infection can greatly reduce the time needed to start a definitive antibiotic.

Specific physical findings:

- Vital Signs and oxygen saturation.
- Extent of burns:
  - Description of areas involved.
  - Cause of burn?
- Depth of burns:
  - Partial — redness or blistered only.
  - Full thickness – severely damaged skin or tissues.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Monitor Vital Signs and oxygen saturation.
- Pain relief — cooling with water and providing analgesia. Specific burn dressings/gel/pads or wetted dressings/sheets also provide relief.
- Carefully remove jewellery and clothing unless stuck.
- Cover burned area. Use plastic film, specific burn dressings/gel/pads or wet sheet as appropriate — keep wet and blow air over or fan if possible to maintain cooling. Use water spray for patient comfort.
- Manage circulation as per CPG Circulation 4.5 Shock and CPG Trauma 5.4 Haemorrhage.
- Commence IV fluids if more than 45 minutes from a burns unit, and > 15% burns adult. Refer to fluid resuscitation table CPG Medication 11.19.
- If IV not attainable, consider oral rehydration, little and often, if practicable.
- Monitor cardiac rhythm (where possible).
- Transport and consider requesting bypass to a burns unit directly, if no immediate life threat, and airway, fluids and analgesia managed.
- PRIORITY 1 not necessarily required for burned patients, even with large area burns unless respiratory tract is burned, airway or ventilation compromised or cardiovascular collapse. However, try to arrive at a burns unit within 45-60 minutes from burning.
- CPG General 1.9 DeMIST Procedure description should include extent of burns. Mention regions burned, and estimate percentage by Rule of Nines.

Specific precautions / notes:
- Leave unbroken blisters intact on face, hands and feet. Blisters in other areas can be “de-roofed” with scissors. Do not “pop” blisters with needles.
- Suspect airway burns in any facial burns or burns received in a closed space. Monitor rate and adequacy of ventilation. 100% Oxygen if possible.
- Deaths in the first 24 hours after burn injury are due to either airway burns or fluid loss.
- Consider carbon monoxide and cyanide poisoning in all closed space burns. If suspected, give Oxygen, high concentration 100% where possible (cyanide fumes arise from burning plastics, and are present in the smoke).
- Always consider non-burn injuries.
- Consider bypass to burns unit directly, if patient’s condition permits for:
  - >15% in adult, >10% in child.
  - Airway burns if no immediate life-threat.
  - Burns of face, hands, feet, large joints, perineum, genitalia.
TRAUMA
5.16 OLEORESIN CAPSICUM SPRAY EXPOSURE
September 2008

Usually used by police to subdue an offender by spraying directly into the face (eyes) this is very painful and blinding. Ambulance Officers need to be aware that any direct contact to their skin from remaining residue whilst treating a patient may affect them as well.

Management (eyes)

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Have patient remove contact lens where possible. Flush lens out with sterile saline to protect lens. If urgent flush out with water or saline, but be prepared to throw away lens. Soft lenses which are predominant today cannot tolerate tap water.
- Treat as for chemical burns.

Management (general)

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Irrigate face with copious amount of cold water. When possible use running water and encourage patient to lean forward during treatment. A water bottle spray may be used if running water not available.
- Wash patients face with a low irritant shampoo (if available).
  -Pour 5mls of low irritant shampoo into gloved hands and massage into patient’s face and affected area.
  -Wash shampoo off with cold water.
  -A second application of shampoo may be necessary as eyebrows, beards and moustaches are areas that may cause prolonged contamination.
  -Ongoing decontamination may be required for up to 20 minutes.
  -Irrigate eyes with eye stream, ensuring that the area under the eyelids is well irrigated.
  -To help relieve the burning sensation ice packs may be placed on affected area.
  -Consideration should be given to the presence of hypothermia in colder areas, due to the large amounts of cold water required in the decontamination process.
Specific information needed:

DO NOT BECOME A VICTIM YOURSELF!

This is an extremely dangerous situation and there is a great risk of the rescuer becoming a victim.

Consider all aspects of DANGER!

Ensure power is off at the mains and fuses or circuit breakers removed and in view AT ALL TIMES.

Specific physical findings:
There may be an `entry' and `exit' point for current elsewhere in the body.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Treat cardiac arrest as per CPG Circulation 4.6 Cardiac Arrest.
- Consider differential diagnosis.
- Look for other injuries such as fractures incurred at time of electrocution due to falls or muscle spasms.
- Treat burns as per CPG Trauma 5.15 Burns — transport all electrical burns to hospital as the amount of tissue damage is much greater than the surface burn would suggest (due to internal tracking of the current).
Tension Pneumothorax:

- Consider tension pneumothorax as a potentially treatable cause in traumatic cardiac arrest and asthmatic cardiac arrest.
- Tension pneumothorax requires immediate bilateral decompression by inserting 14 gauge cannula into the 2nd intercostal space along the midclavicular line of the affected hemi thorax, above the 3rd rib at right angles to the chest.
- Attach a 10ml syringe to the end of the cannula, aspirate as the cannula is inserted and observe for air escaping into the syringe.
- Remove the needle and leave the cannula in place.
- Allow any air present to escape, observing the response. Secure cannula in place.
- If no air escapes leave cannula in place and re-evaluate patient.
- If suspected tension pneumothorax re develops repeat procedure
- In the setting of traumatic cardiac arrest the cause is often inadequate volume. Volume (fluid) replacement should be given before, during and after the resolution of tension pneumothorax.
Specific information needed:

- **Symptoms:**
  - Cramping.
  - Clots or tissue.
  - Dizziness.
  - Weakness.
  - Thirst.

- **Present history:**
  - Duration.
  - Amount.
  - If pregnant?

- **Past history.**

Specific physical findings:

- Vital Signs and oxygen saturation.
- Evidence of blood loss and type. Fever? Pain?
- Other signs of hypovolaemic shock — vasoconstriction, sweating, altered consciousness.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Manage circulation as per CPG Circulation 4.5 Shock and CPG Trauma 5.4 Haemorrhage.
- Consider analgesia.
- Monitor Vital Signs and oxygen saturation.
- Suprapubic compression, if indicated.
- **URGENT TRANSPORT IF PREGNANT** – inform receiving hospital by using CPG General 1.9 DeMIST Procedure.

Specific precautions / notes:

- Amount of vaginal bleeding is difficult to estimate.
- Vaginal examination by Officers is never indicated, and is not to be performed.
- The technique of **suprapubic compression** is a means of controlling life-threatening bleeding. This is performed by **deep pressure with the fist** immediately above the symphysis pubis in the midline pressing backward, inward, and slightly upward, to compress the iliac arteries against the forward curve of the lumbar vertebrae. Use only if torrential bleeding cannot be otherwise controlled.
Definition

Pre Term = less than 36 weeks.
Full Term = greater than 36 weeks.

Specific information needed:

- **Brief and relevant** history of current pregnancy:
  - Due date (\(?\) Weeks / gestation).
  - Bleeding (spotting / haemorrhage - ? amount).
  - Problems with pregnancy e.g. raised blood pressure, gestational diabetes, abnormal presentation, multiple birth.
  - Type of antenatal care e.g. regular contact with Doctor / Midwife.

Specific physical findings:

- **Pain:**
  - Location:
    - Contractions? (Note: strength, duration, frequency).
    - Other pain (note: quality / severity).
  - Where privacy is possible, and only if necessary, visually examine perineum.

- **Any bleeding:**
  - Any show (blood stained mucus).
  - Spotting (minimal loss).
  - Haemorrhage (loss greater than 20mls).

- **Ruptured membranes:**
  - Time of rupture.
  - Colour of fluid.

- **Birth imminent:**
  - Urge to push.
  - Crowning
  - Anal pouting
  - Abnormal presentation (foot, arm and/or cord).

- **Maternal vital signs:**
  - Blood pressure and pulse.
  - Signs of pre-eclampsia:
    - Hypertension.
    - Headache.
    - Visual disturbance.
    - Rapid onset of oedema affecting face and hands.
    - RUQ / epigastric / pain.

**Note:** Any of the above may progress to eclamptic seizures.
• Relevant Medical history:
  − Number of prior pregnancies (gravida).
  − Number of prior births (parity).
  − Problems with previous pregnancies (miscarriages, still births).
  − Medical problems.
  − Current medications.

Management (normal child birth):

  • **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
  • Place mother in position of comfort:
    − Not supine — if lying, tip towards left side, support under (R) buttock (avoids weight of uterus pressing on blood vessels, causing drop in blood pressure).
  • Cannula for IV access / fluid infusion if required.
  • Analgesia as indicated (Methoxyflurane):
    **Note:** There is no contraindication to the use of Methoxyflurane in labour it has been used in maternity very effectively over the years. Ensure that it is withheld only if the mother gets too drowsy.
  • If birth imminent follow procedures as per Skill 701 Childbirth.
  • Assess per APGAR.
  • Transport as per mothers / newborns condition. Do not wait for or attempt delivery of placenta. If placenta delivers spontaneously, bring to hospital. **NEVER** pull on the cord.
  • Transport unless delivery in progress. Be prepared to stop ambulance if delivery occurs en route.
  • Advise receiving hospital.

Abnormal Presentations:

  • From time to time there may be an ‘abnormal presentation’. This means that instead of the head, another part may show at the perineum. This may be a hand, arm, foot, leg, or the buttocks (breech).
  • Breech delivery is associated with increased mortality even in professional hands. Refer to CGP Obstetrics and Gynaecological 6.5 Breech Birth.
  • The other abnormal presentations are even more difficult, and may be undeliverable. All require Priority 1 transport to a maternity facility for expert care, and you should make no attempt at delivery, **unless, e.g. breech, it becomes inevitable.**
  • **Prolapsed cord** occurs when part of the umbilical cord is visible at the perineum. This is potentially lethal for the baby due to compression of the cord on the edge of the pelvis. Refer to CPG Obstetrics and Gynaecological 6.3 Cord Presentation / Cord Prolapse.
Management (abnormal child birth):

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Diagnose problem early.
- Monitor vital signs.
- Transport immediately any patient with previous caesarean section, multiple births, abnormal presenting part, excess bleeding.
- **If delivery is inevitable in ambulance refer to** CPG’s Obstetrics and Gynaecological and Skills Manual Child birth, Cord presentation / Cord Prolapse, Shoulder Dystocia or Breech Birth).
- Assess as per APGAR.
- If excessive bleeding occurs post-partum, administer IV fluids, treat for hypovolaemic shock, massage uterus gently, and consider elevation. Supra pubic aortic compression if gross bleeding.
- Transport urgently priority 1.
- Advise receiving hospital.

Specific precautions / notes:

- The fundus should be massaged after all deliveries to prevent excessive bleeding. Presence of the newborn with mother causes uterine contraction expels placenta and controls bleeding.
- It is always safe to assume that any medical or trauma condition will be complicated by pregnancy. Conversely, pregnancy will be complicated by any trauma or medical condition. The abdominal pain complained of by a pregnant woman may not be uterine contractions.
- **Never** pull on umbilical cord.
- Pregnant women who sustain trauma should be transported to an emergency department first, not a maternity hospital.
- If any sudden bleeding occurs during pregnancy or early delivery, **URGENT TRANSPORT IS VITAL** using CPG General 1.9 DeMIST Procedure (the placenta has partially separated, and the baby’s oxygen and glucose supply have been jeopardised; bleeding may also place the mother at risk).

APGAR Score

APGAR as an acronym for: **Activity, Pulse, Grimace, Appearance, and Respiration**.

The APGAR score is assessed once at 1 minute and again at 5 minutes post birth. If the first two scores are low, the test may be scored for a third time at 10 minutes after birth.

A baby who scores a $7 \geq$ on the test at **1 minute** after birth is generally considered in good health.
It's important to keep the baby's APGAR score in perspective. The test was designed to help health care providers assess a newborn's overall physical condition so that they could quickly determine whether the baby needed immediate medical care. It was **not** designed to predict a baby's long-term health.

Keep in mind that a slightly low APGAR score (especially at 1 minute) is normal for some newborns, especially those born after a high-risk pregnancy, e.g. caesarean section, or a complicated labour and delivery. Lower APGAR scores are also seen in premature babies, who usually have less muscle tone than full-term baby's and in many cases, will require extra monitoring and breathing assistance because of their immature lungs.

<table>
<thead>
<tr>
<th>APGAR Score</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Normal colour all over (hands and feet are pink)</td>
<td>Normal colour (but hands and feet bluish)</td>
<td>Bluish-gray or pale all over</td>
</tr>
<tr>
<td>PULSE (Heart rate)</td>
<td>Normal (above 100bpm)</td>
<td>Below 100bpm</td>
<td>Absent (no pulse)</td>
</tr>
<tr>
<td>Grimace (Responsiveness or reflex irritability)</td>
<td>Pulls away, sneezes or coughs with stimulation</td>
<td>Facial movement only (grimace with stimulation)</td>
<td>Absent (no response to touch)</td>
</tr>
<tr>
<td>Activity (Muscle tone)</td>
<td>Active, Spontaneous movement</td>
<td>Arms and legs flexed with little movement</td>
<td>No movement (“floppy” tone)</td>
</tr>
<tr>
<td>Respirations (Rate and effort)</td>
<td>Normal rate and effort, good cry</td>
<td>Slow or irregular breathing, weak cry</td>
<td>Absent (no breathing)</td>
</tr>
</tbody>
</table>
Definition

Cord presentation

- Where the umbilical cord lays in front or along side the presenting part whilst the membranes are intact (Figure 1).

Cord prolapse

- Where the umbilical cord lays in front or along side the presenting part once the membranes have ruptured (Figure 2).

Risk Factors

- High parity (high number of births).
- Preterm delivery.
- Multiple pregnancy.
- Abnormal presentations.
- Premature rupture of membranes.
Specific information needed:

- Gestation (how many weeks).
- Presentation (cephalic, breech).
- Foetal wellbeing (foetal movement).
- Note time of the prolapse (if known).

The time from diagnosis to delivery is critical.

Delays in recognition and management are associated with significant perinatal morbidity and mortality due mainly to complication associated with preterm birth and birth asphyxia. Therefore, cord prolapse required urgent intervention and assistance.

Management

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure**
  - Provide reassurance and explanation to mother.
- Place mother in a knee to chest position or preferably in an exaggerated Simms position (lateral supported with 2 pillows).
- Administer 100% oxygen.
- Consider pain relief (Methoxyflurane).
- Keep cord warm by laying a length of clear film wrap over the cord. **DO NOT TOUCH THE CORD.**
- Coach the woman to pant and breathe through contractions (this helps to avoid pushing).
- If birth is imminent and the mother is actively pushing, deliver the baby as soon as possible.
- Be prepared for neonatal resuscitation.
- Transport priority one.
- Advise receiving hospital.
Management Cord Prolapse

Provide ressurance and an explanation

Place mother in knee to chest position
or
an exaggerated Simms position (lateral supported with 2 pillows)

Administer 100% oxygen

Coach the mother to pant and breathe through contractions
(this helps to avoid pushing).

Keep cord warm by laying a length of clear film wrap over the cord.
DO NOT TOUCH THE CORD

Delivery not imminent

Monitor stage of labour

Transport priority one
Advise receiving hospital

Vaginal delivery imminent

Neonatal resuscitation if required
Definition
Shoulder Dystocia occurs when one shoulder of the baby lodges against the mother's pubic bone (symphysis pubis) and prevents further progress through the birth canal.

The head delivers, but is pulled back tightly against the vaginal opening. The baby cannot breathe because the chest is compressed within the birth canal. As a result, oxygen levels in the baby's blood decreases.

This complication is more common with large babies, particularly when labour has been difficult.

Risk Factors
Mother:
- Increasing maternal age.
- Maternal obesity.
- Maternal birth weight.
- Prolonged pregnancy.
- Short stature.
- Previous history of Shoulder Dystocia.
- Gestational Diabetes.
- Post dates (over due).
- Abnormal pelvic anatomy.

Baby
- Suspected Macrosomia (>4kg).
- Protracted active 1st stage of labour.
- Protracted 2nd stage of labour.
- Anomalies (e.g. Hydrocephalus).
- Co-joined twins.

Clinical Presentation
- Baby's head retracts at the perineum – turtle sign.
- Inability to birth the anterior shoulder despite gentle downwards traction.
Management

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure**
- Reassure mother.
- Provide oxygen – high concentration or 100%.
- Consider pain relief (Methoxyflurane).
- Anticipate possible tearing of the perineum.
- Prepare for neonatal resuscitation.
- Move mother into the Mc Roberts position.
- Coach the woman to pant and breathe through contractions (this helps to avoid pushing).
- During the next contraction apply gently downward traction for 30 seconds in an attempt to deliver the shoulder.
- If no resolution immediately, **without** waiting for contractions, commence Rubin 1 manoeuvre for 30 seconds whilst applying gentle downward traction in an attempt to deliver the impacted shoulder (anterior).
- If no resolution immediately, commence Rocking Rubin manoeuvre for 30 seconds whilst applying gentle downward traction in an attempt to deliver the impacted shoulder (anterior).
- If no resolution roll the mother onto all fours and attempt to deliver the non-impacted shoulder (posterior) which is now the uppermost shoulder.
- Transport priority one.
- Advise receiving hospital.
Definition
The baby lies longitudinally with the buttocks presenting in the lower pole of the uterus (Figure 1).

FIGURE 1

Breech Presentations
Frank Breech (Figure 2)
Buttocks presents first with flexed hips and legs extended on the abdomen.

FIGURE 2

Complete Breech (Figure 3):
Buttocks present first with flexed hips and flexed knees.

FIGURE 3
Footling breech (Figure 4):
One or both feet present as neither hips nor knees are fully flexed. Do not attempt delivery. Transport immediately.

FIGURE 4

Risk Factors
- Prematurity.
- Anomalies (e.g. Hydrocephalus, Anencephalus).
- Multiple pregnancy.
- Death of baby prior to labour.

Delivery of breech should not be attempted in the pre-hospital setting unless it is absolutely inevitable.
Under no circumstances should delivery of a footling be attempted in the pre-hospital setting.

Management (preventative / birth not imminent)
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure**
- Reassure mother
- Provide oxygen – high concentration or 100%.
- Consider pain relief (Methoxyflurane).
- Position mother in the exaggerated Simms.
- Coach the woman to pant and breathe through contractions (this helps to avoid pushing).
- Transport priority one.
- Advise receiving hospital.

Management (imminent delivery / buttock presentation)
- Do not attempt to push foetus back in, minimise handling.
- Prepare for neonatal resuscitation.
HYPOGLYCAEMIA
Specific information needed:

- Onset:
  - Sudden or gradual?
  - When was patient last well?

- History:
  - Of current illness or stress, either emotional or physical.
  - Last meal.
  - Presence / absence of hunger or thirst.

- Past history:
  - Diabetes mellitus.
  - Medic Alert tag.
  - Last insulin (time / amount).
  - Oral hypoglycaemic drugs.
  - Last food intake (related to insulin or tablets).

Specific physical findings:

- Altered conscious state (mental status, confusion, inappropriate words or behaviour. Often aggressive and / or obstructive to treatment).
- Breath odour.
- Blood Sugar Level < 4.0mmol.
- Vital Signs and oxygen saturation.
- Skin; pale, cold, clammy, hydration.
- Sweating, tachycardia (bounding), fits, tremor, seizures.
- `Medic Alert’ or other medical information system?
- Unconsciousness.
- Note: Chronic poorly controlled diabetes may be hypoglycaemic despite BSL >4. Signs of hypoglycaemia are masked by beta blockers.

Management:

- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100%.
- Assess blood sugar level (not essential if known diabetic or condition critical).
- If conscious state allows:
  - Give glucose drink or food. Consider administering Glucose Oral Gel as per instruction on package. Follow up as needed with complex carbohydrates (e.g. sandwich).
If altered consciousness:
- Give IM Glucagon and / or Glucose Oral Gel if indicated.
- If seizure activity is present, consider IM Midazolam.
- If the patient does not improve after 10 minutes or deteriorates, then either administer 10% Glucose intravenous infusion or if no IV access then repeat IM Glucagon (adults only).
- If prolonged generalised seizures, consider IM Midazolam.
- Monitor Vital Signs, oxygen saturations, ECG and BSL
- Administer intravenous fluids as clinically indicated.
- Transport.

Specific precautions / notes:
- Always treat diabetics with altered conscious state as having hypoglycaemia, as well as any other problems (extra sugar won't worsen the hyperglycaemia, and saves the life of the unconscious hypoglycaemic).
- The diabetic will frequently know what is needed — listen to the patient.
- Hypoglycaemia can present as; seizures, coma, behaviour problems, intoxication, confusion, or stroke-like picture with focal deficits (particularly in elderly patients).
- Patients who are elderly or who have been hypoglycaemic for prolonged periods of time may be slower to awaken.

NOTE: COMA IN A DIABETIC

The two main causes of coma are:
- Hypoglycaemia (rapid onset).
- Hyperglycaemia (diabetic keto-acidosis; slow onset — hours or days).
- Remember however, that diabetics can have coma from any other cause.

Causes of Hypoglycaemia:
- Insufficient food intake after normal insulin taken.
- Insulin overdose.
- Heavy exercise without extra food or sugar.
- Nausea or vomiting after insulin or tablets (e.g. seasick diabetic).
- Recent onset of infection.
- Excessive alcohol (usually on an empty stomach) resulting in reduced glucose output from liver.

HYPERGLYCAEMIA

High blood sugar; this condition has a gradual onset and usually develops over 12 — 48 hours. If uncorrected it leads to a variety of serious derangements in the body’s fluid and chemical balance, resulting in dehydration and eventually death.
Causes of Hyperglycaemia:
- Failure to take insulin or insufficient dosage.
- Other disease, often an infection.

History:
Frequently reveals:
- IDDM, NIDDM.
- Recent infection or illness.
- Gradual onset.
- Excessive urine output.
- Failure to monitor blood glucose levels adequately.

Signs and symptoms:
- Gradual onset.
- Fruity breath odour.
- Kussmaul breathing (very deep and rapid).
- Polyuria — frequent urination.
- Polydipsia — excessive thirst.
- Abdominal pain.
- Nausea / vomiting.
- Warm dry skin and sunken eyes.
- Dehydration.
- Weak, rapid pulse (tachycardia).
- BSL usually >16.
- Drowsiness / coma / death.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Give Oxygen – high concentration or 100%.
- Position of comfort or lateral if unconscious.
- Reassurance.
- Monitor Vital Signs, oxygen saturation, ECG and BSL as required.
- Re-hydrate with IV fluids if clinically indicated (e.g. dehydrated).
- Allow conscious patient to self-administer insulin (do not administer it yourself) you may assist a patient with physical / visual impairment.
- **NEVER** assist a drowsy patient to self-administer insulin.
Management of Hypoglycemia
Symptomatic with BSL < 4mmol/l

PRIMARY SURVEY
DRABCD
Assess and correct immediate threats to life

Yes

GCS permits oral intake of carbohydrates?

No

1mg IMI Glucagon or Glucose Gel

GCS 15/15

Yes

Oral sugars/ carbohydrates

No

Recheck BSL. Consider other reasons for altered GCS. Package patient for transport to receiving facility

GCS 15/15

Yes

No

Recheck BSL. Consider other reasons for altered GCS. Package patient for transport to receiving facility

Repeat BSL and monitor patient

Repeat BSL. Monitor patient

Give oral complex carbohydrate if available or Glucose Gel

IV Dextrose 10% 100ml or 1mg IMI glucagon if no IV access

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Review date: January 2010

Page 4 of 4
Specific information needed:

- What happened?
- When did it happen?
- Did the patient have altered consciousness?
- Was there any fitting? (usually follows air embolism).
- Special physical findings:
  - Disconnection of lines.
  - Air in the tubes.
- Seizure or having suffered a stroke-like problem.
- Patient unconscious.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%.
- Monitor Vital Signs and oxygen saturation.
- Immediately remove the patient from the machine by turning off the power at the wall and **clamping both blood lines** about 25 cm from the arm. Then cut the plastic lines between the clamps and the **machine** with a pair of scissors.
- If major blood loss has occurred, consider cannulation and fluid infusion.
- Monitor the ECG and look for abnormal complexes and arrhythmias. Record.
- Treat **seizure** as per CPG Neurological 2.3 Fits and Seizures.
- Suspect venous air embolism by the history of air in the venous return line of the shunt.
- If present, treat with 100% oxygen and position lying down on the side.
- Take care to avoid unnecessary contact with blood as serum hepatitis is common in dialysis patients.
- However, intact skin completely protects against transmission of blood-borne infections.

Critical points for patient record:

- Type of dialysis machine.
- Main problem.
- Other problems.
Specific information needed:
- Sudden collapse or gradual development?
- Exercise induced?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Blood Sugar Level if indicated.
- Temperature 41°C or greater, if it has been assessed e.g. by medical staff.
- Skin hot but dry (usually no sweating).
- Acute psychosis (describe), or seizures on hot, humid day.
- Collapse, shock, vomiting?

Management:
- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100%, if indicated.
- Cool vigorously with water spray, use ice packs, wet sheets and good airflow or fan, (except child febrile convulsions).
- Consider elevation, cannulation and fluid infusion. If IV unattainable and patient is conscious, consider oral rehydration, give clear fluids — little and often.
- Glucagon / Glucose Oral Gel if indicated. If trained and authorised.
- Monitor cardiac rhythm.
- Monitor Vital Signs and oxygen saturation.

Specific precautions / notes:
- Heat **stroke** is a medical emergency. Differentiate from heat **cramps** (abdominal or leg) or heat exhaustion, but be aware that **heat exhaustion can progress to heat stroke**.
- Wet sheets over patient without good airflow will tend to increase temperature.
- Definitive cooling will need an ice water bath.
- **DO NOT LET COOLING IN THE FIELD DELAY YOUR TRANSPORT.** Cool patient if possible while en route.
Specific information needed:
- Length of exposure?
- Loss of consciousness?
- Was the patient wet?
- Any drugs including alcohol?

Specific physical findings:
- Vital Signs, mental status.
- Temperature. Note temperature of environment where found.
- Evidence of local injury.
- Blood Sugar Level – if indicated.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- CPR as necessary – may require prolonged CPR
- **Oxygen**, high concentration or 100%.
- Glucagon / Glucose Oral Gel – if indicated. If trained and authorised.
- If IV in place, administer IV fluid if shocked, otherwise keep vein open.
- Re-warming to be started if possible.
- Remove wet and cold clothing.
- Bundle in blankets.
- Monitor cardiac rhythm. If non-perfusing rhythm, carry out CPR, and defibrillate according to Clinical Practice Guidelines, if trained and authorised.
- Monitor Vital Signs and oxygen saturation.

Specific precautions / notes:

**General Hypothermia:**
- Shivering occurs when the body temperature is between 32 – 37°C, but not below.
- The heart is likely to **fibrillate** between 29 – 31°C. It may not be possible to successfully defibrillate until the patient's temperature is above 31°C and acidosis is corrected by effective ventilation.
- Realise that most thermometers (except veterinary types) do not register below 35°C.
- Hypothermia may be a sign of hypoglycaemia.
- Avoid stimulating the airway unnecessarily, e.g. by suction. This may produce ventricular fibrillation in the hypothermic patient!

**Local Hypothermia:**
- Thawing of frostbite should be done as soon as possible.
- Immerse in warm water to thaw as quickly as possible. Temperature of water is not critical, but must be comfortably tolerated by the patient. The water can be tested by one's own hand.

This Clinical Practice Guideline was written to assist those instances of hypothermic injury involving long evacuation and transport time.
ENVIRONMENTAL
8.3 IMMERSION / NEAR DROWNING
November 2005

Specific information needed:
- How long patient was immersed? Any resuscitation?
- Diving accident? (SCUBA or headfirst entry into shallow water?)
- Associated factors — alcohol, AMI, epilepsy, drug O/D, suicide?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Neurological status; monitor on a continuing basis.
- Signs of Pulmonary Oedema, respiratory distress.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Clear upper airway.
- **Oxygen**, high concentration or 100%.
- Ventilate as needed — may need positive pressure ventilation.
- Stabilise neck prior to removing from water if any suggestion of neck injury, and in all unconscious shallow water victims.
- Do not attempt to drain fluid from lungs — you cannot, and there is minimal extra fluid in the lungs.
- Consider elevation, cannulation and fluid infusion.

Specific precautions / notes:
- Be prepared for vomiting, especially during recovery.
- All near drowning or submersions should be transported. Even if patients initially appear fine, they can deteriorate. Monitor closely. Pulmonary Oedema is possible as a follow up event caused by lung contamination.
- Beware of neck injuries—they often go unrecognised.
- Remember hypothermia, especially in children, extraordinary recoveries have happened, but rarely.
These include:
- Arterial Gas Embolism.
- Decompression Sickness (the bends).
- Pulmonary barotrauma with pneumothorax.

Specific information needed:
- Time of problem.
- Circumstances.
- Dive history — depth, duration, other dives, ascent, time of onset of problem.
- Better or worse since problem onset? Flying after diving?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Physical problems e.g. pain, weakness, numbness, paraesthesia.
- Mental state.
- Neurological assessment.
- Subcutaneous emphysema?

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **100% Oxygen** administration vital, early, continuous, MUST be 100%. (Nitrogen-free breathing gas is the need, as well as Oxygen for injured tissues).
- Look for evidence of **pneumothorax**, e.g. dyspnoea with asymmetric chest movement (infrequent finding).
- If arterial gas embolism is suspected, lie patient down horizontally, on side if unconscious.
- Monitor Vital Signs, oxygen saturation and ECG.
- Transport.
- Consider elevation, cannulation and fluid infusion.

Transfer to **Fremantle Hospital Emergency Department** if time critical. **Do not** go direct to Hyperbaric Chamber without instructions. **It may be all locked up!**

If urgent attention is required, take to the nearest Emergency Department first.
Specific precautions / notes:

- **Warning**: administration of "Entonox" (Nitrous Oxide / Oxygen 50/50) will cause any bubbles of gas in the body to **expand**.
- Any case of decompression sickness may develop serious neurological problems.
- **Recent Air Embolism** patients should remain lying down until they reach a hyperbaric chamber, unless they have already been upright without problems, in which case, position of comfort.

Salt Water Aspiration Syndrome:

- This is rarely an emergency.
- The diver, about a couple of hours after a dive, develops pain in the chest and dyspnoea, with aches and pains all over, and sometimes aches in all joints.
- They often shiver, and feel 'as if flu is coming on'.
- The condition is caused by inhalation of a fine mist of seawater, usually from a defective regulator, and is self-limiting. Oxygen may help. It subsides by that evening or the next day.
Specific information needed: Note on patient record:
- Type of hazard.
- Radioisotopes involved.
- Irradiation from solid sources.
- Industrial and laboratory waste.
- Duration of exposure.
- Type of contamination.

Specific physical findings:
- None peculiar to irradiation in the acute phase.
- All normal care as for any casualty.

Management:
- **Danger** (assess likely level of risk).
- Gather HAZCHEM information, advise Communications Centre then take direction from the Hazard Management Agency or Combat Agency.
- If the patient has not been adequately decontaminated or decontamination cannot be assured, then put on appropriate protective equipment as soon as practical.
- **Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Treat presenting medical problems.
- If possible, remove the patient and all other people involved, injured or not from the source of contamination. If required, follow decontamination instructions from the Hazard Management Agency or Combat Agency.
- Instruct patients, especially if not seriously injured, not to leave the scene until experienced specialists have tested them with monitors to ascertain whether or not they have been contaminated.
- Put a **sheet on the stretcher and wrap the patient**. This will minimise spread of contamination to attendants, ambulance and later on, in the hospital. Patient is of course unwrapped if continuing medical care is needed.
- If possible advise Hospital of nature of incident prior to arrival. Following handover to hospital staff, assist at their direction.
Specific precautions / notes:

- The irradiated patient is no hazard to the attendants unless loose contaminants remain on the external surfaces (similar to the burned patient).
- Contamination is never a medical emergency. Even with spill of a vanload of medical isotopes, significant medical hazard is almost inconceivable. The extent of radiation from an uncontrolled source cannot be guaranteed until measured by Radiation Health or the Chem. Centre.
- The most common radiation incident arises from the daily transportation of numerous radioactive industrial and medical materials.
- Accidents may cause mechanical damage to containers, and there may be physically injured patients.
- Handling of radiation accidents must be demystified. The Officer need never hesitate to give medical attention to victims, due to the "radioactive material" sign displayed on the vehicles. Simple basic rules apply.
- The Officer is protected from the radiation source by distance, a reduction of exposure time, and shielding.
- Surface contaminations are not life threatening, and no patient has ever died from secondary exposure to surface contamination. For the Officer it is a nuisance, which needs special precautions essentially to prevent the spread of contamination to attendants, ambulance, hospital emergency facilities, etc.

At the scene:

- Gather HAZCHEM information, advise Communications Centre then take direction from the Hazard Management Agency or Combat Agency.
- If a vehicle displays the radioactive HAZCHEM sign, the Officer must assume that some form of radiation is present.
- Officers should try not to spread the contamination unnecessarily i.e. into ambulances, hospitals or to other workers and to follow instructions from their Supervisors or the Hazard Management Agency or Combat Agency.
- **Washing** removes contamination.

At the Hospital:

- If possible give hospital prior warning of arrival and details of incident.
- Assist hospital staff to follow their procedures for the handling the patient.
- This may include:
  - Place sheet on floor, place stretcher on sheet, unwrap the patient, cut off patient's clothing avoiding shaking the material and distributing contaminated material more than necessary.
  - Leave patient’s clothing and the stretcher. This will remove at least 90% of the radioactive material in the case of surface contamination.
  - Emergency Department Staff will be gowned and gloved. They will lift patient onto a clean stretcher or decontamination tabletop where they will be further decontaminated by soap and water washing. Nail, hair and skin samples are taken for radioactivity dose measurement.
- Officers may now need to remove their outer clothing if so instructed by a Radiation Officer, and place either in a plastic bag or with stretcher and clothing. Stretcher, patient’s clothes, and any other possibly contaminated clothes are carefully wrapped.
- Officer and others wash with soap and water, face first, then hands, and discard washcloths.
- Await monitor check for any residual radiation.

- **Decontamination of the Officer and equipment** depends on the type of hazard encountered. Decontamination remains the responsibility of the Hazard Management Agency or Combat Agency. It may not be possible for Officers who have been contaminated to leave the scene. Patients may have to be handed to non-affected Officers and vehicles.

- The removal of the CBR PPE should be supervised and the contaminated suit bagged as per correct disposal methods. The respirator should be bagged and kept separate, as these will be cleaned. Please follow the Information Sheet provided with the CBR PPE and Standing Operational Policies regarding these matters.

- **Decontamination of the ambulance and equipment** should be carried out at the direction of the Hazard Management Agency. In the absence of clear instruction, the vehicle should be cleaned internally and externally with water and detergent.

- **Note:**
  
  Radiation hazard to emergency professionals is extremely small. Basic common-sense precautions are used. Chances of an Officer sustaining significant radiation are virtually nil. Precautions are to avoid prolonged contact of material with skin, which could, over a long time, produce a significant dose.
Specific information needed:

- **History:**
  - Known allergies.
  - Prior allergic reactions.
  - Check ‘Medic Alert’ Bracelet or similar.

- **Exposure (surface, orally, IM or IV):**
  - During past few hours to allergenic substances.
  - Drugs, antibiotics allergy.
  - Infections, insect bites.
  - Toxic substances.
  - Unusual foods (nuts, fish and fruit most common).

- **Symptoms:**
  - Itching.
  - Blotchy rash.
  - "Hives" (blobby swelling).
  - Difficulty breathing.
  - Chest tightness.
  - Nausea.
  - Abdominal cramps.
  - Subjective airway impairment (dyspnoea) or swelling, numbness and tingling.

Specific physical findings:

- Vital Signs, level of consciousness and oxygen saturation.
- Respiratory; wheezing, hoarseness, and upper airway noises.
- Difficulty talking, speaks in sentences or saying words (serious).
- Skin; generalised itching or flushing, rash, hives.
- Oedema; generalised or local, particularly of lips, tongue, uvula, face.
- Abdominal pain, vomiting or diarrhoea.
- Pale and floppy (young).
- Altered conscious state and or collapse.
**Management:**

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Consider the need for advanced airway management (e.g. ETT, cricothyrotomy).
- Oxygen, high concentration or 100% (ventilate if necessary).
- Monitor Vital Signs and oxygen saturation.
- Remove injection mechanism if still present e.g. stings.
- Patient should be supine with legs elevated unless respiratory distress predominates.
- If signs and symptoms of anaphylaxis are present, administer **IM adrenaline** (preferably lateral thigh). As per CPG Medication 11.5 Adrenaline.
- If wheeze is present administer **Salbutamol** as per CPG Medication 11.32 Salbutamol Sulphate (Ventolin).
- **Repeat adrenaline** every 5 – 10 minutes (adults) as clinically required.
- In children the dose of adrenaline may be repeated once only after 10 minutes if clinically required.
- Cannulate patients with anaphylaxis (except children). Consider intravenous fluid infusion at KVO. If the patient is in anaphylactic shock administer crystalloid infusion rapidly and reassess as per CPG Medication 11.19 IV Crystalloid Solutions
- Monitor Vital Signs, oxygen saturation and cardiac rhythm.
- Consider elevation, cannulation and fluid infusion.
- Monitor cardiac rhythm.
- If patient time critical, advise hospital using CPG General 1.9 DeMIST procedure.

**Specific precautions / notes:**

- Adrenaline may produce a tachycardia, anxiety, tremor, palpitations, and headache. These may be severe, however it may be life saving.
- Antihistamine drugs may be given by injection by a doctor — these are slower acting and may produce sleepiness.
- Potentially lethal oedema may be localised to the tongue, uvula, or other parts of the upper airway.
- Examine closely, but **DO NOT** place anything within the mouth as this may precipitate acute obstruction.
- Position appropriately with dependent drainage for secretions — this is usually on the **side**, or sometimes in the **sitting** position for the conscious patient.
- Be prepared for **Cricothyrotomy** if patient’s airway totally obstructs.
Specific information needed:

- **Type of ingestion:**
  - What, when and how much was ingested?
  - Bring the poison, the container, sample of emesis, and anything relevant in the area with the patient to the emergency department.

- **Reason for ingestion:**
  - Tactfully screen for suicidal problems, domestic or relational problems.

- **Relevant past history:**
  - Medications.
  - Diseases.

- **Action taken by bystanders:**
  - Induced emesis? "Antidote" given?

Specific physical findings:

- Vital Signs and oxygen saturation.
- Level of consciousness.
- Breath odour.
- Neurological status.
- Vomitus.
- Substance abuse evidence.

Management:

- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**

- **External contamination:**
  - Protect medical personnel.
  - Remove contaminated clothing.
  - Flush contaminated skin and eyes with copious amounts of water.

- **Internal Ingestion:**
  - When in doubt — call for advice from Poisons Information Centre.
  - **Do not induce vomiting or administer charcoal or ipecacuanha — No longer recommended.**
  - Do not try to neutralise alkalis with acids.
  - Do not try to neutralise acids with alkalis.
  - Within first 10 minutes of ingestion of corrosives or acids it is permissible to try to give 100ml of water in slow sips if patient can tolerate this, to dilute the substance (after this there may be penetrating ulcers or burns).
If patient is poorly responsive or has depressed respirations:
- Assess danger, response and support ABCs.
- **Oxygen**, high concentration or 100% ventilate if necessary.

If shocked consider elevation, cannulation and fluid infusion.
Ventilate patient if respiratory depression requires this.
Transport in lateral position if indicated.
Monitor Vital Signs and oxygen saturation.
Monitor cardiac rhythm. Arrhythmias likely if antidepressant drugs ingested.

**Specific precautions / notes:**

- There are few specific "antidotes", and only relevant if long or delayed transport. It is permissible to follow the instructions on the poisons container, but follow up with Poisons Information Centre. If the information conflicts — Poisons Information Centre's management takes priority. Watch the A.B.C., these are important.
- Inhalation poisoning is potentially dangerous to rescuers. Recognise an environment with continuing contamination and extricate rapidly from a toxic atmosphere.

**Narcotic Overdose**

- If narcotic overdose is suspected, initial and preferred management is by maintaining a clear airway, providing 100% Oxygen, and ventilation as necessary. This is usually all that is needed. Many such patients will breathe effectively, and may awaken in a minute or two with this only.
- Naloxone administration may result in an aggressive and / or transport-refusing patient. Naloxone IM should be reserved for:
  - Patients who are difficult to ventilate or maintain an airway.
  - Multiple patient situations, to facilitate management.
  - Difficult extrication or transport situations.
- Many overdose patients are poly-drug users. Patients using narcotics often take other drugs in conjunction with the narcotic. These are some of the easiest patients to ventilate, and do not necessarily need Priority 1 transport. Patient condition and ease of control dictates professional decision on transport priority.

**Tricyclic (antidepressant) overdose:**

- Risk of arrhythmias.
- Can die suddenly.
- **URGENT** transport.
Specific information needed:
- What happened, when, how?
- Note: description of creature involved for identification? (Don’t become victim, avoid trying to trap or catch).
- Initial symptoms?
- What happened since?
- Bystander information?

Specific physical findings:
- Vital Signs and oxygen saturation.
- Evidence of bite.
- Local effect.
- Distant effects — general signs and symptoms. e.g. salivation, numbness around mouth / elsewhere, weakness, dizziness, etc.
- Adults — life threatening effects may develop within minutes but may also take several hours.

Caution:
- Children may show life threatening effects within minutes.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Oxygen, high concentration 100% (ventilate if necessary).
- See also CPG Anaphylaxis – Acute Allergy 9.1 Anaphylaxis.
- Pressure immobilisation bandage is recommended for:
  - All Australian snakes including sea snakes.
  - Funnel web spider.
  - Blue-ringed octopus.
  - Cone shell.
  - Bee, wasp and ant stings in allergic individuals.
- **Splint** the limb to minimise muscle movement.
- Monitor Vital Signs, ECG and oxygen saturation.
- If shocked consider elevation, cannulation and fluid infusion.
- Watch closely for signs of respiratory depression necessitating ventilation.
- Transport rapidly to hospital as the patient may require urgent administration of antivenene.
Specific precautions / notes:
- Pressure immobilisation bandage is not recommended (venom acts slowly and any attempt to retard its movement tends to increase local pain) for:
  - Other spider bites including red back.
  - Jelly fish sting.
  - Fish stings including stone fish.
  - Bites or stings by scorpions, centipedes or beetles.

Application of a pressure immobilisation bandage:
- Apply a dressing over the bite site/s (to localise the bite area).
- Use a firm wide bandage (to stop lymphatic spread of venom). Bandage from fingers or toes up the limb to the armpit or groin. Apply pressure as for strapping a sprained ankle.
- Splint the limb (immobilisation).
- Check distal arterial pulses are preserved.
- Do not remove.
- Research has shown very little venom reaches the circulation, even after several hours if the pressure immobilisation bandage is applied and maintained.

SPECIFIC TREATMENTS

Snake Bite:
- Rest and reassure the patient.
- Keep under constant supervision.
- Restrict patient movement (to decrease lymphatic flow), carry patient if possible.
- If bitten on limb do not elevate.
- Do not cut or incise the bite.
- Do not use an arterial tourniquet.
- Do not wash or suck the bite.

Red Back Spider, Bee, Wasp and Ant stings:
- Rest and reassure the patient.
- Analgesia as indicated.
- Apply cold compress over the bite area to relieve pain. Do not freeze or damage the unprotected skin.
- Scrape Bee / Wasp sting off sideways with finger nail or sharp edge. The sac must not be squeezed or pulled because this will inject more venom.
Ticks:

- Very common, can take up to 3 to 5 hours for attachment.
- Ticks may be removed by use of common household products that smother the tick causing them to retreat. Such chemicals as vasoline, baby oil, suntan oils, Vaseline intensive care lotion and even toothpaste or an insect spray may help.

**IF NOT**

- Remove tick(s) using fine tipped curved forceps or equivalent, press skin down on the front part (mouth parts) of the tick then close the points and lift / lever the tick out intact.
- Do not grasp the ticks body as this may result in incomplete removal as well as expression of toxin.
- Apply an antiseptic, consult medical advice if required.
- Antivenom is available for Australian Paralysis Tick envenomation.
- Infection from ticks can be serious depending on tick source e.g. rats carrying Typhus.

**JELLYFISH (tropical)**

Tropical area is classed from Geraldton around the northern coastline to Bundaberg, Queensland. The Box Jellyfish and Irukandji jellyfish are both tropical species and are considered potentially fatal.

**Box Jellyfish (tropical):**

- Estuarine and coastal animal which produces whip like stings with severe immediate skin pain.
- Large stings have caused cardiac arrest within minutes.

**Irukandji Jellyfish (tropical):**

- On and offshore jellyfish.
- Produces minor stings on skin followed in 5-40 minutes (typically 20-30) by severe pain and / or cramping, nausea, vomiting, SOB, sweating, restlessness and feeling of impending doom.
- Victims may develop heart failure, Pulmonary Oedema and hypertensive stroke.

**Special notes:**

- Children are more at risk because of body size.
- In areas where dangerous tropical jellyfish are prevalent and the jellyfish cannot be clearly identified as harmless, it is safer to treat with vinegar.
- The role of vinegar is to inactivate discharge of nematocysts (stinging capsules) in all known cubozoans (e.g. box jellyfish). Vinegar will cause discharge in some other jellyfish stings and is therefore primarily recommended in tropical areas where fatal stings occur.
- Fresh water applied to a jellyfish sting once the skin has dried may cause the undischarged nematocysts present to fire, yet the extreme temperatures of water (hot or ice) can give pain relief.
- Pressure immobilised bandage is not recommended for jellyfish stings.
- Rescuers; a full body suit such as a lycra suit or equivalent provides a good measure of protection against marine stings.

Management of tropical Jellyfish stings:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Remove patient from water and restrain if necessary.
- Commence resuscitation as necessary.
- Give Oxygen if available.
- Liberally douse the stung area with vinegar to neutralise stinging cells.
- If vinegar is unavailable, pick off remaining tentacles and rinse well with seawater, (not freshwater).
- Transport urgently.

JELLYFISH (non tropical)

Management non tropical jellyfish and blue bottle stings:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- Give Oxygen if available.
- Keep patient at rest, reassure and keep under constant observation.
- Pick off adherent tentacles with fingers.
- Douse affected area with seawater to remove unseen stinging cells (Do not wash with fresh water). DO NOT RUB the stung area.
- For pain relief: **Major stings**, place stung area in hot water (no hotter than the officer can tolerate) or extended hot water shower. If pain is unrelieved by heat, or hot water is not available apply cold packs (or wrapped ice to the area).
- For pain relief **Minor stings**, apply cold packs or wrapped ice.
- If local pain is unrelieved or the stung area is large (half a limb or more), transport urgently.

Stone Fish and Cobbler or similar:
- Immerse stung area in hot water for at least 20 minutes. Check temperature of water to avoid scalding by using unaffected limb to judge the patient's ability to withstand the water temperature.
- Fish venom is unstable in high temperatures. The aim is to inactivate venom. Heat increases blood flow, dispersing the venom.

Blue Ringed Octopus bite or Cone Shell sting:
- Ventilate if victim is becoming paralysed, or having increasing breathing difficulty.
Specific information needed:
- Is there still danger?
- What happened?
- What gas / vapour / agent involved?

Specific physical findings:
- Consciousness.
- Cyanosis.

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- If there is any suspicion of danger seek further expert advice: i.e Fire and Rescue, if on site contact mine site rescue before entering.
- Immediately it is safe to do so, quickly remove the patient from the environment.
- Beware of self-asphyxiation. (Some gases are colourless, tasteless and odourless).
- May need the assistance of the Fire and Emergency Service with breathing equipment, etc.
- **Oxygen**, high concentration or 100% to clear the noxious gas.
- Monitor Vital Signs.
- If there are signs of skin irritation, shower for 20 minutes and / or continue irrigation en route.
- Collect clothing and place in contamination waste bag and seal (may be needed for identification purposes).
- **Salbutamol** if wheeze present as per CPG Medication 11.32 Salbutamol Sulphate (Ventolin).
- Main complication is acute Pulmonary Oedema. The onset may be delayed by some hours so always transport to hospital for observation.
- Advise hospital as per CPG General 1.9 DeMIST.

Specific precautions / notes:
- Use HAZCHEM system.
- Refer to Material Safety Data Sheet for specific instructions.
- Contact Poison Information centre if required.
- No place for dead heroes.
Specific information needed:
- Circumstances.
- Duration of exposure.
- Vomiting or fitting.
- History of loss of consciousness.

Specific physical findings:
- Vital Signs and oxygen saturation.
- The cherry pink skin colour is rare, and usually after death!

Management:
- **Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.**
- **Oxygen**, high concentration or 100%, ventilate if necessary.
- Monitor Vital Signs.
- **Note**: oxygen saturation monitoring. Carbon monoxide poisoning produces abnormal haemoglobins which causes readings to be inaccurate.
- Monitor rhythm by ECG or pulse.
- Transport.

Specific precautions / notes:
- Decision will be made at nearest Emergency Department regarding the need for emergency hyperbaric Oxygen therapy. **Unconsciousness** or significantly altered consciousness at any time, is main indication, or changes in behaviour, neurological, or mental status.
- May have delayed mental changes.
Clinical Practice Guidelines for Critical Care Paramedics in Western Australia

Preamble:

- St John Ambulance provides Critical Care Paramedics to crew the Emergency Helicopter Rescue Service, providing a primary response for medical emergencies and trauma to approximately a 200 kilometre radius of the Perth Metropolitan area. Paramedics can also assist in secondary responses for retrieval and transfer of patients to tertiary hospitals.

- These Clinical Practice Guidelines are available for use when working for St John Ambulance as a Critical Care Paramedic whilst rostered as crew to the Emergency Helicopter Rescue Service, and have been trained, and currently authorised to use them by St John Ambulance.

- Officers under these circumstances may use both ‘Clinical Practice Guidelines for Ambulance Care in Western Australia’, and ‘Clinical Practice Guidelines for Critical Care Paramedics in Western Australia’, to the extent that they are trained and currently authorised.
Critical Care Paramedic Initiated Intervention

CCP Guideline 1 - Chest Injuries
CCP Guideline 2 - Continuous recurrent Seizures
CCP Guideline 3 - Hypoglycaemia
CCP Guideline 4 - ECG (5 and 12 lead)
CCP Guideline 5 - (Part A) - Bradycardia
CCP Guideline 8 - RSI for Intubation Head Injury Adult
CCP Guideline 9 - Intraosseous infusion

Medications

IV Atropine Sulphate
IV Dextrose 5%
IV Dextrose 50%
IV Haloperido
IV / IM Metoclopramide
IV Midazolam
IV Morphine / Midazolam Infusion
IV Rocuronium Bromide
IV Suxamethonium
Chest Injuries

- If pneumothorax suspected, avoid coughing, Valsalva manoeuvre, and IPPV. If IPPV cannot be avoided, anticipate that IPPV may result in tension pneumothorax necessitating decompression. Transport without delay.
- Re-assess initial management, manage other problems accordingly, and transport the patient without undue delay.

Tension Pneumothorax

- If the patient shows signs of tension pneumothorax and is deteriorating with decreasing conscious state and poor perfusion, then attempt immediate chest decompression, by inserting a 50mm (2 inch) 14 gauge cannula into the 2nd intercostal space with a 20ml syringe attached, just medial to the mid-clavicular line, above the 3rd rib, at right angles to the chest wall, aimed slightly towards the body of the vertebra. Another site, if appropriate, is the anterior axilla.
- Allow any air present to escape, observing the response if possible. When air ceases to escape, remove the needle, secure the cannula in place and attach a Heimlich Valve or alternative one-way valve system.
- If no air escapes, remove the cannula, mark with a pen and cover the insertion site with a clear adhesive dressing. Transport without undue delay.
- If no air escapes, but copious blood flows through the cannula then a major haemothorax is likely. Cap and secure the cannula. Transport without undue delay. Notify the receiving hospital.
- If suspected tension pneumothorax redevelops following removal or capping of cannula, repeat procedure.
- Observe and note the response if possible.
- If patient remains with inadequate or extremely poor perfusion, consider other causes.
Continuous / Recurrent Seizures

- The first line of pharmacological management by Critical Care Paramedics for the patient presenting with continuous / recurrent seizures is the administration of IM Midazolam as per the standard CPG Medication 11.25 Midazolam with an adjunct of using IV MIDAZOLAM CPG Medication 11.26 Intravenous Midazolam (Hypnovel) particularly if IV access already established.
- Intravenous Midazolam.
- Initial dose: Midazolam 2.5 – 5mg IV slowly.
- If necessary, increments of Midazolam 2.5-5mg boluses titrated to effect every 2-5 minutes to maximum 20mg.

At all times:
- Maintain general care of unconscious patient.
- Ensure adequate airway and ventilation.
- Consider other causes e.g. Hypoglycaemia.
- In the event that Midazolam has already been administered to the patient, this must be accounted for when applying further doses.
ECG Leads 5 and 12 Using Zoll M Series

Preparing to monitor with 12 leads:

Preparing patient:
- Remove all clothing covering the patient’s chest.
- Clean and dry the patient’s skin.
- Clip excessive chest hair with scissors.
- Clean oily skin with alcohol swab.
- Briskly rub to dry and remove dead skin.

Attaching leads:
- Locate limb lead junction box in middle of ECG monitoring cable.
- Remove protective cap from the connector labelled V1-V6.
- Place end of V lead cable into connector.

Before applying ECG leads select V1 site:
- Place your finger on top of the jugular notch.
- Move your finger slowly down about 3.8cm (1.5 inches) until you feel a slight horizontal ridge.
- This location, known as the angle of Louis, is where the manubrium joins the sternum.
- Locate the second intercostal space on the right side lateral to and just below the angle of Louis.
- Move your finger down two more intercostal spaces to the fourth intercostal space.
- This location is the proper application site for the V1 lead.
- After you have located the V1 lead site, select the remaining application sites using figures 1, 2, 3 and 4.
- If the patient is shivering and arm placement not viable then place on torso as in figure 3.
FIGURE 1

Jugular notch

Angle of Louis

1  2  3  4  5  6

FIGURE 2

RA

LA

RL

LL

FIGURE 3

RA/R

LA/L

RL/N

LL/F

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FIGURE 4.

<table>
<thead>
<tr>
<th>AHA Labels</th>
<th>IEC Labels</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA (white)</td>
<td>R (red)</td>
<td>Right arm</td>
</tr>
<tr>
<td>LA (black)</td>
<td>L (yellow)</td>
<td>Left arm</td>
</tr>
<tr>
<td>RL (green)</td>
<td>N (black)</td>
<td>Right leg</td>
</tr>
<tr>
<td>LL (red)</td>
<td>F (green)</td>
<td>Left leg</td>
</tr>
<tr>
<td>V1</td>
<td>C1 red</td>
<td>As above</td>
</tr>
<tr>
<td>V2</td>
<td>C2 yellow</td>
<td>Fourth intercostal space, on left midclavicular line.*</td>
</tr>
<tr>
<td>V3</td>
<td>C3 green</td>
<td>Fifth rib, between leads V2 and V4.*</td>
</tr>
<tr>
<td>V4</td>
<td>C4 brown</td>
<td>Fifth intercostal space, on the left midclavicular line.*</td>
</tr>
<tr>
<td>V5</td>
<td>C5 black</td>
<td>Left anterior axillary line, at the horizontal level of V4.*</td>
</tr>
<tr>
<td>V6</td>
<td>C6 purple</td>
<td>Left midaxillary line, at the horizontal level of V4.*</td>
</tr>
</tbody>
</table>

* For female lead placement of V1, V2, V3, V4, V5 and V6 place electrode under the breast rather than on the breast.

Displaying the 12 lead menu:
- Turn the selector switch to monitor.
- Press the lead button to display any lead except pads.
- Press the 12 softkey.
Bradycardia

Adequate or borderline perfusion:
- Maintain initial management and transport, no specific treatment is required.
- Inadequate or extremely poor perfusion:
  - Administer Atropine 0.6mg IV.
  - Repeat dose every 1-5 minutes as necessary to a maximum of 3mg.

No increase in heart rate:
- The patient is likely to require pacing. Prepare and begin transcutaneous pacing process.
- Note: Atropine is unlikely to be effective in complete heart block, with broad QRS complex.
Synchronised Cardioversion

Indications:

- Decide as per Clinical Practice Guidelines on use of cardioversion.
- A patient with tachycardia and haemodynamic instability (chest pain, Pulmonary Oedema, light headed or hypotensive) should be immediately cardioverted.
- Cardioversion may be used to treat stable VT that does not respond to medications. In haemodynamically stable patients, cardioversion is also used to electively restore rhythm in atrial arrhythmias.
- **Atrial Fibrillation**: Stable patients should have their ventricular rate controlled, and most should be anticoagulated with intravenous Heparin and started on Warfarin for prevention because of a high risk of thromboembolism. If the atrial fibrillation is less than 48 hours old and the patient is unstable, cardioversion is performed without prophylactic anticoagulation.

Preparation:

- Intravenous access.
- Airway management equipment.
- Sedative drugs if required as per CPGs.
- Defibrillator.
- **Note**: Short acting sedatives drugs are preferred e.g. Midazolam.
  A patient with known or suspected digoxin toxicity may develop resistant arrhythmias and should not be cardioverted.
- Pad positions are the same as for emergency defibrillation. Energy requirements vary on the type and cause of arrhythmia. Usually, atrial fibrillation requires 100J and increase to 150J if attempt fails for subsequent shocks (Biphasic).
- Complications; are the same as for emergency defibrillation. If the patient goes into VF post cardioversion, turn the synchronise button off and proceed with ALS measures.
Synchronized Cardioversion:

- Press the sync On / Off softkey.
- Verify that the arrow display over every R-wave and SYNC message displays (note: SYNC 200J SEL is incorrect in graphic below).

- Warn all persons to stand clear prior to defibrillation. Check all clear.
- Press and hold the illuminated, front panel shock button until energy is delivered to the patient. The defibrillator will discharge with the next detected R-wave.
- Once the energy is delivered, the display will simultaneously show “XXXJ DELIVERED” and “DEFIB XXXJ SEL”. After about 5 minutes the “XXXJ DELIVERED” message will disappear and the “DEFIB XXXJ SEL” message remains to select the selected energy level.
- If additional counter shocks are necessary, readjust the energy level as necessary, press the SYNC soft key and repeat. Note: “SYNC XXXJSEL” must be displayed prior to pressing the charge button.
- The ANALYSE function is disabled whilst in SYNC mode. Turn off SYNC if analyse function is required.
- If the unit is not discharged within 60 seconds the unit will disarm its self. The unit can be disarmed manually by turning selector switch to monitor or change the energy level.
Non-invasive Pacing Using Zoll M Series Defibrillator

Follow Clinical Practice Guidelines for Non-invasive Pacing.

Indications:

- Sinus bradycardia.
- AV blocks.
- Idioventricular rhythm.

Prepare patient:

- Remove clothing from chest and dry if necessary.
- Attach ECG leads:
  - Apply ECG leads and electrodes and adjust ECG size and lead for a convenient waveform to display an R wave. Verify a proper R wave detection. The heart shape symbol flashes with each R wave when proper detection is taking place.
  - Attach MFE pads Anterior and posterior positions:
    - Anterior: Place pad left midclavicular line and fourth intercostal space. Avoid nipple.
    - Posterior: Pace pad under the left scapula next to the spine.
    - If unable to place anterior or posterior then revert to normal defibrillation positions.
    - Note: MFE pads should be replaced after 8 hours (2 hours if using radiolucent stat-padz).

Demand pacing:

- Demand pacing using the M series Monitor Defibrillator. The unit monitors the patient heart rate via the ECG cable and delivers selected energy level only when the patient’s intrinsic rate falls below the set pacer rate. If the rate does not fall below this rate the pacer will not send a stimulus.
- Turn selector switch to PACER. Display as per figure 1.
- Turn the **PACER RATE** knob clockwise until screen displays the desired pacing rate. Variable rate from 30-180 pulse per minute (ppm).
- Verify that pacing markers display on the **ECG** trace.
- Turn the **PACER OUTPUT** (milliamps) knob clockwise slowly until ventricular capture is consistently achieved. Generally the amount of current varies widely however the range is normally between 50-90mA. The maximum current on the external pacer is 140mA.
- Increase pacer output until symptoms resolve or rate of 100ppm is reached.
- **Note**: when the unit is switched out of Pacer mode into defib or monitor modes and back again the pacer settings will remain unchanged. If the unit is turned off for more than ten seconds the pacer default settings will be restored.
- Check for electrical capture by the presence of a pacing spike followed by a widened QRS complex (response to the stimuli), the loss of any underlying intrinsic rhythm, and the appearance of an extended, and sometimes enlarged T wave.
- Check for **mechanical capture** by taking a pulse on the femoral, brachial or radial artery. Mechanical capture will be evident by a palpable pulse, rise in blood pressure and improvement in conscious state (if not sedated and paralysed).
- **Caution**: If you suspect an inaccurate beat detection, change the selected lead to view the heart from a different angle. If this does not solve the suspected problem, change the selected size.

**Standby pacing:**
For certain patients at risk of symptomatic bradycardia, it may be advisable to use the unit in standby mode. In this mode the unit automatically provides a pacing stimulus whenever the patient’s heart rate drops below a predetermined level. Patient's ECG must be monitored using ECG leads and patient cables.

**Establish effective pacing. Note:**
- mA output at capture and run an ECG strip to document ECG morphology during capture.
- Set mA output to 10% higher than the minimum mA output necessary to effect consistent ventricular capture.
- Turn the pacing rate (ppm) below the patient’s heart rate. The pacing rate should be set at a level sufficient for adequate cardiac output.
- Check threshold periodically.

**Asynchronous pacing:**
- During asynchronous pacing the M series unit delivers an electrical stimulus regardless of patient’s heart rate. If any of the following conditions are present, it may be necessary to operate the pacemaker asynchronously:
  - ECG electrodes are not available.
  - ECG artefact is present.
  - Patient has Ventricular Tachycardia.
- Asynchronous pacing should only be performed in emergency situations when there are no other alternatives.
- If ECG cables are used during asynchronous pacing, ECG waveforms display and you can determine whether capture was achieved. While asynchronous pacing without ECG cables, no ECG activity displays, so other means for determining capture such as checking pulse are necessary.

**To pace asynchronously:**
- Turn Selector Switch to PACER.
- Press the Async Pacing On/Off softkey.
- Confirm that the ASYNC PACE message displays.
- While pacing a patient you should occasionally check the patient’s underlying rhythm to see if pacing is still required. This can be done quickly using the 4.1 Button.
- Whilst the 4.1 button is held down the pacer delivers an electrical impulse at one quarter the displayed rate. This enables you to see the patient’s underlying rhythm while safely pacing. Releasing the button will return the unit to normal pacing.
Problem Solving

Patient discomfort:
- Explain procedure; consider changing pad placement to anterior/posterior positions, initiate pain management.
- Diaphragmatic pacing is relatively frequent and may require sedation and ventilatory support at times.

Pacing problems, failure to:

Capture:
- Where pacing spikes are not followed by a broad QRS complex, the current is insufficient to stimulate the heartbeat. Increase current and consider other causes that might alter the threshold such as hypoxia, metabolic and electrolyte derangements. Another possibility is that the patient is moribund.

Sense:
- Over sensing occurs when the pacer interprets artefact as intrinsic rhythm and inhibits itself from firing. This may result in blood pressure drop. Reposition leads or electrodes and select the non-demand mode.
- Under sensing is when the pacer fails to detect intrinsic activity and paces inappropriately. Change the lead, and increase ECG size or reposition the electrodes.

Pace:
- Document the rate threshold, output, underlying rhythm and any adjustments made.
RAPID SEQUENCE INDUCTION (RSI) TO ENABLE ENDOTRACHEAL INTUBATION OF ADULT HEAD-INJURED PATIENTS

PRIMARY EMERGENCY INDICATIONS

- To enable intubation of adult, head injured patients for helicopter transport when it is not clinically appropriate to transport without intubation.

CONTRAINDICATIONS

- Ability to safely manage the patient without intubation.
- Known hypersensitivity to Suxamethonium.
- Known malignant hyperpyrexia.
- No IV access.

PRECAUTIONS / CONSIDERATIONS

- Time to hospital vs time to undertake the procedure.
- Anticipation of a difficult intubation e.g. morbid obesity, short neck, facial trauma, poor jaw opening.
- Impact of sedation on patient’s clinical status.
- Consequences of failed intubation in a sedated / paralysed patient.

PREPARATION

- Oxygenate, providing assisted ventilation if necessary.
- Position patient for intubation.
- Ensure appropriate monitoring (all essential):
  - Pulse oximetry.
  - Non invasive blood pressure.
  - Cardiac monitoring.
  - Capnography.
- IV access with running fluids.
- Medications drawn up ready for use.
- Check equipment including tested ETT and suction.
- Equipment for failed intubation drill immediately available.

PROCESS

- Optimise fluid status and oxygenation.
- Optimise patient position for intubation.
- Administer FENTANYL / MIDAZOLAM as per Table 1.
- Administer **SUXAMETHONIUM** 2mg/kg.
- Ensure drugs are flushed with a fluid bolus.
- Proceed with intubation after fasciculations cease and / or jaw muscle tone relaxed.

**DOSES OF FENTANYL AND MIDAZOLAM**

If elderly or evidence of impaired perfusion, Fentanyl dose is reduced.
For clearly hypoperfused patients that can not be corrected, Midazolam is not given.

<table>
<thead>
<tr>
<th>Fentanyl and Midazolam</th>
<th>Normal Adult</th>
<th>Small Adult or Elderly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses for RSI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well perfused</td>
<td>Fentanyl 200mcg</td>
<td>Fentanyl 100mcg</td>
</tr>
<tr>
<td></td>
<td>Midazolam 5mg</td>
<td>Midazolam 2.5mg</td>
</tr>
<tr>
<td>SBP &lt;100mmHg or poor</td>
<td>Fentanyl 100mcg</td>
<td>Fentanyl 75mcg</td>
</tr>
<tr>
<td>perfusion</td>
<td>Midazolam 2.5mg</td>
<td>No Midazolam</td>
</tr>
<tr>
<td>SBP &lt;90mmHg</td>
<td>Fentanyl 75mcg</td>
<td>Fentanyl 50mcg</td>
</tr>
<tr>
<td></td>
<td>No Midazolam</td>
<td>No Midazolam</td>
</tr>
</tbody>
</table>

Tracheal Intubation is confirmed as per Skill 307. ETCO2 monitoring is commenced immediately to confirm correct placement. Ventilation is adjusted to maintain ETCO2 at 30-35mmHg. Do NOT hyperventilate.

Where intubation fails consider and correct factors which prevented intubation. If appropriate, insert oral airway and manually ventilate, consider additional FENTANYL and / or MIDAZOLAM IV if necessary, then reattempt in order:
- 1 retry with bougie,
  - if unsuccessful, remove ETT, insert airway**
  - if unable to ventilate, then
- intubating LMA**,
  - if unsuccessful and unable to ventilate, then
- Cricothyrotomy

** if able to ventilate and oxygenate without ETT, allow relaxant to wear off and do not persist with attempts at intubation.

Following intubation, and objective confirmation of tracheal placement, where the patient subsequently becomes restless, maintain sedation using:
- **MIDAZOLAM** 2.5mg to 5mg IV boluses, OR
- **MORPHINE** and MIDAZOLAM infusion using a syringe pump or infusion device.
  - Preparation: MORPHINE 30mg and MIDAZOLAM 30mg diluted to 30mls with crystalloid.
  - Maintenance Dose: 5-10ml per hour titrated to effect.
  - Bolus Dose: 1-2mls as required.
**Maintain paralysis** with Rocuronium or Vecuronium as per CPG Medication CCP 11.31 Reocuronium Bromide (Esmeron).

**Prior to intubation**, the maximum dose should not exceed:
- FENTANYL 500mcg.
- MIDAZOLAM 0.2mg/kg.

**Hypotension** occurring at any time in patients with head injury must be promptly corrected.

**Any intravenous infusions** established under this CPG must be clearly labelled with the name and dose of any additive drugs and their dilution.

**Record** all medications administered, effects, adverse effects and routine observations.
PRIMARY CARE
CLINICAL PRACTICE GUIDELINES
IN
WESTERN AUSTRALIA

Authorised by:

Clinical Governance Operations Group

ST JOHN AMBULANCE AUSTRALIA (Western Australia) Inc.
Primary Care Clinical Practice Guidelines in Western Australia
January 2011

Preamble:

- The Primary Care Clinical practice Guidelines have been developed to provide guidance for those employees involved in Primary Health Care. This includes (but is not limited to) Industrial Medics / Paramedics and Community Paramedics.
- These supplementary Clinical Practice Guidelines is to be used in conjunction with the current Ambulance Paramedic Clinical Practice Guidelines, and are only to be used by authorised employees in these specific circumstances, when working for St John, having been trained and currently authorised to use them by St John Ambulance.
- Any new skill, procedure, medications or non-standard equipment must be endorsed by the Clinical Governance Operations Group and approved by the Medical Policy Committee prior to it being introduced to the site, depot or sub-centre.

Authority:

- Ambulance Paramedics, employed by St John Ambulance as Industrial Paramedics have authorisation to use skills and medications for which they have been trained and authorised as per current Ambulance Paramedic Clinical Practice Guidelines, as well as the skills, procedures and medications contained in the Primary Care Clinical Practice Guidelines.
- Industrial Paramedics / Medics have authorisation to use the paramedic initiated skills and medications for which they have been trained and authorised as per Clinical Governance approved schedule medication list for industrial paramedics found at: http://webserver.ambulance.net.au/quality/protocols_(non-medical).htm

Authority to Practice outside current Clinical Practice Guidelines:

- All skills, procedures or medications not authorised in the current Clinical Practice Guidelines will need to be approved by a nominated Medical Practitioner prior to this procedure being performed or medication administered.

Royal Flying Doctor Service (RFDS)

Some sites may require the assistance of the RFDS. Many sites have RFDS medical kits. The medical control physician or nominated practitioner must be contacted prior to involvement of the RFDS where possible.

Skills Requiring Authorisation on Each Occasion:

- All skills or procedures not covered by the current Clinical Practice Guidelines, including suturing.
- All prescription and scheduled medications not covered in the current Clinical Practice Guidelines (excluding non-prescription medications).
Primary Care Initiated Intervention

PC Guideline 1 - Burns
PC Guideline 2 - ECG (5 and 12 lead)

Medications

Codeine Containing Drugs
Non-Steroidal Anti-Inflammatory Drugs
Ondansetron
Specific information needed:

- Consider Danger to yourself and others first!
- Cause of burn and circumstances (chemical, steam, flame, extreme cold, accompanying explosion, toxic fumes, confined space, smoke exposure).
- Time elapsed since burn.
- Identify if patient was exposed to any contamination (e.g. cooled off in a dam, local lake or by bore water).

Specific physical findings:

- Extent of burns:
  - Description of areas involved, estimate using the Rule of Nines.
  - Cause of burn?
- Depth of burns:
  - Partial — redness or blistered only.
  - Full thickness – severely damaged skin or tissues.

Management:

- Danger, Response, Airway, Breathing, Circulation, Disability, Exposure.
- Oxygen, high concentration or 100%.
- Monitor Vital Signs and oxygen saturation.
- Pain relief — cooling with clean water, analgesia, burn dressing/gel/pads or wetted dressing/sheets. Avoid hypothermia.
- Carefully remove jewellery and clothing unless stuck.
- Cover burned area. apply acticoat dressing directly to wound, then gel/pads or wet sheet as appropriate — keep wet and blow air over or fan if possible to maintain cooling. Use water spray for patient comfort.
- Commence IV fluids to manage shock if indicated, continue with maintenance infusion as per Parkland’s formula for any second or third degree burns (4ml/kg x %surface area burnt), ½ of which to be administered within first 8 hours. Document total volume given.
- If IV not attainable, consider oral rehydration, little and often, if practicable.
- Monitor cardiac rhythm (where possible).
- Transport to a burns unit directly if no immediate life threat.
Specific precautions / notes:

- Leave unbroken blisters intact.
- Suspect airway burns and potential airway compromise in any facial burns or burns received in a closed space.
- Cooling of burn should ALWAYS utilise clean water to prevent infection.
- Deaths in the first 24 hours after burn injury are due to either airway burns or fluid loss, following this infection is a major cause of morbidity, as such Acticoat dressings should be applied ASAP.
- Consider carbon monoxide and cyanide poisoning (cyanide fumes arise from burning plastics, and are present in the smoke) in all closed space burns. Always consider non-burn injuries.
- Bypass to burns unit directly, with phone/radio patch to burns unit if:
  - >15% in adult, >10% in child.
  - Airway burns (if no immediate life-threat), burns of face, hands, feet, large joints, circumferential limb burns, perineum, and genitalia.
ECG Leads 5 and 12 Using Zoll M Series

Preparing to monitor with 12 leads:

Preparing patient:
- Remove all clothing covering the patient's chest.
- Clean and dry the patient’s skin.
- Clip excessive chest hair with scissors.
- Clean oily skin with alcohol swab.
- Briskly rub to dry and remove dead skin.

Attaching leads:
- Locate limb lead junction box in middle of ECG monitoring cable.
- Remove protective cap from the connector labelled V1-V6.
- Place end of V lead cable into connector.

Before applying ECG leads select V1 site:
- Place your finger on top of the jugular notch.
- Move your finger slowly down about 3.8cm (1.5 inches) until you feel a slight horizontal ridge.
- This location, known as the angle of Louis, is where the manubrium joins the sternum.
- Locate the second intercostal space on the right side lateral to and just below the angle of Louis.
- Move your finger down two more intercostal spaces to the fourth intercostal space.
- This location is the proper application site for the V1 lead.
- After you have located the V1 lead site, select the remaining application sites using figures 1, 2, 3 and 4.
- If the patient is shivering and arm placement not viable then place on torso as per figure 3.
FIGURE 4.

<table>
<thead>
<tr>
<th>AHA Labels</th>
<th>IEC Labels</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA (white)</td>
<td>R (red)</td>
<td>Right arm</td>
</tr>
<tr>
<td>LA (black)</td>
<td>L (yellow)</td>
<td>Left arm</td>
</tr>
<tr>
<td>RL (green)</td>
<td>N (black)</td>
<td>Right leg</td>
</tr>
<tr>
<td>LL (red)</td>
<td>F (green)</td>
<td>Left leg</td>
</tr>
<tr>
<td>V1</td>
<td>C1 red</td>
<td>As above</td>
</tr>
<tr>
<td>V2</td>
<td>C2 yellow</td>
<td>Fourth intercostal space, on left midclavicular line.*</td>
</tr>
<tr>
<td>V3</td>
<td>C3 green</td>
<td>Fifth rib, between leads V2 and V4.*</td>
</tr>
<tr>
<td>V4</td>
<td>C4 brown</td>
<td>Fifth intercostal space, on the left midclavicular line.*</td>
</tr>
<tr>
<td>V5</td>
<td>C5 black</td>
<td>Left anterior axillary line, at the horizontal level of V4.*</td>
</tr>
<tr>
<td>V6</td>
<td>C6 purple</td>
<td>Left midaxillary line, at the horizontal level of V4.*</td>
</tr>
</tbody>
</table>

* For female lead placement of V1, V2, V3, V4, V5 and V6 place electrode under the breast rather than on the breast.

**Displaying the 12 lead menu:**

- Turn the selector switch to monitor.
- Press the lead button to display any lead except pads.
- Press the 12 softkey.

The 12 lead menu displays at the bottom of the screen:

Acquire Settings PT Info Alarms Return
To acquire 12 lead waveforms:

- Press the soft key under display Acquire.
- The unit will display acquiring ECG message, wait ten seconds for the acquisition complete message to appear. The 12 lead data automatically prints after acquisition.
- If the leads have not been properly attached, one of the following messages displays:

<table>
<thead>
<tr>
<th>Display message</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>VX LEAD OFF</td>
<td>V lead not properly attached to patient. X denotes lead number.</td>
<td>Reattach</td>
</tr>
<tr>
<td>ECG LEAD OFF</td>
<td>One or more limb leads are not properly attached to patient.</td>
<td>Reattach</td>
</tr>
</tbody>
</table>

- To abort 12 lead monitoring press HALT key.

Reading 12 lead print out:

- First 2.5 seconds of each of the 12 leads is printed.
- Patient information.
- ECG analysis results using GE/Marquette 12SL TM Analysis Program.
- Detailed measurements of each segment of each lead.

Five lead placements are as per figure 5.

![FIGURE 5](image-url)
CLINICAL PRACTICE GUIDELINES

FOR

ADMINISTRATION OF

MEDICATIONS
# MEDICATIONS

**ST JOHN AMBULANCE AUSTRALIA (Western Australia) Inc.**  
Authority to use medication/s matrix

## KEY

<table>
<thead>
<tr>
<th>Role</th>
<th>Symbol</th>
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</thead>
<tbody>
<tr>
<td>Ambulance Transport Officer</td>
<td>ATO</td>
</tr>
<tr>
<td>Industrial Medics</td>
<td>IM</td>
</tr>
<tr>
<td>Industrial Paramedic</td>
<td>IP</td>
</tr>
<tr>
<td>Ambulance Officer G1</td>
<td>AOG1 (S = Supervised by Paramedic)</td>
</tr>
<tr>
<td>Ambulance Officer G2</td>
<td>AOG2 (S = Supervised by Paramedic)</td>
</tr>
<tr>
<td>Paramedic</td>
<td>P</td>
</tr>
<tr>
<td>Critical Care Paramedic</td>
<td>CCP</td>
</tr>
<tr>
<td>USAR</td>
<td>U</td>
</tr>
</tbody>
</table>

## MEDICATION

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>ATO</th>
<th>IM</th>
<th>IP</th>
<th>AOG1</th>
<th>AOG2</th>
<th>P</th>
<th>CCP</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adrenaline</td>
<td></td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Adrenaline EpiPen</td>
<td>X</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Atox Combopen</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
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<td>Cophenylcaine</td>
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<td>X</td>
<td>X</td>
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<td>Fentanyl Citrate</td>
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<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Glucagon</td>
<td>X</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Glucose Oral Gel</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Haloperidol</td>
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<td>S</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>N/S Hartman's</td>
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<td>X</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Intravenous Glucose 10%</td>
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<td></td>
<td></td>
<td></td>
<td>S</td>
<td>X</td>
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<tr>
<td>Glyceryl Trinitrate (Nitrolinguai®)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ketamine</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lignocaine</td>
<td>X</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Methoxyflurane</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Midazolam</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Naloxone</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ondansetron</td>
<td>X</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Paracetamol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Salbutamol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**NOTE:** Ambulance Officers studying for the Paramedic degree supervised by a Paramedic, may draw up and administer all medications as used by the Paramedic.
Critical Care Paramedics Medications

11.7 Amiodarone
11.9 IV Atropine Sulphate
11.11 IV Dextrose 5%
11.18 IV Haloperidol (Serenace)
11.22 IV Midazolam
11.26 IV / IM Metoclopramide (Maxalon)
11.28 IV Morphine Sulphate / Midazolam Infusion
11.32 Promethazine (Phenergan)
11.33 IV Rocuronium Bromide (Esmeron)
11.35 IV Suxamethonium Chloride

Primary Care Medications

Codeine Containing Drugs
Non-Steroidal Anti-Inflammatory Drugs
Ondansetron
USE OF MIMS: (Monthly Index of Medical Specialties)

MIMS is an initial reference about drugs, NOT a detailed authority or textbook. It contains:

- **A Therapeutic Class Index**, which lists types of drugs under the various systems, and gives the page reference.
- A few new products (Stop Press) and revised information (Cumulative List) are at the beginning of MIMS.
- **Index of Proprietary and Generic Names** is at the back of the manual and is the main body of the MIMS.
- At the beginning of each sub section (a, b, c etc.) of Information by Therapeutic Class, there may be a general note relevant to most of the drugs in that area. This gives examples, general information about their actions and adverse reactions.
- Each entry in the Index includes:
  - The trade name and manufacturer.
  - The generic (proper) name.
  - The strength.
  - Information about prices and numbers available.
  - Suggested doses in heavy type.
  - Contra = Contraindications. Reading of these may give information about likely side effects.
  - Prec = Special precautions. This section will indicate possible problems or use with various conditions.

- MIMS may be used to identify, from a drug name, the class of drug and an indication of its type of action. To do so:
  - Use the Index at the back to look up drug name and turn to appropriate page.
  - Identify medication.
  - **Look at section heading** for general class of drug.
  - Look for main uses of medication. If in doubt consult Medical Director.

Remember MIMS is an index, not a textbook or instruction manual. Use of the drugs must be decided by a Medical Practitioner or a person with appropriate training to decide between the relevant drugs. Information in here is brief and orientated towards the drug firms’ recommendations. It does not give relative merits of differing medications.
Medications
11.2 SPECIAL AUTHORITY
October 2004

- Paramedics may be authorised to administer a medication not carried in an ambulance and / or not authorised for this use by the Clinical Practice Guidelines.
- This will be limited by the knowledge of the Paramedic in regard to the medication.
- This will only be when the medication has already been commenced and is authorised by the referring doctor, by completion of the Special Medication Authority and Record — St John Ambulance (Western Australia) Inc.
- Infusions will continue to be managed in accordance with the same form.

Bolus Medication:
- These are Special Medication Authority medications, which may be prescribed by a physician, for administration during transport.

Please note:
- There must be a written prescription for the medication, dose, route (preferably IM) and the trigger event for administration.
- Possible adverse effects must be specified (including instructions for discontinuing administration of the drug) on the approved form, in duplicate, or copy of completed form.
- For all other requests to give non-guideline medications, PRIOR authorisation is to be sought through the Communications Centre from:
  - Medical Director.
  - His nominated deputy ASMO (Ambulance Service Medical Officer).
St John Ambulance Australia (Western Australia) Inc.

Special Medication Authority and Record

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Patient name / d.o.b.**

**Principle Diagnosis**

<table>
<thead>
<tr>
<th>Infusion medication</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dose - mg/hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dose - ml/hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible adverse effect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bolus Medication (see “notes”)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Route</td>
<td>(I/V)</td>
<td>(I/M)</td>
</tr>
<tr>
<td>Dose - mg or ml</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Event trigger</strong> for dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible adverse effect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Authorising Signature:**

**Authorising Doctor's name:**

**Medication Record:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Dose rate mg/hr</th>
<th>Dose rate ml/hr</th>
<th>Sys B/P</th>
<th>Comments / effect.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Paramedic Number**

**Paramedic/ A/O Number**

Original to SJAA with Patient Care Record form, copy with patient.

Contact Phone Number:

**Physician Directions:** Attach notes if necessary.
Types of Injections:

- Intra muscular.
- Intravenous.

Authority:

Intramuscular (Skill 605)

- Ambulance Paramedics employed by St John Ambulance as Industrial Paramedics have authorisation to administer medications as per ‘On Road’ Clinical Practice Guidelines provided they maintain competency as Ambulance Paramedics.
- Industrial Medics employed by St John Ambulance have authorisation to administer specific medications including IM Glucagon as per ‘On Road’ Clinical Practice Guidelines.
- All other medications require authority, and instruction from the Medical Control Physician or as per Royal Flying Doctor Service (RFDS) Medical Officer (where appropriate) prior to administration of IM. medications not covered by the Clinical Practice Guidelines.

Intravenous (Skill 606 and 608)

- No medications are to be given intravenously without a specific documented authority from the medical control physician on each occasion unless the medication is used as per Clinical Practice Guidelines.
- The Physician is to be advised on each occasion that no training has been given for administering intravenous medication, if this route is requested.

Dangers:

- IV injections work rapidly, powerfully.
- Once injected, can’t be stopped or retrieved.
- Narcotics — respiratory depression, nausea, vomiting, dizziness.
- Antibiotics — allergy, sweating, nausea, vomiting, diarrhoea.
- Can damage vein — pain, inflammation, spasm, thrombosis.
- Sedatives — slow or stop breathing, alter or abolish consciousness, vomiting, airway control impaired.
- Adrenaline — VERY powerful and dangerous IV — potentially lethal ventricular fibrillation can occur.

**ALL IV INJECTIONS MUST HAVE MEDICAL AUTHORITY BEFORE ADMINISTRATION ON EACH OCCASION.**
Acetyl-Salicylic Acid (Aspirin)

Presentation
- White scored 300mg tablet of Soluble Aspirin (Disprin) or Disprin direct.

Pharmacology and Action
- Mild anti-clotting agent. Inhibits prostaglandin synthesis. Reduces aggregation and adhesion of platelets, hence prevents extension of clot.
- Shown to reduce mortality significantly in Acute Myocardial Infarction.

Primary Indication
- Chest pain, of presumed cardiac origin, even if pain has now subsided

Contra Indication
- Too nauseated to swallow.
- History of aspirin hypersensitivity, or allergy.
- If patient firmly states their doctor says they must never take aspirin — don’t insist!
- Is taking an anticoagulant medication. e.g. Warfarin.
- Asthmatics. May be given only if they have had Aspirin previously without problems. If they have not had Aspirin before, do not give.

Route of Administration
- Oral.

Dose
- 300mg, once only (one whole tablet, even if patient is already taking Aspirin).

Children
- Not applicable.

Side Effects
- Occasional indigestion type pain.
- Rarely exacerbation of bleeding.

Precautions
- Nil except above.

Administration
- Check with partner — correct medication and dose.
- Give orally, with water to swallow, or dissolve in water to drink.
Medications

11.5 ADRENALINE

July 2010

Adrenaline

Presentation
- 1:1000, 1.0mg in 1.0ml ampoule.

Pharmacology and Action
- A naturally occurring catecholamine — sympathomimetic agent.
- Stimulates the ALPHA and BETA subdivisions of the sympathetic nervous system to produce effect.
- ALPHA Stimulation causes peripheral vasoconstriction.
- BETA 1 Stimulation causes increased cardiac contractility and stimulates conducting tissue (Sino-Atrial node, Atrio-Ventricular node).
- BETA 2 Stimulation causes bronchodilatation and dilation of blood vessels in muscles.
- IV onset 30 seconds, peak in 3-5 minutes duration 5-10 minutes.
- IM onset 30-90 seconds, peak in 4-10 minutes, duration5-10minutes.

Primary Indication
- Cardiac Arrest including: ventricular fibrillation, ventricular tachycardia, asystole and pulseless electrical activity (PEA).
- Anaphylactic shock.
- Severe asthma.
- Severe Croup with retractive breathing.

Route Of Administration
- IM lateral thigh (preferably) or deltoid muscle.
- Nebulised.
- IV in cardiac arrest.

Dose

Adult Asthma / Anaphylaxis
- 0.5 mg. (0.5ml of 1/1000). May repeat 5–10 minutely as clinically indicated.

Children Asthma / Anaphylaxis

<table>
<thead>
<tr>
<th>Age/Size</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 6 months</td>
<td>0.05mg in 0.05mls</td>
</tr>
<tr>
<td>6 months to 2 years of age</td>
<td>0.1mg in 0.1mls</td>
</tr>
<tr>
<td>2 – 5 years of age</td>
<td>0.2mg in 0.2mls</td>
</tr>
<tr>
<td>6 -12 years of age</td>
<td>0.3mg in 0.3mls</td>
</tr>
</tbody>
</table>

- Repeat 5 - 10 minutely as clinically indicated.

Croup
- 5mg/5mls nebulised, once only

Adult Cardiac Arrest
- 1mg IV every 3 minutes.

Side Effects
- Sinus tachycardia.
- Supraventricular arrhythmias.
- Ventricular arrhythmias
- Hypertension.
- Pupil dilation, tremor, anxiety, palpitations.

Precautions

But life saving Adrenaline comes first
- Angina.
- Acute Myocardial Ischaemia.
- Acute Left Heart Failure.
- Exclude cardiac causes of wheezing in patients over 50.
- Severe hypertension

Administration

- Prepare injection. Check with partner — correct medication and dose.
- Give IM/IV injection.
- Record dose (in mg) and time.
- Monitor and record Vital Signs and effects.
EpiPen Adrenaline

Presentation
- EpiPen (yellow) = 0.3mg.
- EpiPen Jnr (green/white) = 0.15mg.

Pharmacology and Action
- A naturally occurring sympathomimetic agent.
- Causes peripheral vasoconstriction.
- Stimulation of cardiac conduction system causes increased contractions.
- Causes bronchodilatation and dilation of blood vessels in muscles.

Primary Indication
- Anaphylaxis

Route of Administration
- EpiPen to the mid-lateral thigh.

Dose
Adult or over 30kg
- EpiPen (0.3mg) repeat every 5 - 10 minutes if still life threatening as clinically required.

Children
- Less than 30kg, administer EpiPen Jnr (0.15mg).
- If after 10 minutes the child's condition is still life threatening administer a second and final EpiPen Jnr (0.15mg).

Onset
- Onset 30 - 90 seconds, maximum in 5 - 10 minutes.

Side Effects
- Tachycardia, arrhythmias.
- Increase in blood pressure (may be marked).
- Pupils dilate, tremor, anxiety, pale.

Precautions
(However, life saving “EpiPen” Adrenaline comes first).
- Angina.
- Acute Myocardial Ischaemia.
- Acute Left Heart Failure.
- Severe hypertension (use with care if indicated for a life-threatening problem).

Administration
Prepare EpiPen auto injection.
- Check with partner — correct medication and dose.
- Give IM auto injection.
- Record dose (EpiPen or EpiPen Jnr) and time.
- Monitor and record Vital Signs and effects.
- Note: patient's own EpiPen may used.
- Caution:
  - Watch for possible needle stick injury as patient may have used their own EpiPen.

Prepare Patient for Transport
- Patients must be prepared and transported without delay to a definitive medical facility.
- Do not wait for Medication to take effect.
Amiodarone

Presentation
- 150mg in a 3ml ampoule.

Pharmacology
- An anti-arrhythmic agent active at multiple sites; prolongs the action potential duration and hence refractory period of atrial, nodal and ventricular tissue. The site and mode of action can be summarised by its effect on myocardial electrophysiology.
- Sinus Node: it decreases sinus automaticity by reducing the slow diastolic depolarisation gradient in the nodal cell.
- AV Node: reduces the speed of conduction and increases the refractory period of AV node.
- HIS Purkinje System: increases the refractory period but does not modify the speed of conduction of the system.
- Contractile Fibres: increases the action potential but does not alter the rate of depolarisation of the atrial or ventricular cells; this is more marked in the atria than the ventricles.
- Onset: Immediate.
- Peak: <10 min.
- Duration: 30-60 min.

Metabolism
- By the liver and intestines and excreted almost completely in faeces via biliary elimination.

Primary Emergency Indications
- Cardiac arrest with persistent or recurrent ventricular fibrillation/ventricular tachycardia.

Contraindications
- None in cardiac arrest

Precautions
- Heart failure.
- Thyroid dysfunction.

Route Of Administration
Intravenous

Dose
- 300mg IV, repeat with 150mg once if required.
- Administer undiluted and flush with normal saline.

Side Effects
- Flushing and sweating.
- Hypotension.
- Bradycardia.
- Polymorphic tachycardias.
Amiodarone

Presentation
- 150mg in a 3ml ampoule.

Pharmacology
- An anti-arrhythmic agent active at multiple sites; prolongs the action potential duration and hence refractory period of atrial, nodal and ventricular tissue. The site and mode of action can be summarised by its effect on myocardial electrophysiology.
- Sinus Node: it decreases sinus automaticity by reducing the slow diastolic depolarisation gradient in the nodal cell.
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- Contractile Fibres: increases the action potential but does not alter the rate of depolarisation of the atrial or ventricular cells; this is more marked in the atria than the ventricles.
- Onset: Immediate.
- Peak: <10 min.
- Duration: 30-60 min.

Metabolism
- By the liver and intestines and excreted almost completely in faeces via biliary elimination.

Primary Emergency Indications
- Cardiac arrest with persistent or recurrent ventricular fibrillation/ventricular tachycardia.
  Tachyarrhythmia's including:
  - SVT.
  - Nodal and Ventricular Tachycardia.
  - Atrial flutter and fibrillation.
  - Tachyarrhythmia's associated with WPW syndrome.

Contraindications
- Known hypersensitivity to amiodarone or iodine.
- Bradycardia or AV block.
- Sick sinus syndrome.
- Severe conduction disorders.
- Hypotension.
- Severe respiratory failure.
- Circulatory collapse.

Precautions
- Heart failure.
- Thyroid dysfunction.

Route Of Administration
Intravenous
Dose – Tachyarrhythmia's
- 5-7mg/kg by infusion over 20-30 minutes.

Dose – Cardiac arrest
- 300mg IV, repeat with 150mg once if required.
- Administer undiluted and flush with normal saline.

Side Effects
- Flushing and sweating.
- Bradycardia.
- Polymorphic tachycardias.
- Bronchospasm.
- Nausea.
- Tremor.
- Dizziness.
- Paraesthesia.
- Head aches.

Special Notes
- Amiodarone hydrochloride injection is incompatible with saline and during infusion should be administered solely in 5% dextrose solution.
Medications

11.8 ATOX™ COMBOPEN

August 2008

Atropine and Obidoxime

Presentation

- ComboPen (2mg atropine sulphate and 220mg obidoxime chloride in 2ml).

Pharmacology and Action

- The two drugs work in synergy.

Atropine

- Antagonizes effects of acetylcholine at receptors.
- Particularly effective in decreasing secretions and treating bradycardia.

Obidoxime

- Reactivates inhibited cholinesterase enzyme, thereby decreasing the amount of excess acetylcholine.
- Removes organophosphate from enzyme complex.

Primary Indication

- For use in life-saving situations only for patients who are demonstrating signs and symptoms of exposure to organophosphorus nerve agents. This exposure may produce the following effects.
- Severe bradycardia (<40 bpm), bronchospasm, bronchorrhoea, copious secretions (a useful acronym is SLUDGEM):
  - Salivation
  - Lacrimation
  - Urination
  - Defecation
  - Gastric Distress
  - Excess sweating
  - Miosis (constricted pupils).
- Muscle fasciculation (twitching), weakness, respiratory paralysis;
- Emotional lability, confusion, ataxia, convulsions, coma and central respiratory depression.

Route of Administration

- ComboPen — intramuscular auto-injection only in mid-lateral quadriceps muscle.

Dose

Adult (and children > 16 years)

- ComboPen (2ml).
- Repeat if still life threatening after 5-15 minutes (2 x repeats — adult only).
- If severe poisoning consider administration of 3 x ComboPen injectors in rapid succession.

Children (8-16 years)

- ComboPen (2ml) – repeat once as above to maximum 2 x dose.

Children (< 8 years)

- ComboPen (2ml) no repeats.

Onset

- 30-90 seconds.
- Maximum in 5-10 minutes.

Side Effects

- Pain at injection site.
- Blurred vision, headache, nausea.
- Hyperventilation.
- Mild to moderate hypertension and tachycardia.
- Dizziness, drowsiness.

Precautions

- Staff to observe precautions to prevent exposure / poisoning.

Administration

- Injection must be approved directly by the State Health Coordinator or his proxy.

Prepare ComboPen auto injection

- Check with partner — correct medication and dose.
- Give IM auto injection.
- Record dose and time.
- Monitor and record Vital Signs and effects.

Prepare Patient for Transport

- Following Decontamination
- Notify receiving hospital.
- Patients must be prepared and transported without delay to a definitive medical facility.
- Do not wait for medication to take effect.
Atropine Sulphate

Presentation
- 0.6mg in 3ml ampoule.

Pharmacology
- An anticholinergic agent.
- Inhibits the actions of acetylcholine on post-ganglionic cholinergic nerves at the neuro-effector site; as a vagal blocker, allows sympathetic effect to:
  - Increase pulse rate by increasing SA node firing rate.
  - Increase the conduction velocity through the AV node.
- Antidote to reverse the effects of cholinesterase inhibitors (e.g. Organophosphate insecticides) i.e: reduces excessive salivation, sweating, gastrointestinal and bronchial secretions and relaxes smooth muscles.

Metabolism
- By the liver and excreted mainly by the kidneys.

Primary Emergency Indications
- Bradycardia with poor perfusion.
- Organophosphate poisoning with excessive cholinergic effects.

Contraindications
- Nil of significance in the above indications.

Precautions
- Atrial flutter.
- Atrial fibrillation.
- Do not increase heart rate above 100/minute – except in children under 6 years.
- Glaucoma.

Route of Administration
- Intravenous.
- Intramuscular.
- Endotracheal.

Dose

Adult
- Bradycardia: 0.6mg every 1-5 mins titrated to effect. Maximum dose 3mg.
- Large doses (in excess of 5mg) may be required in organophosphate poisoning. Titrate against a decrease in oral secretions.

Child
- 0.02mg/kg
- Minimum dose: 0.1mg
- Maximum (initial) dose: 1mg

Side Effects
- Tachycardia.
- Palpitations.
- Dry mouth.
- Dilated pupils.
- Visual blurring.
- Retention of urine.
- Confusion, restlessness (in large doses).
- Hot, dry skin (in large doses).

Onset and Duration

Intravenous Effects:
- Onset: < 2 min.
- Peak: < 5 min.
- Duration: 2-6 hrs.
MEDICATIONS FOR PRIMARY CARE
CODEINE CONTAINING DRUGS
January 2011

Presentation
- Aspalgin (Aspirin 300mg, Codeine 8mg) (See Aspirin guideline as well).
- Ibuprofen 200mg + Codeine 12.8mg (See NSAID guideline as well).

Pharmacology and Action
- Codeine is considered a prodrug, since it is metabolised in vivo to the primary active compounds morphine and codeine-6-glucuronide (C6G). Roughly 5-10% of codeine will be converted to morphine, with the remainder either free, conjugated to form codeine-6-glucuronide (~70%), or converted to norcodeine (~10%) and hydromorphone (~1%).

Primary Indication
- Moderate to strong pain.
- See NSAID indications.

Contraindication
- Known hypersensitivity to codeine, aspirin or ibuprofen.
- Asthmatic that is aspirin or NSAID sensitive.
- Active gastrointestinal bleeding or peptic ulceration.
- Pregnant patients.
- Need to drive, operate heavy machinery, or work at heights.
- Constipated patients.

Route of Administration
- Oral.

Dose
Aspirin and Codeine (Aspalgin)
- 2 tablets every 4 hours to a maximum of 8 tablets per day.
- Dissolve the tablets in a little water before swallowing them.
- Aspalgin can be taken with or without food.
- Not recommended for children under 12 years of age.

Ibuprofen + Codeine (Nurofen Plus)
- Adults and children from 12 years: 2 tablets, then 1 or 2 tablets every 4 hours as necessary (maximum 6 tablets in 24 hours).
- Not for children under 12 years.

Side Effects
- Respiratory depression in large enough doses.
- Constipation.
- Nausea.
- Euphoria.
- Drowsiness.
- Dry mouth.
- Miosis.
- See side effects of Aspirin and NSAIDS

Precautions
- See NSAIDS and Aspirin precautions.
- Can develop dependency with long term use.

Administration
- Check with partner — correct medication and dose.
- Give orally, with water to swallow.
Cophenylcaine

Presentation
- Pump actuated topical spray containing 50mg per ml.
- 1 dose (squirt) is 100mcl or 5mg.

Pharmacology and Action
- Topical local anaesthetic agent causing numbness, relief of surface pain, and relief of nasal/oral bleed (by vasoconstriction).

Primary Indication
- Local pain e.g. of abrasions, small cuts and wounds.
- Relief of mild and moderate epistaxis.
- Post tonsillectomy haemorrhage.
- Intra oral haemorrhage.

Contraindication
- Known hypersensitivity to lignocaine or other local anaesthetics.
- Known hypersensitivity to phenylephrine.
- Children under 2 years old.
- Pregnancy.

Route of Administration
- Tropically
- Intra nasally.
- Intra orally.

Dose
Adult
- Max 25mg/5 squirts (topically) adult.
- As on bottle for intranasal use.
- (Oral use) One spray and then wait 1-2 minutes, repeat if required.

Children
- Dose maximum as on bottle, according to age and size.
- (Oral use) One spray and then wait 1-2 minutes, repeat if required.

Onset
- Rapid onset.

Side Effects
- Transient bitter taste during oral administration.

Precautions
- During oral use, the nozzle is only to be inserted within the anterior 1/3 of the mouth to avoid gag reflex stimulation.
- Patients with cardiovascular disease (hypertension, severe bradycardia and dysrhythmia's).

Administration
- As on directions.
- Check with partner correct medication and dose.
- Monitor effects.
- Record dose and effects.
- Do not administer multiple sprays in quick succession; this may produce cardiovascular side effects.
Dextrose 5%

Presentation
- 100ml infusion soft pack.

Pharmacology
- An isotonic crystalloid solution.

Metabolism
- Dextrose:
  - Broken down in most tissues.
  - Stored in liver and muscle as glycogen.
- Water:
  - Excreted by the kidneys.
  - Distributed throughout total body water, mainly in the extracellular fluid compartment.

Primary Emergency Indication
- Vehicle for diluting and intravenous administration of emergency drugs.

Contra-Indications
- Not to be used for volume replacement.

Precautions
- Nil of significance in the above indication.

Route of Administration
- Intravenous infusion.

Side Effects
- Nil of significance in the above indication.

Special Note
- Intravascular half life is approximately 20-40 minutes.
Fentanyl Citrate

Presentation
- 100mcg in 2ml ampoule (50mcg/ml.)

Pharmacology
- A short acting synthetic narcotic analgesic.
- Central Nervous System effects:
  - Analgesia.
  - Depression of conscious state.
  - Respiratory depression – leading to apnoea.
  - Dependence (addiction).
- Cardiovascular effects:
  - Decreases conduction velocity through the AV Node.
- Musculoskeletal effects:
  - May increase muscle tone, causing truncal and jaw rigidity.

Metabolism
- By the liver and excreted by the kidneys.

Primary Emergency Indications
- Analgesia.

Contraindications
- Known hypersensitivity
- Less than 2 years of age.

Precautions
- Elderly patients.
- Impaired renal / hepatic function.
- Respiratory depression e.g. CAL.
- Current asthma.
- Patients on monoamine oxidase inhibitors.
- Known addiction to narcotics.

Route of Administration
- Intravenous.

Dose (Adult)
- Increments of 10 – 25mcg IVI titrated to effect on 5 minute intervals.

Dose (Child)
- 1 mcg/kg to a maximum dose of 25mcg IVI titrated to effect on 5 minute intervals.

Side Effects
- Central nervous system depression.
- Respiratory depression.
- Rigidity of the diaphragm, intercostal muscles and jaw.
- Bradycardia.
- Nausea / vomiting.
- Hypotension.

Onset And Duration
  Intravenous Effects:
  - Onset: 30 - 60 seconds.
  - Peak: 2 - 5 min.
  - Duration: 30 - 60 min.

Special Notes
- Respiratory depression can be reversed with Naloxone Hydrochloride.
- Concurrent use of narcotics and benzodiazepines may result in increased CNS depression.
- Concurrent use of IV Fentanyl and Ketamine requires medical advisor authorisation.
Fentanyl

Presentation
- 600 mcg in 2.0ml (300 mcg / ml) in glass vial, tamper-evident seal.

Pharmacology
- A short acting synthetic narcotic analgesic.
- Central Nervous System effects:
  - Analgesia.
  - Depression of conscious state.
  - Respiratory depression – leading to apnoea.
  - Dependence (addiction).
- Cardiovascular effects:
  - Decreases conduction velocity through the AV Node.
- Musculoskeletal effects:
  - May increase muscle tone, causing truncal and jaw rigidity.

Metabolism
- By the liver and excreted by the kidneys.

Primary Emergency Indications
- Analgesia.

Contra Indication
- Known hypersensitivity to Fentanyl (rare)
- Occluded nasal passages or bleeding nose

Onset And Duration
- Onset 2-5 minutes
- Half-life 30-60 minutes.

Route of Administration
- Intra-nasal spray using syringe and mucosal atomiser.

Side Effects
- Central nervous system depression.
- Respiratory depression
- Rigidity of the diaphragm, intercostal muscles and jaw.
- Bradycardia.
- Nausea / vomiting.
- Hypotension

Special Notes
- Respiratory depression can be reversed with Naloxone Hydrochloride.
- Concurrent use of narcotics and benzodiazepines may result in increased CNS depression, hypotension and respiratory depression.

Dose Chart

<table>
<thead>
<tr>
<th>Age</th>
<th>First Dose</th>
<th>Subsequent at 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 years &lt; 20 Kg</td>
<td>1 x 0.05ml (15 mcg)</td>
<td>1 x 0.05ml (15 mcg)</td>
</tr>
<tr>
<td>6-10 years 21-30 Kg</td>
<td>1 x 0.10ml (30 mcg)</td>
<td>1 x 0.10ml (30 mcg)</td>
</tr>
<tr>
<td>11-15 years 31-40 Kg</td>
<td>1 x 0.15ml (45 mcg)</td>
<td>1 x 0.15ml (45 mcg)</td>
</tr>
<tr>
<td>Small/elderly/frail</td>
<td>2 x 0.2ml (120 mcg)</td>
<td>1 x 0.2ml (60 mcg)</td>
</tr>
<tr>
<td>Adult</td>
<td>3 x 0.2ml (180 mcg)</td>
<td>1 x 0.2ml (60 mcg)</td>
</tr>
</tbody>
</table>
Glucagon

Presentation
- 1mg in 1ml vial, accompanied by diluent for injection. This agent is not pre-mixed.

Pharmacology and Action
- Hormone which causes an increase in blood glucose concentration, by converting stored liver glycogen to glucose. It is effective in small doses and no evidence of toxicity has been reported with its use.

Primary Indication
Demonstrated hypoglycaemia in:
- Altered conscious state in a known Diabetic.
- Altered conscious state of unknown medical cause, in whom hypoglycaemia is identified by test of Blood Sugar Level (BSL) as below 4mmol/L.

Contra Indication
- Nil, in above cases.

Route of Administration
- Intramuscular injection only to deltoid or mid lateral thigh.

Dose
- 1mg in 1ml IM.
- Administer 10% IV Glucose or repeat IM Glucagon after 10 minutes if little or no improvement or the patient’s condition deteriorates.

Onset And Duration
- 4 - 7 minutes approx.
- Duration / effect 10 - 30 minutes.

Side Effects
- Nausea, vomiting (rare).

Precautions
- Even though some patients may recover fully, all should be transported to a medical facility to ensure effective follow up and review.

Administration
- Confirm hypoglycaemia (BSL) or altered conscious state in known diabetic.
- Monitor all Vital Signs, conscious state and ECG where possible.

Prepare injection:
- Check with partner — correct medication and dose.
- Prepare injection site — Deltoid muscle. Mid antero-lateral thigh is an acceptable alternative.
- Administer intramuscular injection of 1mg Glucagon (1ml).
- Record medication administration time and results on Patient Care Record Form.
- Monitor — Vital Signs, effects and record. Repeat BSL as clinically required.

Prepare Patient for Transport
- Patient must be prepared and transported without delay.

Children (Single Dose Only)
- 0 - 5 years .5mg in 0.5ml.
- 6 - 12 years 1.0mg in 1.0ml.
Instaglucose™ Glutose 15™

Presentation
- Flavoured glucose gel in flexible sealed tube, twist-off top, single patient use.

Pharmacology and Action
- Glucose preparation rapidly absorbed from oral / buccal mucosa.
- Causes an increase in blood glucose concentration.
- No evidence of toxicity has been reported with its use.

Primary Indication
- Demonstrated hypoglycaemia in:
  - Altered conscious state in a known diabetic.
  - Altered conscious state of unknown medical cause, in whom hypoglycaemia is identified by test of Blood Sugar Level (BSL) as below 4mmol/L.

Contra Indication
- None.

Route Of Administration
- Oral only.

Dose
- Contents of tube, or as much as practical.
- May give any remaining, as consciousness returns.
- Repeat after 10 mins if still altered consciousness, or deteriorating again.

Children
- Use proportion of tube contents.

Onset And Duration
- 2-5 minutes approx.
- Duration / effect 12-25 minutes.

Side Effects
- None.

Precautions
- Even though some patients may recover fully, all should be transported to a medical facility to ensure effective follow up and to review cause.
- Keep below 25°C if possible.
- Liquefies when over 30°C (still usable). Re-cool if possible.

Administration
- Confirm hypoglycaemia (BSL) or altered conscious state in known diabetic.
- Monitor all Vital Signs, conscious state and ECG where possible.

Prepare medication
- Check with partner — correct medication. Patient lying on side if altered consciousness, to avoid possible inhalation of gel.
- Squeeze contents of tube into lower cheek pouch over gums / cheek. Externally massage cheek.
- Record medication administration time, and results, time of recovery on Patient Care Record Form.
- Monitor — Vital Signs, effects and record. Repeat BSL as clinically required.

Prepare Patient for Transport
- Patient must be prepared and transported without delay.
- Do not wait for Medication to take effect.
- If conscious — give glucose drink or food. Can use Glucose Oral Gel as per instructions on package. Follow up with complex carbohydrates (e.g. sandwich) if patient’s condition allows.
Medications
11.17 HALOPERIDOL
August 2008

Haloperidol (Serenace)

Presentation
• 5mg in 1ml ampoule.

Pharmacology and Action
• Major tranquilliser.
• Acts on midbrain, brainstem and reticular formation.
• Inhibits impulses from diencephalon and cortex.
• Depresses the central nervous system.
• Sedation.
• Anti-emetic.
• Metabolised by the liver.

Primary Indication
• For sedation in patients who are violent or aggressive, and at danger of harming themselves or others and requiring restraint, e.g. patients suffering hallucinations and paranoia or presumed drug effects.
• Sedation is only to be used as a last resort to get patients to hospital safely when all other options (e.g. negotiation) in such situations are ineffective. In all cases, organic causes such as hypoxia and hypoglycaemia must be excluded or treated as soon as possible.

Contraindication
• Not indicated for children.
• Parkinson disease.
• Known severe adverse reactions.

Route of Administration
• Intramuscular injection.

Dose
Adult
• 5-10mg (each vial 5mg in 1ml).
• If small, frail or over 65 — try half adult dose first — minimises respiratory depression and hypotension.

Onset and Duration Intramuscular
• Onset 2-3 minutes
• Peak 10-20 minutes
• Duration 2-3 hrs

Side Effects
• Hypotension (can be severe) particularly in dehydrated patients.
• Lethargy and drowsiness.
• Extrapyramidal reaction.
• Anxiety and euphoria
• Respiratory depression.

Precautions
• Administration to patients who have taken alcohol or other drugs may cause severe hypotension.
• Impaired level of consciousness.
• Elderly debilitated patients.
• Severe cardiovascular disorders.
• History of dystonic reactions.

Administration
• Restrain patient with minimum force necessary.
• Consider Midazolam as an alternative or additional agent.
• Prepare injection.
• Check with partner — correct medication and dose.
• Administer IM injection.
• Record dose (in mg) and time.
• Monitor and record Vital Signs and effects.
• If hypotensive, consider IV fluids.

Prepare Patient for Transport
• Patients must be prepared and transported without delay.
Haloperidol (Serenace)

Onset and Duration
Intravenous effects:
- Onset 1-2 minutes
- Peak 5-10 minutes
- Duration 1-2 hrs

Pharmacology and Action
- Major tranquilliser.
- Acts on midbrain, brainstem and reticular formation.
- Inhibits impulses from diencephalon and cortex.
- Depresses the central nervous system.
- Sedation.
- Anti-emetic.
- Metabolised by the liver.

Primary Indication
- For sedation in patients who are violent or aggressive, and at danger of harming themselves or others and requiring restraint, e.g. patients suffering hallucinations and paranoia or presumed drug effects.
- Sedation is only to be used as a last resort when all other options (e.g. negotiation) are ineffective. In all cases, organic causes such as hypoxia and hypoglycaemia must be excluded or treated as soon as possible.

Contraindication
- Not indicated for children.
- Parkinson disease.
- Known severe adverse reactions.

Route of Administration
- Intravenous injection.

Dose
- 2.5-5mg every 5-10 minutes as necessary.
- If small, frail or over 65 — try half adult dose first — minimises respiratory depression and hypotension.

Side Effects
- Hypotension (can be severe) particularly in dehydrated patients.
- Lethargy and drowsiness.
- Extrapyramidal reaction.
- Anxiety and euphoria.
- Respiratory depression.

Precautions
- Administration to patients who have taken alcohol or other drugs may cause severe hypotension.
- Impaired level of consciousness.
- Elderly debilitated patients.
- Severe cardiovascular disorders.
- History of dystonic reactions.

Administration
- Restrain patient with minimum force necessary.
- Consider Midazolam as an alternative or additional agent.
- Prepare injection. Dilute to 1mg per ml with crystalloid if titrating smaller doses.
- Check with partner — correct medication and dose.
- Confirm patient still requires medication prior to administration.
- Record dose (in mg), route and time.
- Monitor and record Vital Signs and effects.
- If hypotensive, consider IV fluids.

Prepare Patient for Transport
- Patients must be prepared and transported without delay.
NORMAL SALINE 0.9%

Presentation
- Soft plastic pack containing 1000ml.

Pharmacology and Action
- Sterile isotonic crystalloid solution.

Primary Indication
- Fluid replacement for the treatment of shock.

Contraindication
- Evidence of circulatory overload, heart failure, pulmonary oedema.

Route of Administration
- Intravenous infusion.

Dose
- To keep vein open — 20 drops/minute or
- As volume replacement (see below).

**Adult** (bolus/fluid challenge), infuse 500mls reassess (pulse, BP and peripheral circulation). Continue regime of 500ml increments to a maximum of 2000ml.

**Small adult / elderly** (bolus/fluid challenge), infuse 250mls reassess (pulse, BP and peripheral circulation). Continue regime of 250ml increments to a maximum of 1000ml.

Cardiogenic shock
If patient is hypotensive with systolic < 90mmHg and does not have pulmonary oedema, administer fluid as per dose indication. Stop if patient becomes SOB.

Children
- IV fluid therapy is indicated for the treatment of shock. The primary objective is to restore intravascular volume and thus tissue perfusion.
- Administer 20ml/kg of isotonic crystalloid over 5 to 10 minutes.
- Repeat to a maximum of 2 boluses of 20ml/kg if required to restore BP and perfusion.
- Frequent reassessment during fluid resuscitation is essential.

Side Effects
- May cause circulatory overload if administered inappropriately.

Precautions
- As above.
- Ensure solution is clear, uncontaminated and in date.

Administration
- Prepare intravenous infusion.
- **Check** with partner — correct medication and dose.
- Record observations and times.

Prepare Patient for Transport
- Transport patient at once, do not delay to initiate treatment. If patient time critical and deteriorating, attempt treatment en route.
- Monitor — Vital Signs.
- Record — TREND, flow rate, total volume infused.
# FLUID RATES

<table>
<thead>
<tr>
<th>Full thickness burns</th>
<th>30%</th>
<th>60%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 10yrs (21 - 30kg)</td>
<td>60 dpm</td>
<td>120 dpm</td>
<td>180 dpm</td>
</tr>
<tr>
<td>11 - 15yrs (30 - 40kg)</td>
<td>90 dpm</td>
<td>180 dpm</td>
<td>240 dpm</td>
</tr>
<tr>
<td>Small Adult (50kg)</td>
<td>120 dpm</td>
<td>240 dpm</td>
<td>400 dpm</td>
</tr>
<tr>
<td>Adults (80kg)</td>
<td>200 dpm</td>
<td>400 dpm</td>
<td>600 dpm</td>
</tr>
</tbody>
</table>

Treat all blistered areas of burn as full thickness.
Medications
11.20 INTRAVENOUS GLUCOSE 10%
December 2010

Glucose 10%
Presentation
- 500ml bag of 10% Dextrose (Glucose)

Pharmacology and Action
- A hypertonic crystalloid solution of Glucose that provides a readily available source of energy (Glucose).
- Composition – Dextrose 10% and water.

Primary Indication
- Cardiac Arrest.
- First line management of hypoglycaemia in cardiac arrest.
- Second line-management of demonstrated hypoglycaemia in:
  - Altered conscious state in a known diabetic.
  - Altered conscious state of unknown medical cause, with suspicion of associated hypoglycaemia / Blood Sugar Level test of below 4mmol/L.

Contraindication
- No absolute contra-indications in the presence of true hypoglycaemia.
- Don’t administer intravenous Dextrose routinely during resuscitation unless suspected or proven hypoglycaemia is present.
- Don’t combine with sodium bicarbonate.

Route of Administration
- Intravenous infusion.

Dose (Adults)
- Second line-management. Only administered if full GCS not attained after 10 minutes from 1mg IMI Glucagon administration.
- 10g (100ml of a 10% solution) slowly IVI through a free flowing intravenous line (see preparation / administration).

Onset
Rapid onset approximately 1 minute.

Duration
- Duration depends on severity of hypoglycaemia episode.

Side Effects
- Hyperglycaemia, diuresis, local tissue necrosis (ensure IV patency), Thrombophlebitis (administer slowly).

Precautions
- Dehydration and hypovolaemia – must be corrected simultaneously with hypoglycaemia.
- High concentration of IV Dextrose result in an increase in osmolarity that moves water from the cells resulting in diuresis, therefore aggravating dehydration.
- Intracranial haemorrhage / CVA – glucose leaking into the CNS tissue will aggravate the injury and result in cerebral oedema. Careful titration of glucose in all head injured patients is vital.

Preparation / Administration
- Insert an IV cannula and set up a normal saline infusion. Ensure patency of IV.
- Ensure IV fluids are running.
- Check with partner – correct medication 10% Dextrose 10 500ml bag.
- Attach IV giving set of IV 10% Dextrose bag to the IV saline piggy-back port.
- Administer 100mls 10% Dextrose slowly whilst piggy-backed to IV saline infusion.
- Monitor all Vital Signs, conscious state, ECG and BSL where possible.
- Record medication administration time and results on Patient Care Record form.

Prepare Patient for Transport
- Patient must be prepared and transported without delay.
Medications
11.21A ISOSORBIDE DINITRATE (ISORDIL)
April 2011

Isosorbide Dinitrate (Isordil)

Presentation
- 5mg small pale pink sublingual tablet.

Pharmacology and Action
- Rapid vasodilating effect.
- Vasodilatation (reduced afterload).
- Pools venous blood.
- Reduces myocardial workload.
- Decreases cardiac output.
- Decreases cardiac oxygen consumption.
- Relaxes spasm of coronary arteries.

Primary Indication
- Chest pain of presumed cardiac origin, not relieved by rest, Oxygen and reassurance, with systolic BP > 90mmHg
- Acute Cardiac Pulmonary Oedema, with systolic BP > 160mmHg.

Contraindication
- Known hypersensitivity to nitrates.
- Hypotension <90mmHg.
- Concurrent or previous use of medications used for erectile dysfunction within 24 hours (eg: Sildenafil®, Vardenafil®).

Route of Administration
- Sublingual.

Dose
- 5mg (1 tablet) sublingually.
- Chest pain, if pain still a problem after 5 minutes and BP maintained, consider another tablet to a maximum of 3 tablets in 15 minutes.

- Acute cardiogenic pulmonary oedema, repeat after 5 minutes up to a maximum of 3 tablets in 15 minutes if necessary. Cease if BP falls below 140mmHg.
- For long transport times, further doses of Isordil 5mg may be given every 30 minutes where indicated and criteria met.

Children
- Not applicable.

Onset
- 1-5 minutes: duration 30 minutes.

Side Effects
- Hypotension and Tachycardia.
- Flushing and headache.

Precautions
- Care in elderly or if never had nitrites.
- In acute myocardial ischaemia watch for hypotension.
- Remove tablet if necessary.

Administration
- Check with partner — correct medication and dose.
- Give Isordil tablet to place under tongue.
- Monitor BP, Vital Signs and ECG.
- Remove tablet if severe hypotension or severe headache.
- Record dose, times, effects.

Prepare Patient for Transport
- Patient must be prepared and transported without delay.
- Do not wait for medication to take effect.
Medications

11.21B GLYCERYL TRINITRATE (NITROLINGUAL®)

April 2011

Glyceryl Trinitrate (Nitrolingual®)

Presentation
- Spray bottle containing 200 x 0.4mg atomized sprays.

Pharmacology and Action
GTN causes relaxation of vascular smooth muscle resulting in:
- Peripheral pooling.
- Reduced venous return.
- Reduced left ventricular and diastolic pressure (preload).
- Reduced systemic vascular resistance (afterload).
- Reduced myocardia energy and oxygen requirements.

Primary Indication
- Chest pain of presumed cardiac origin, not relieved by rest and Oxygen with systolic BP > 90mmHg.
- Acute Pulmonary Oedema with systolic BP > 160mmHg.

Onset and Duration
- 1-3 minutes.
- Duration of action 30-60 minutes.

Precautions
- Do not shake bottle prior to administration.
- The medication should not be inhaled.

Administration
- Patient must be seated or in semi recumbent position for administration.
- Administer spray sublingually.
- Assess BP after every dose.
- Record dose, times, effects.

Route of Administration
- Sublingual.

Contraindication
- Known hypersensitivity to nitrates.
- Hypotension <90mmHg.
- Concurrent or previous use of medications used for erectile dysfunction with 24 hours (e.g. Sildenafil®, Vardenafil®).

Dose

Chest pain
- 0.4mg sublingually repeated after 5 minutes to a maximum of 3 doses.

Acute cardiogenic Pulmonary Oedema
- 0.4mg sublingually repeated after 5 minutes to a maximum of 3 doses. Cease administration if systolic BP drops below 140mmHg.

Side Effects
- Hypotension.
- Tachycardia.
- Flushing.
- Headache.
Midazolam (Hypnovel)

Presentation
- Ampoules of 3mls — thick oily clear liquid. 5mg/ml.
- May require dilution of 10mg to 10ml in crystalloid.
- Water-soluble benzodiazepine with a short half-life (2-3 hours).

Pharmacology and Action
- Anticonvulsant and central nervous system sedative. Highly lipophilic, therefore has a rapid onset of action and short duration.

Primary Indication
- Unconscious associated with repeated or prolonged generalised seizure activity
- IM injection is easier and more rapidly administered than IV in a fitting patient.
- If the seizure activity is due to hypoxia or the patient is known diabetic manage the cause first then administer Midazolam if necessary.

Other Indication
- For sedation in patients who are violent or aggressive, and at danger of harming themselves or others and requiring restraint.
- Intravenous sedation for the purpose of performing procedures.

Contraindications / Precautions
- Onset of action prolonged when circulation impaired e.g. shock, CHF.

Route of Administration
- Intravenous injection.

Dose — Adult
- 2.5-5mg boluses titrated to effect every 2-5 minutes to maximum 20mg.
- If small, frail or over 65 — try half adult dose first — minimises respiratory depression.

Children
- Up to 20 kg 0.5-1mg boluses.
- > 20kg large child 1-2mg boluses.

Precautions
- Beware hypotension, increased sensitivity and delayed onset in hypovolaemic patients.

Onset
- 1-5 minutes, depending on circulatory status.

Side Effects
- Potential for respiratory depression and hypotension especially if hypovolaemic.

Administration
- Prepare injection. Dilute to 1mg per ml with crystalloid if titrating smaller doses.
- Check with partner — correct medication and dose.
- Confirm patient still requires medication prior to administration.
- Record dose (in mg), route and time.
- Monitor and record Vital Signs and effects.

For Sedation
- Consider Haloperidol as an alternative or additional agent.
Medications
11.23 KETAMINE
August 2008

Ketamine Hydrochloride
Presentation
- 200mg/2ml.
- Ketamine is freely soluble in water and methylalcohol and is soluble in alcohol.

Pharmacology and Action
- Rapid-acting, dissociative anaesthetic.
- Produces a ‘dissociative state’ characterised by a trance like state with eyes open but not responsive, nystagmus, profound analgesia, normal pharyngeal-laryngeal reflexes, normal or slightly enhanced skeletal muscle tone, mild cardiovascular and respiratory stimulation, and occasionally, a transient and minimal respiratory depression.

Primary Indication
- Severe unrelieved pain (after use of either Methoxyflurane and/or Fentanyl) of traumatic origin e.g. burns, long bone fractures.
- Ketamine is a second line agent when other agents have not been effective.

Route of Administration
- Adults: intravenous or intramuscular.
- Children: intramuscular only.

Dose
Intramuscular route:
- 200mg in 2ml = 100mg/ml
- Initial: 1 mg/kg.
- Repeat: 0.5 mg/kg (half initial dose).
- Interval: 5 to 10 minute intervals as needed.

Onset
The onset of action of Ketamine is rapid:
- 1 minute following an IV dose.
- 5 to 10 minutes following an IM dose.

Side Effects
- Blood pressure and pulse rate are frequently mildly elevated.
- Hypersalivation (~10%).
- Unpleasant emergence reactions (up to 10%, more common in adults).
- Transient laryngospasm (10 times more common with URTI).
- Transient apnoea or respiratory depression (very uncommon).
- Random purposeless movements, muscle twitching and rash are common.

Contraindications
- Age < 3 months.
- Pain from cardiac or other non-traumatic origin.
- Active cardiovascular disease including cardiac chest pain, heart failure, severe or poorly controlled hypertension.
- Active psychiatric condition.

Precautions
- Where a significant elevation of blood pressure would be hazardous e.g. history of stroke, cerebral trauma, intracerebral mass or haemorrhage.
- Patients with hyperthyroidism or patients receiving thyroid replacement (increased risk of hypertension and tachycardia).
- Patients with intracranial mass lesions, a presence of head injury, globe injuries, or hydrocephalus.
- Should be used with caution in patients with stable psychiatric disorders such as schizophrenia.

Administration
- For intravenous titration dilute to a total volume of 20 ml with crystalloid = 10mg/ml.
- Each intravenous dose should be flushed with crystalloid.
- All doses (in mg), time and route of administration must be documented on PCRF and the Ketamine data sheet.
Medications

11.24 LIGNOCAINE 1% (XYLOCAINE)

July 2011

Lignocaine 1%
Plain (XYLOCAINE)

Presentation
- 20mg in 2mls — 1% ‘plain’.

Pharmacology and Action
- Local anaesthetic, injected intradermally.

Primary Indication
- Used, if time and circumstances permit, to provide pain free skin penetration when attempting venous cannulation.
- To provide local anaesthesia for suturing.
- To provide local anaesthesia for IO infusion.

Contra Indication
- Allergy to Lignocaine.

Route of Administration
- Intradermal.
- Use 1ml syringe.

Dose
- Rice-grain size 'bleb'.
- May be repeated at a second site if needed.

For IO infusion
- Infuse Lignocaine IO for alert patients:
  - Adults 4ml 1% Lignocaine = 40mg
  - Small adult / large child 2ml 1%
    Lignocaine = 20mg
  - Small child 1ml 1% Lignocaine = 10mg.

Onset and Duration
- 1-2 minutes.
- Half-life — N/A.

Side Effects
- Slight needle discomfort.

Administration
- Select vein site, prepare skin.
- Clean skin.
- Insert needle, bevel up, almost parallel to skin.
- When bevel just in skin, raise white 'intradermal bleb' by injecting 0.1ml slowly.

Cannulate
- As per CPG’s and skill.

Precautions
- Beware needle-stick injury.
Medications
11.25 METHOXYFLURANE
August 2008

Methoxyflurane

Presentation
- 3mls clear fluid in sealed screw top ampoule.
- Strong fruity smell, even at low concentrations.
- Dissolves many plastics.

Pharmacology and Action
- A halogenated ether.
- As provided, produces powerful modification of awareness of pain, with associated light headed sensation.
- May produce drowsiness.
- Effectiveness varies, as with all analgesics, but efficacy improves with the skill of the administrator.

Primary Indication
- Pain (eases discomfort rather than total pain relief.)

Contraindication
- Patients who are unable to understand or co-operate.
- Patients with severe renal impairment.
- Patients with head injury and altered consciousness that prevents co-operation with use.
- Have a known sensitivity i.e. malignant hyperthermia.

Route of Administration
- By inhalation via Penthrox™ inhaler only.

Dose
Adults
- Initial dose 1 x 3ml ampoule.
- Max. 6ml / day or 15ml / week.
- May be repeated once after 15 minutes if still in severe pain or pain returns.
- Do NOT load inhaler with more than 3mls at once. There is NO advantage in giving double the dose (i.e. 2 ampoules).
- There is a risk of inhaling droplets or fluid, and resultant serious overdose.
- May be slow onset and prolonged effect in elderly — administer with care.

Children
- As per adults.
- A second dose is rarely needed in children.

Onset
- 6 to 8 breaths/1-2 minutes, maximum level 2-4 minutes after commencement of inhalation.

Side effects
- Initially, catches breath.
- Prolonged use — light headed, dizzy, drowsy, occasional nausea.

Precautions
- Initial breath is strong. Take gently.
- Thereafter easy to breathe.
- Watch for drowsiness — discontinue if this occurs (elderly and children especially).
- Maintain voice contact.
- May be slow onset and prolonged effect in elderly — administer with care.

Administration
- Patient should self administer.
- May be assisted.
- Must be supervised.
- Check with partner — correct medication and dose.
- Empty prescribed dose into inhaler (Penthrox™). Adding Activated carbon filter optional.
- If O₂ required deliver separately by mask.
- Cover air dilutor hole, whenever practical, for maximum effect.
- Attach to resuscitation mask if required.
- Must have Oxygen attached.
- Use intermittently – as required.
- May be placed in plastic bag when not in use to prolong effective life.

Prepare Patient for Transport
- Do not delay transport. Analgesic effect commences in 1-2 minutes, lessens 5-6 minutes after administration is stopped.
Metoclopramide “Maxolon”

Presentation
- 10mg in 2ml ampoule.

Pharmacology
- An anti-emetic.
- Accelerates gastric emptying and peristalsis.

Metabolism
- By the liver and excreted by the kidneys.

Primary Emergency Indications
- Nausea and vomiting associated with pain and/or GI disturbance.
- Prophylaxis in penetrating eye injuries.

Precautions
- Children < 12 years of age.

Route of Administration
- Intravenous.
- Intramuscular.

Dose
- 10mg IV / IM.
- May be repeated after 10-20 minutes if ineffective.

Side Effects
- Drowsiness.
- Lethargy.
- Dry mouth.
- Muscle tremor.
- Extrapyramidal reactions, including restlessness and dystonia.

Special Notes
- Not effective for established motion sickness.
- Not effective for prevention of nausea/vomiting associated with opiate use.

Onset and Duration
Intravenous Effects:
- Onset: 3-5 min.
- Peak: 10-15 min.
- Duration: 30-60 min.
Midazolam (Hypnovel)

Presentation
- Ampoules of 3mls — thick oily clear liquid. 5mg / ml.
- Water-soluble benzodiazepine with a short half-life (2-3 hours).

Pharmacology and Action
- Anticonvulsant and central nervous system sedative. Highly lipophilic, therefore has a rapid onset of action and short duration.
- Damage in seizure, is due to hyperthermia, hypoxia, hypoglycaemia, and severe metabolic acidosis.
- IM injection is easier and more rapidly administered than IV in a fitting patient.
- If the seizure activity is due to hypoxia or the patient is known diabetic manage the cause first if practical, then administer Midazolam if necessary.

Primary Indication
- Unconscious associated with repeated or prolonged generalised seizure activity (preventing adequate oxygenation) lasting more than 10 minutes, which may lead to brain damage.

Other Indication
- For sedation in patients who are violent or aggressive, and at danger of harming themselves or others and requiring restraint, e.g. patients suffering hallucinations and paranoia or presumed drug effects.
- Sedation is only to be used as a last resort to get patients to hospital safely when all other options (e.g. negotiation) in such situations is ineffective. In all cases, organic causes such as hypoxia and hypoglycaemia must be excluded or treated as soon as possible.
- Back pain associated with musculo-skeletal spasm.

Contraindication
Sedation not indicated for children.

Route of Administration
Intramuscular injection.

Dose

Adult
- 10mg in 2ml.
- If small, frail or over 65 — try half adult dose first — minimises respiratory depression.

Children
- Up to 20 kg 2.5mg in 0.5ml.
- > 20kg large child 5mg in 1ml.
  A Further dose may be given after 20 minutes if seizures recur or continue.

Back pain
Adult 2.5-5mg.

Onset
- 1-5 minutes, depending on rate of absorption from muscle.

Side Effects
- Potential for respiratory depression, especially in adult. Be prepared to ventilate patient briefly if needed.

Administration
- Prepare injection.
- Check with partner — correct medication and dose.
- Confirm patient still fitting OR requiring medication.
- Administer medication.
- Record dose (in mg) and time.
- Monitor and record Vital Signs and effects.
- Check Blood Sugar level and record. If hypoglycaemic, give Glucagon.

For Sedation
- Consider Haloperidol as an alternative or additional agent.

Prepare Patient For Transport

Seizures:
- Patient must be prepared and transported without delay.
- Do not wait for medication to take effect.
- If likely to be febrile fits, prevent overheating.
- Conscious children may be given Syrup of Paracetamol (according to manufacturers' instructions) by parent.
Morphine Sulphate

Presentation
- 10mg in 1ml ampoule.

Pharmacology
- A narcotic analgesic.
- Central Nervous System effects:
  - Analgesia.
  - Depression of conscious state.
  - Respiratory depression.
  - Depression of cough reflex.
  - Stimulation — changes of mood, euphoria or dysphoria, vomiting, pinpoint pupils.
  - Dependence (addiction).
- Cardiovascular effects:
  - Vasodilatation.
  - Decreases conduction velocity through the AV Node.
- Histamine release:
  - Rash.
  - Itch.
  - Hypotension.

Metabolism
- By the liver and excreted by the kidneys.

Primary Emergency Indications
- Cardiogenic Pulmonary Oedema.
- Analgesia.
- Sedation to maintain intubation.

Contraindications
- Known hypersensitivity.
- Late second stage of labour.

Precautions
- Elderly patients.
- Hypotension.
- Respiratory depression.
- Current asthma.
- Respiratory tract burns.
- Known addiction to narcotics.
- Acute alcohol / drug intoxication.
- Patients on monoamine oxidase inhibitors.

Route of Administration
- Intravenous.
  - IV infusion – refer to Sedation to Enable Endotracheal Intubation CPG.

Side Effects
- Central Nervous System effects:
  - Drowsiness.
  - Respiratory depression.
  - Euphoria.
  - Nausea, vomiting.
  - Pinpoint pupils.
  - Addiction.
- Cardiovascular effects:
  - Hypotension.
  - Bradycardia.
- Histamine release:
  - Rash.
  - Itch.
  - Hypotension.

Dose
Adult
- 5 -10mg IM.
- 2 - 10mg IV (titrate to response).
- Maximum dose 30mg in 1 hour (this may be exceeded only after consultation with a medical Officer).

Child
- 0.1 - 0.2mg/kg IM.
- 0.05 - 0.1mg/kg IV (titrate to response).
- Maximum dose 0.4mg/kg (this may be exceeded only after consultation with a medical Officer).
- Do not exceed 20mg.

Onset and Duration
Intravenous Effects:
- Onset: 2 - 5 min.
- Peak: 10 min.
- Duration: 1 - 2 hours.

Intramuscular Effects:
- Onset: 10 -30 min.
- Peak: 30 - 60 min.
- Duration: 1 - 2 hours.

Special Notes
- Side effects of Morphine Sulphate can be reversed with Naloxone Hydrochloride.
Medications

11.29 NALOXONE (NARCAN)
March 2010

Naloxone (Narcan)
Presentation
- 0.4mg in 1.0ml in 1ml ampoule.

Pharmacology and Action
- Naloxone is a pure narcotic antagonist that exerts its effect by competitive inhibition at the opioid receptor sites. It prevents or reverses the effects of opioids, including respiratory depression, sedation and hypotension. In the absence of opioids it exhibits essentially no pharmacological activity.

Indication
Note: The only therapeutic goal is to reverse any respiratory depression in a suspected narcotic overdose, and not to fully awaken such patients, who may become violent should acute withdrawal occur.
- Unconscious patient with evidence of narcotic over dose (e.g. Pin-point pupils etc) with respiratory depression such as ineffective respirations and / or signs of hypoxia.
- Cardiac Arrest post suspected opioid overdose to address potential correctable cause. Effective CPR should not be interrupted to administer drug.

Contra Indication
- Responsive patients with adequate respirations and who are protecting their own airway.

Route of Administration
- Intramuscular (Deltoid or mid lateral thigh).
- Intravenous.

Dose
Adults
- IMI: 0.4mg repeat every 5 – 10 minutes up to 2mg.
- IVI: 0.04mg (40mcg) increments every 2 minutes titrated to effect up to 2mg. (0.4mg/1ml dilutes to 10mls = 0.04mg/ml).
- Cardiac Arrest post suspected opioid OD: 2mg in 5mls IV once only.

Children
- 0.4mg IMI only, repeat 5 – 10 minutes up to 2mg.

Onset and Duration
- IVI: 0 – 2 minutes
- IMI: 5 – 15 minutes
- Half – life 30 – 60 minutes

Side Effects
- Withdrawal symptoms e.g. aggression, agitation, nausea, vomiting, dilated pupils, lacrimation.

Precautions
- Known or suspected Naloxone hypersensitivity.
- Rule out other causes of unconsciousness.
- Probability of slow response due to multiple substances with variable half – lives e.g. alcohol, benzodiazepines, long acting narcotics e.g. methadone 9half – life 12 hours).
- Naloxone has no effect on non-narcotic induced respiratory and CNS depression.
- Half – life may be less than narcotic dose.
- Should 2mg fail to obtain the desired response, then overdose with agents other than opioids should be considered.

Administration
- Clear airway, ventilate 100% Oxygen for at least 3 – 5 minutes prior to Naloxone administration.
- Prepare medication
- Check with partner-correct medication and dose.
- Administer IM / IV injection.
- Maintain ventilations with 100% Oxygen.
- Record dose and time.
- Monitor Vital Signs, effects and record.

Prepare Patient for Transport
- Patients must be prepared and transported without delay.
- Do not wait for drug to take effect.
Presentation
- Ibuprofen 200mg.
- Ibuprofen 200mg + Codeine 12.8mg (See Codeine guideline as well).
- Mefenamic Acid 250mg.

Pharmacology and Action
- Ibuprofen possesses analgesic, antipyretic and anti-inflammatory properties. Its mechanism of action is unknown, but is thought to be through peripheral inhibition of cyclo-oxygenases and subsequent prostaglandin synthetase inhibition.

Primary Indication
- Fever (pyrexia), inflammation (anti-inflammatory), and mild to moderate pain (especially where inflammation is present).

Contra Indication
- Known hypersensitivity or idiosyncratic reaction to Ibuprofen (or any of the other ingredients in the product)
- Known hypersensitivity to aspirin and other NSAIDs
- Asthmatic that is aspirin or NSAID sensitive
- Active gastrointestinal bleeding or peptic ulceration
- Pregnant patients.

Route of Administration
- Oral.

Dose
**Ibuprofen (Nurofen)**
- Adults and children over 12 years of age: initial dose 2 tablets, then 1-2 tablets every 4-6 hours (maximum 6 per 24 hours).
- Children (7 - 12 years of age): 1 tablet every 4-6 hours if necessary (maximum 4 per 24 hours).

**Ibuprofen + Codeine (Nurofen Plus)**
- Adults and children from 12 years: 2 tablets, then 1 or 2 tablets every 4 hours as necessary (maximum 6 tablets in 24 hours).
- Not for children under 12 years.

**Mefenamic Acid (Ponstan)**
- Adults: 2 Tablets 3 times a day with meals.
- Not for children under 14 years.

Side Effects
- Nausea, Heartburn, Stomach ulcers, Diarrhoea, stomach cramps.
- Drug Interactions:
  - Anticoagulants, including Warfarin – ibuprofen interferes with the stability of INR and may increase risk of severe bleeding and sometimes fatal haemorrhage, especially from the gastrointestinal tract.
  - Ibuprofen should only be used in patients taking Warfarin if absolutely necessary and they must be closely monitored.
  - Ibuprofen may decrease renal clearance and increase plasma concentration of lithium
  - Ibuprofen may reduce the anti-hypertensive effect of ACE inhibitors, beta-blockers and diuretics and may cause natriuresis and hyperkalemia in patients under these treatments
  - Ibuprofen reduces methotrexate clearance
  - Ibuprofen may increase plasma levels of cardiac glycoside

Precautions
- Ibuprofen should be used with caution in patients with:
  - Previous history of gastrointestinal haemorrhage or ulcers
  - Asthma who have not previously taken an NSAID
  - Hepatic, renal or cardiac impairment.
  - Age over 65 years due to increased chance of side effects.
  - Should not operate heavy machinery or drive if taking codeine.

Administration
- Check with partner-correct medication and dose.
- Give orally, with water to swallow
Ondansetron

Presentation
- Ampoule of 4mg Ondansetron (hydrichlorise dihydrate) in 2mls of clear aqueous solution.

Pharmacology and Action
- Anti-nauseant and anti-emetic.
- Selective 5-HT3 receptor antagonist blocking serotonin centrally in the chemoreceptor trigger zone and peripherally on Vagus nerve terminals.

Primary Indication
- Moderate to severe nausea.
- Active vomiting.
- Prophylaxis nausea / vomiting in eye or spinal injured patients.

Contra Indications / Precautions
- Children less than 2 years old.
- Known hypersensitivity to Ondansetron.

Route of Administration
- Intramuscular injection.
- Intravenous injection.

Dose
Adults
- 4mg in 2ml IM or slow IV.
- Repeat the dose after 30 minutes if little or no effect.

Children (single dose only)

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 years</td>
<td>1mg in 0.5mls</td>
</tr>
<tr>
<td>6-9 years</td>
<td>2mg in 1ml</td>
</tr>
<tr>
<td>10-12 years</td>
<td>3mg in 1.5mls</td>
</tr>
<tr>
<td>&gt;12 years or &gt;40kg</td>
<td>4mg in 2mls</td>
</tr>
</tbody>
</table>

Onset of action
- Up to 30 minutes

Side Effects
- More common – headache, malaise / fatigue.
- Less common – drowsiness, dizziness, rash, allergic reaction.

Preparation / Administration
- Record nausea score (out of 10 and/or presence of vomiting prior to administration.
- Monitor all Vital Signs including conscious state.
- Check with partner – correct medication and dose.
- Prepare injection site – mid antero-lateral thigh or Deltoid muscle.
- Administer intramuscular injection.
- Intravenous injection – administer a flush to ensure patency of IV site.
- Administer IV Ondansetron slowly over 2 minutes (neat or diluted) to prevent blurred vision and dizziness.
- Flush with normal saline after dose has been administered.

Documentation
- Record medication administration time on Patient Care Record Form.
- Monitor – Vital Signs, effect and record.
- Record subsequent nausea scores (out of 10) and vomiting.
- Document effectiveness’ of medication.

Prepare Patient for Transport
- Patients must be prepared and transported without delay.
- Do not wait for drug to take effect.
PRESENTATION

- Ampoule of 4mg Ondansetron (hydrichlorise dihydrate) in 2mls of clear aqueous solution.
- 4mg Oral wafers.

PHARMACOLOGY AND ACTION

- Anti-nauseant and anti-emetic.
- Selective 5-HT3 receptor antagonist blocking serotonin centrally in the chemoreceptor trigger zone and peripherally on Vagus nerve terminals.

PRIMARY INDICATION

- Moderate to severe nausea.
- Active vomiting.
- Prophylaxis nausea / vomiting in eye or spinal injured patients.

CONTRA INDICATIONS / PRECAUTIONS

- Children less than 2 years old.
- Known hypersensitivity to Ondansetron.

ROUTE OF ADMINISTRATION

- Intramuscular injection.
- Intravenous injection.
- Oral (wafer only).

DOSE

ADULTS

- 4mg in 2ml IM or slow IVI.
- Repeat the dose after 30 minutes if little or no effect.
- Oral 8mg, repeat once after 12 hrs.

CHILDREN (single dose only)

- Oral: 4 – 11 years = 4 mg / 8 hrs.
- IM (Single dose only):

<table>
<thead>
<tr>
<th>Age</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 years</td>
<td>1mg in 0.5ml</td>
</tr>
<tr>
<td>6-9 years</td>
<td>2mg in 1ml</td>
</tr>
<tr>
<td>10-12 years</td>
<td>3mg in 1.5ml</td>
</tr>
<tr>
<td>&gt;12 years or &gt;40kg</td>
<td>4mg in 2ml</td>
</tr>
</tbody>
</table>

SIDE EFFECTS

- More common – headache, malaise / fatigue.
- Less common – drowsiness, dizziness, rash, allergic reaction.

ONSET OF ACTION

- Up to 30 minutes

PREPARATION / ADMINISTRATION

- Record nausea score (out of 10) and/or presence of vomiting prior to administration.
- Monitor all Vital Signs including conscious state.
- Check with partner – correct medication and dose.
- Prepare injection site – mid antero-lateral thigh or Deltoid muscle.
- Administer intramuscular injection.
- Intravenous injection – administer a flush to ensure patency of IV site.
- Administer IV Ondansetron slowly over 2 minutes (neat or diluted) to prevent blurred vision and dizziness.
- Flush with normal saline after dose has been administered.
- Place wafer on tongue of patient, allowing it to dissolve.

DOCUMENTATION

- Record medication administration time on Patient Care Record Form.
- Monitor – Vital Signs, effect and record.
- Record subsequent nausea scores (out of 10) and vomiting.
- Document effectiveness’ of medication.

PREPARE PATIENT FOR TRANSPORT

- Patients must be prepared and transported without delay. Do not wait for drug to take effect.
Medications
11.31 PARACETAMOL
August 2008

Paracetamol

Presentation:
- 500mg tablets.
- 125mg / 5ml suspension.

Pharmacology and Action:
- Simple oral analgesia for relief of mild to moderate pain and fever.

Primary Indication:
- Headache.
- Minor pain / ache.
- Fever.

Contraindications:
- Known allergy to paracetamol.
- Paracetamol during the preceding four hours.

Route of Administration:
- Oral use only.

Dose:
- Adults: 1-2 tablets with water.
- Children: (7-12 years) 0.5-1 tablet.
- Children: (< 7 years) as per directions on the bottle.

Onset:
- 20-30 minutes.

Side Effects:
- Nil known at therapeutic doses.

Precautions:
- Advise not to take more Paracetamol during the next 4 hours.
- Overdose may cause serious, potentially fatal liver damage.

Administration:
- As per directions in packaging.
- If possible determine the child’s weight.
- Identify any allergies.
- Measure and record, pulse, respiration rate and blood pressure.
- Record dose and time given.
Promethazine (Phenergan)

Presentation
- 25mg in 1 ml ampoule.
- 50mg in 2ml ampoule.

Pharmacology
- Promethazine is a long acting H1 blocker with mild Atropine like anticholinergic effects.

Action
- Antihistamine.
- Antiemetic.
- Sedative.

Metabolism
- By the liver.

Primary Emergency Indications
- Motion sickness.

Contraindications
- Known severe adverse reaction.

Precautions
- Children < 6 years of age.
- May potentiate the effects of alcohol.
- Not to be given subcutaneously and extra care taken to avoid intra-arterial injection.
- History of dystonic reactions.

Route of Administration
- Deep intramuscular injection.
- Intravenous injection (slowly).

Side Effects
- Dry mouth.
- Restlessness — dizziness — poor coordination.
- Blurred vision.
- Sedation.
- Cough.

Dose
Adult
- 12.5mg IV (give over at least two minutes).
- 25mg to 50mg deep IM.

Child > 6 Years
- 0.25mg (250mcg) / kg IM or IV.

Onset and Duration
Intramuscular.
- Onset: 20 min.
- Peak: 30 min
- Duration: 2-8 hours.

Intravenous
- Onset: 5-10 min.
- Peak: 30 min.
- Duration: 2-8 hours.
Rocuronium Bromide “Esmeron”

Presentation
- 100mg in 10ml ampoule.

Pharmacology
- A non-depolarising neuromuscular blocking agent.
- Blocks transmission of impulses at the neuromuscular junction of striated muscles resulting in skeletal muscle paralysis.
- Due to weak vagolytic action, a slight rise in pulse rate and mean arterial pressure may be expected.
- Histaminoid reactions may produce rash and/or hypotension.

Metabolism
- By the kidneys and excreted mainly unchanged in the urine.

Primary Emergency Indications
- To maintain skeletal muscle paralysis and allow mechanical ventilation in intubated patients.

Contra-Indications
- Rocuronium must not be given if continuous monitoring of patient Vital Signs including pulse oximetry and end tidal CO₂ monitoring are not available.
- Status Epilepticus.

Precautions
- Ensure patency of IV access.
- Sedatives should always be administered prior to Rocuronium Bromide.
- Endotracheal tube placement, adequacy of ventilation, oxygen saturation, end tidal CO₂, pulse and blood pressure must be continuously monitored.
- Patients with myasthenia gravis should be given much smaller doses and monitored carefully due to the potential of increased degree of neuromuscular block.
- Care should be exercised in patients with renal impairment.

Route of Administration
- Intravenous.

Side Effects
- Slight increase in heart rate.
- Histaminoid reactions may produce rash and/or hypotension.

Dose
- Initial dose: 0.6mg/kg (usually 50mg in adults).
- Maintenance doses: 0.1-0.2mg/kg.
- Infusion: 0.3-0.6mg/kg/hr.

Onset And Duration
- Onset: 2-3 min.
- Peak: 8-10min.
- Duration: Dose related. 35-45 min for 0.1mg/kg.

Special Notes
- Allergic reactions such as urticaria, laryngeal oedema, bronchospasm, and anaphylactic shock have been reported.
- Rocuronium Bromide infusions required during interhospital transfers are to be prescribed and signed by an authorised medical Officer. The infusion rate is usually 0.3-0.6mg/kg/hr.
Salbutamol Sulphate  
(Ventolin)

**Presentation**
- Plastic “Nebule” — 5mg in 2.5ml.
- Tone blue Multi Dose Inhaler (MDI).

**Pharmacology and Action**
- Sympathomimetic — a synthetic beta 2 adrenoreceptor stimulant.
- Relaxation of bronchial smooth muscle (bronchodilation).
- Salbutamol is metabolised hepatically and excreted renally.

**Primary Indication**
- Bronchospasm, Respiratory Distress associated with wheeze:
- Acute Bronchial Asthma.
- Bronchitis.
- Smoke inhalation.
- Severe allergic / anaphylactic reactions.
- Acute Pulmonary Oedema of non-cardiac origin.
- Salt Water Aspiration Syndrome (SCUBA divers).
- Chronic Airway Limitation (CAL).

**Contraindication**
- No known contraindications in the above indications, except known hypersensitivity to Ventolin.

**Route Of Administration**
- Nebulised.
- Via MDI / space chamber.

**Nebulised Dose**
- One ‘Nebule’ (5mg in 2.5ml). May be repeated or continuous, if no effect.

**Children**
- As for adults.

**Onset**
- Initial effect 2-5 minutes maximum by 10 minutes.

**MDI / space chamber dose**

**Adult and Child**
- Initial dose 4 puffs. Encourage holding their breath for 5 to 10 seconds with each puff or 4 normal breaths between each puff.
- If patient has not improved continue 4 puffs with 4 breaths each every 4 minutes until improved.

**Side Effects**
- Muscle tremor (common).
- Tachycardia (rare).

**Precautions**
- No specific precautions.

**Administration**
- Check with partner — correct medication and dose.
- Peak flow if possible.
- MDI via space chamber one puff per dose.
- Nebulise in 8 L/min Oxygen.
- Monitor condition, wheeze, pulse, BP, cyanosis, chest retraction, distress.
- Treatment repeated until patient improves — no longer significantly breathless, or until reaching hospital.
- **Note:** if pulse sustained >150/min, continue Salbutamol carefully if patient remains critical.
- Record dose (in mg or number of puffs) and time.
- Monitor and record Vital Signs, peak flows and other effects.

**Prepare Patient for Transport**
- Patient must be prepared and transported without delay.
- Do not wait for medication to take effect.
- **Note:** No other substance is to be administered in the nebuliser.
Suxamethonium Chloride

Presentation
- 100mg in 2ml ampoule.

Pharmacology
- Depolarising neuromuscular blocking agent.

Actions
- Short acting muscular relaxant.

Metabolism
- Pseudo-cholinesterase in plasma.

Primary Emergency Indications
- For profound muscle relaxation to allow endotracheal intubation.

Contra-Indications
- Upper airway obstruction.
- Severe respiratory distress.
- Penetrating eye injury.
- High serum potassium e.g. renal failure.
- Organophosphate poisoning
- Ruptured Abdominal Aortic Aneurysm.
- Conditions associated with marked potassium rise after administration.
  - Burns after 24 hours.
  - Unresolved spinal conditions e.g. paraplegia, Guillain-Barre syndrome.
- Malignant hyperthermia.
- Known Suxamethonium apnoea.

Dose
- Usual dosage 2mg / kg IV.

Precautions
- Liver disease.
- Elderly patients.
- Patients that have not fasted.
- Airway trauma.
- Familial history of Suxamethonium apnoea.
- Familial history of malignant hyperthermia.

Route of Administration
- Intravenous.

Side Effects
- Muscular fasciculations.
- Increase in intraocular pressure.
- Increase in intragastric pressure.
- Elevated serum potassium levels.
- Bradycardia.

Special Notes
- Atropine should be administered prior to Suxamethonium administration if bradycardic (pulse <60 bpm).
- A second dose of Suxamethonium usually causes profound bradycardia.
- Sedation is required prior to use in conscious patients.
CLINICAL PRACTICE GUIDELINES
Infection Control Policy

ST JOHN AMBULANCE AUSTRALIA (Western Australia) Inc
Pre –Employment Screening

All Ambulance Officers should be assessed pre-employment to exclude a history of potentially infectious diseases. A thorough medical questionnaire is assessed and further medical examination may be required.

Immunisation

- Each ambulance staff member has a responsibility to ensure their immunisation status is current and appropriate.
- All Officers are invited to participate in the immunisation program and are offered Hep B and Tetanus immunisation (if non-immunised) and annual ‘flu’ vaccinations.
- Any staff member who wishes to have vaccinations should contact their Line Manager or the Human Resources Department to organise the procedure.

Pregnant Staff

Infectious Diseases Guidelines

- Pregnant staff can come into contact with agents that can cause congenital syndromes in the foetus when primary infection is acquired during pregnancy. Adherence to Standard and Additional Precautions, vaccinations and general infection control practices in the workplace should protect pregnant staff.
  - Pregnant staff should avoid contact with patients who are infected with the following:
    - Parvovirus.
    - Cytomegalovirus (CMV).
    - Varicella Zoster virus – Chickenpox and Shingles.
    - Rubella.
- Female personnel of childbearing age are encouraged to discuss immunisation for vaccine preventable diseases with their general practitioner prior to pregnancy.
- In health care settings, the most likely exposures are to Cytomegalovirus (CMV), Rubella, Varicella Zoster and Parvovirus B19. The risks are largely theoretical as there have been very few recorded cases of infection during pregnancy by these viruses within health care settings.
- The additional precautions for these 4 agents are outlined below. It is not meant to be a comprehensive account of all infections having relevance to pregnant women.
Cytomegalovirus (CMV)
Many women of childbearing age have already been exposed to CMV and developed acquired immunity. As infection is common in the community, staff can expect to regularly encounter people excreting CMV either at work or outside work. The highest risk of contact will occur in areas dealing with young children or severely immuno-compromised patients. Standard Precautions are adequate to prevent transmission.

Rubella
It is recommended that all women contemplating pregnancy are tested for immunity to Rubella and are revaccinated if necessary before becoming pregnant.

Varicella Zoster virus (as Chickenpox or Shingles)
Pregnant staff should not have contact with patients who have chickenpox or shingles unless they are known to have been previously exposed to the Varicella Zoster virus. (i.e. they have a definite history of chickenpox or shingles, or they have a positive antibody test).

Parvovirus B19
This is largely an infection of children up to 10 years old and causes a disease called erythema infectiosum, slapped cheek syndrome or fifth disease. Pregnant staff should not have contact with patients with known or suspected Parvovirus B19 infection unless known to be immune.

Staff Health
- Should you use Additional Precautions at work?
- Infectious diseases in staff can be readily transmitted to susceptible patients.
- Respiratory infections e.g. the “flu”, can be transmitted to patients by respiratory secretions shed by coughing, sneezing and on your hands.
- Infections on your skin can be transmitted to patients by your hands.
- Diarrhoeal infections can be transmitted to patients by your hands, on articles you have touched, and on food you have touched.

Skin Infection
Staff with suppurating lesions that cannot be adequately contained in a dressing should be excluded from work.

Diarrhoea and / or Vomiting
Staff with diarrhoea and vomiting should not attend work.
Herpes Virus Family
- The Herpes Virus Family possesses the ability to remain latent in the nerve tissue or lymphoid tissue and reactivate at a later stage. The most important human pathogens are:
  - Herpes Simplex Virus 1 and 2 (HSV1and2).
  - Cytomegalovirus (CMV).
  - Personnel who have active lesions of herpes simplex should not attend work until the lesions are dried and crusted.

Staff Positive for Blood Borne Viruses
If a staff member is found to be positive or volunteers information regarding their positive status for HIV, Hepatitis C or Hepatitis B, employer confidentiality must be maintained.

Immunosuppressed Staff
- Substantial depression of immune function predisposes a person to infection. Staff immunosuppressed to this extent should discuss this with their line manager. Examples of conditions include:
  - Neutropenia which is often associated with cancer chemotherapy.
  - Disseminated malignancy.
  - Medications that produce immunodeficiency (e.g. high dose oral steroids).
The Australian National Health and Research Council has adopted the term ‘Standard Precautions’ as the basic risk minimisation strategy, with ‘Additional Precautions’ used where Standard Precautions may be insufficient to prevent transmission of infection.

Definitions

Blood or Body Fluids Include:
- Blood, serum, plasma and all fluids contaminated with blood.
- Pleural, amniotic, pericardial, synovial and cerebrospinal fluids.
- Uterine / vaginal secretions and semen.

Blood or Body Fluid Exposure:
- Includes all needle stick injuries and splashes of blood or body fluids on non-intact skin, mucous membrane or cornea.
- St John Ambulance (Western Australia Inc. employees who are routinely exposed to blood and body fluids and patients with infectious diseases, are required to understand and make informed decisions concerning the implementation of Standard and Additional Precautions.

Standard Precautions

Introduction
Standard Precautions should be applied to caring for all patients, regardless of their presumed infectious status.

Standard precautions should be practiced in relation to the handling of:
- Blood, including dried blood.
- All other body fluids, tissues and excretions (excluding sweat) whether identified as infectious or not.
- All mucous membranes and broken skin, including rashes.

Standard precautions include the use of:
- Personal protective equipment:
  - Gloves.
  - Eye protection.
- Hand washing.
- Safe handling of sharps.
- Safe handling of medical / clinical waste.
- Use of aseptic techniques.
- Routine environmental cleaning.
- Appropriate cleaning of reusable equipment including use of disinfectants.

**Single–Use Sterile Instruments and Equipment**
- Single-use **sterile** equipment minimises the risk of cross infection and should not be re-used.
- All waste to be treated as clinical waste.

**Skin Disinfectants**
- An alcohol wipe (70% w/w ethyl alcohol or 60% v/v isopropyl alcohol) can be used prior to IV. cannulation or injection to reduce the bacterial load on the skin, and thus lessen the risk of infection.
- Wait for the area to dry before skin is penetrated.

**Additional Precautions**
- Additional Precautions are tailored to the specific infectious agent concerned and are used to provide protection from diseases that are spread either by contact, droplet or through the air. Additional Precautions should be used when there is a known or suspected risk to cross infection.
- Additional Precautions consist of Standard Precautions with the addition of:
  - Gowns/overalls — **contact precautions**.
  - P2 or N95 respiratory mask — **airborne and droplet precautions**.

**Contact**
- Using the appropriate level of Personal Protective Equipment (PPE) to provide a barrier, dependant upon the level of contact anticipated with the patient.
- Gloves / Gowns / Overalls.

**Droplet**
Staff must wear a high efficiency filtration facemask e.g. P2/N95 when in close contact with the patient i.e. within 1 metre or attending the patient in the ambulance.

**Airborne**
- Staff must wear a high efficiency facemask e.g. P2/N95 when in contact with the patient i.e. in the same room or when in the ambulance. This includes the driver.
- The patient should also wear a mask e.g. P2/N95. Ambulance staff should avoid aerosolising procedures i.e. nebulisers, intubation, suctioning, unless essential. Consider use of CBR respirator.

**Eyes**

Staff must wear eye protection while in contact with the patient until hand washing has been carried out.

**P2 or N95 Respiratory Mask**

High filtration masks that meet the US N95 or AUS/NZ P2 rating.
Precautions and Cleaning Required for Infectious Diseases

This procedure explains the precautions and cleaning required for managing patients with infectious diseases. The chart Additional Precautions and Cleaning Required for Specific Diseases overleaf lists the most common types of diseases encountered and what Additional Precautions and cleaning are required to manage these cases.

Standard Precautions must be implemented with all patients regardless of known infectious status.

Precaution level required and associated code:

P1  Contact.
P2  Contact, Droplet, Eye.
P3  Contact, Droplet, Eye (and non-pregnant staff only).
P4  Contact, Droplet, Eye, Airborne.
P5  Contact, Droplet, Eye, Airborne (acquired immunity only).
P6  Droplet, Eye.
P7  Contact (acquired immunity only).
P8  Airborne.
P9  Droplet, Eye, Airborne.

Additional Precautions

Contact

Use Gloves/Gowns/Overalls at the appropriate level to provide a barrier, dependant upon the level of contact anticipated with the patient.

Droplet

Staff must wear a high efficiency filtration facemask (e.g. P2/N95) when in close contact with the patient i.e. within 1 metre or attending to the patient in the ambulance. P2 or N95 are high filtration respiratory masks that meet the AUS/NZ P2 or US N95 rating.
**Airborne**
- Staff must wear a high efficiency facemask (e.g. P2/N95) when in contact with the patient i.e. in the same room or when in the ambulance. This includes the driver.
- The patient should also wear a mask (e.g. P2/N95). Ambulance staff should avoid aerosolising procedures i.e. nebulisers, intubation, suctioning, unless essential. Consider use of CBR respirator.

**Eyes**
- Staff must wear eye protection while in contact with the patient until hand washing has been carried out.

**Cleaning Level Required**

**Level 1**
Clean the stretcher and all direct / indirect surfaces that have been touched by the patient or the crew in the ambulance with detergent and water.

**Level 2**
Clean the stretcher and all direct / indirect surfaces that have been touched by the patient or crew in the ambulance with detergent and water, then disinfect.

**Level 3**
Clean the stretcher and all surfaces in the ambulance with detergent and water.

**Level 4**
Air the ambulance and clean the stretcher and all surfaces in the ambulance with detergent and water.

**Level 5**
Air the ambulance and clean the stretcher and all surfaces in the ambulance with detergent and water, then disinfect.

**Airing the ambulance** (only required with Level 4 and 5 cleaning):
- Open rear doors and close all other doors and windows.
- Run the fresh air cycle on the front air vents for five minutes on DeMIST.
- Run the fresh air cycle on the combined face / floor setting for five minutes.
<table>
<thead>
<tr>
<th>INFECTIOUS DISEASE/ORGANISM</th>
<th>ADDITIONAL PRECAUTIONS REQUIRED</th>
<th>TYPE OF CLEANING REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthrax</td>
<td>P4</td>
<td>Level 5</td>
</tr>
<tr>
<td>Avian Flu</td>
<td>P4</td>
<td>Level 5</td>
</tr>
<tr>
<td>Campylobacter</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>Chicken Pox (Varicella Zoster)</td>
<td>P5</td>
<td>Level 4</td>
</tr>
<tr>
<td>Clostridium Difficile</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>Influenza (A or B)</td>
<td>P2</td>
<td>Level 3</td>
</tr>
<tr>
<td>Measles</td>
<td>P5</td>
<td>Level 1</td>
</tr>
<tr>
<td>Meningococcal disease</td>
<td>P6</td>
<td>Level 1</td>
</tr>
<tr>
<td>MRSA (Methicillin Resistant Staphylococcus Aureus)</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>Multi resistant gram negative organisms</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>Multi resistant pseudomonas aeruginosa – totally resistant</td>
<td>P1</td>
<td>Level 2</td>
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<tr>
<td>Multi resistant Acinetobacter sp.</td>
<td>P1</td>
<td>Level 2</td>
</tr>
<tr>
<td>Parainfluenza</td>
<td>P2</td>
<td>Level 3</td>
</tr>
<tr>
<td>Pertussis</td>
<td>P2</td>
<td>Level 3</td>
</tr>
<tr>
<td>Parvovirus B19</td>
<td>P3</td>
<td>Level 3</td>
</tr>
<tr>
<td>RSV (Respiratory Syncytial Virus)</td>
<td>P2</td>
<td>Level 3</td>
</tr>
<tr>
<td>Rubella (German Measles)</td>
<td>P5</td>
<td>Level 1</td>
</tr>
<tr>
<td>Salmonella</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>SARS (Severe Acute Respiratory Syndrome)</td>
<td>P4</td>
<td>Level 5</td>
</tr>
<tr>
<td>Scabies</td>
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<td>Level 1</td>
</tr>
<tr>
<td>Shingles (Herpes Zoster)</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>P8</td>
<td>Level 4</td>
</tr>
<tr>
<td>Viral gastroenteritis (Rotavirus, Norovirus, etc)</td>
<td>P1</td>
<td>Level 1</td>
</tr>
<tr>
<td>VRE (Vancomycin Resistant Enterococcus)</td>
<td>P1</td>
<td>Level 2</td>
</tr>
</tbody>
</table>
INFECTION CONTROL POLICY
12.4 PERSONAL PROTECTIVE EQUIPMENT
July 2005

Indication
- Occupational Safety and Health legislation state; all staff must use personal protective equipment (PPE) where provided by the employer for their protection against hazards.
- Staff must use PPE when anticipating contact with blood or body fluids, or as required preventing transmission of infections as per Infection Control Policy 12.3 Infectious Diseases (Precautions and Cleaning).

Rationale
- PPE provides barriers and reduces the opportunity for cross infection. PPE also protects the skin, mucous membranes and clothes from exposure to blood and body fluids.

Personal Protective Equipment may consist of:
- Gloves.
- Masks.
- Eye protection.
- Disposable overalls (hooded) and infection control kits.
- Uniforms.
- Adequate footwear.

In determining the type of protective barriers to employ for any given procedure, the following should be considered:
- Potential exposure to blood and body fluids.
- The type of body fluids involved.
- Possible routes of transmission.

Gloves
- Gloves must be worn at all times where potential for exposure to blood and body fluids exists, in particular:
  - During procedures where direct contact is anticipated with blood or body fluids, mucous membranes or non-intact skin.
  - Whilst suctioning a patient.
  - Whilst performing an invasive procedure e.g. cannulation or taking a BSL.
  - Whilst handling items or surfaces contaminated with blood or body fluids.
- Caution: Wearing gloves does not replace the need for hand washing, as gloves may have defects, which are not immediately obvious, or may become damaged during use. Hands should be always washed after the use of gloves.

**Change and discard gloves**
- When there is more than one patient (for example, a motor vehicle accident).
- As soon as they are torn or punctured.
- After contact with an individual is complete and before care is provided to another.
- When performing separate procedures on the same patient and there is a risk of transmitting infection from one part of a body to another.
- On completion of any task not involving patient contact, but requiring the use of gloves e.g. handling contaminated linen.
- Before using telephones or radios, recording patient notes or driving a vehicle.
- With care to avoid contamination of hands or other surfaces. They must **NOT** be washed or re-used.
- **Utility gloves** (for station cleaning) may be re-used but should be washed in detergent after use, stored dry, and replaced if torn, cracked, peeling or showing signs of deterioration.
- Clean hands after the removal and disposal of gloves.

**Masks (disposable)**
- Wear masks whilst performing any procedure where there is a possibility of splashing / splattering of blood or body fluids.
- Masks must:
  - Be worn when attending to airway management, inspecting and / or suctioning airways and caring for patients with a cough.
  - Not be touched by hand while being worn.
  - Not be used again once worn.
  - Be replaced after becoming moist or visibly soiled.
  - Not be worn loose around the neck but removed and discarded as soon as possible after use.

**Protective Eyewear**
- Consist of protective glasses or goggles.
- Protective eyewear must be worn whilst performing any procedure with a possibility of splashing / splattering of blood or body fluids.
- Clean protective eyewear regularly or when soiled using detergent and water (disinfect if necessary).
- Prescription eyewear is not considered safety eyewear. If prescription eyewear is worn, suitable protective eyewear must be worn to cover the prescription glasses.

**Disposable Overalls (white)**
- Disposable overalls (white) should be worn to protect Officers clothing or skin, as required with Standard Precautions.
- Where the risk of substantial blood or body fluids contact is probable, then an impermeable or fluid resistant disposable overall should be worn (CBR yellow overalls).
- Overalls may also be donned to replace the Officer’s contaminated uniform as a temporary measure. Discard overalls after use as clinical waste.

**Protective footwear**
- Foot wear with closed toe and non-slip sole constructed of oil and acid resistant constructed of rubber) must be worn as specified in St John Ambulance footwear policy.
- Overboots are available with both the overalls (white) and CBR overalls (yellow), to be utilised as required.

**Uniforms**

**Procedure for grossly soiled uniforms:**
- In the event that an operational uniform is grossly soiled, the following procedure must be followed:
  - The Officer should, if practical, remove soiled clothing immediately and wash / shower as soon as possible either at the scene, hospital or station.
  - The Officer is to replace soiled uniform with an overall or spare uniform.
  - Notify the Line Manager at Communications Centre.
  - The Line Manager will liaise with crew and complete an Incident / accident Report Form.
  - Each soiled uniform is to be placed in a contaminated waste bag.
  - If contaminated beyond cleaning or uniform is an infection risk, then the uniform will be treated as clinical waste and deposited into the appropriate waste system.
Removal of contaminated PPE

- After cleaning equipment or when moving from a contaminated area:
  - Remove gown / overall and dispose of as clinical waste.
  - Remove gloves and dispose of as clinical waste.
  - Wash hands with soap and water and then dry. Disinfect with hand gel (alcohol 70%).
  - Remove mask and dispose of as clinical waste.
  - Wash hands again with soap and water and then dry. Disinfect with hand gel (alcohol 70%).
INFECTION CONTROL POLICY
12.5 HAND HYGIENE
July 2005

Indication
Clean hands immediately before and after any direct patient care (this requirement does not apply if the treatment is required urgently and hand hygiene facilities are not readily available).

Routine Hand Washing
Neutral pH soap should be used for routine hand washing. Scrub brushes should not be routinely used as their use may result in abrasion of the skin. they may also be a source of infection.

Rationale
Hand hygiene is the single most important procedure for preventing disease transmission.

Routine hand washing:
- Wash hands or other skin surfaces that are contaminated with blood or body fluids / substances immediately or as soon as practical.
- Wet hands thoroughly and lather with soap, vigorously rubbing hands together for at least 10-15 seconds.
- Rinse under running water.
- Dry hands. To minimise ‘chapping’ of hands, pat dry rather than rub them. Use paper, or if cloth towels are used, a fresh towel (or fresh portion of towel if a roller towel) must be used each time.
- Non-water cleansers should be used where no water exists (e.g. alcohol 70% based hand rubs or gels). Hands should still be washed with soap and water at the earliest opportunity.
- The requirement to clean hands applies regardless of whether gloves are worn or not.
- Cover cuts and abrasions on the hands with a water-resistant occlusive dressing.
- Protect hands from chafing by regular use of non-oil based moisturising creams.
Parts of the hand commonly missed during hand washing.
**Medical / Clinical Waste**
Includes all items (excluding re-usable equipment) that have suspected or known exposure to infectious disease, or blood and / or body fluids.

**Disposal of Medical / Clinical Waste**
- Contaminated waste generated during an ongoing ambulance call must be gathered and placed into suitable containers (vomitus bags, wet strength paper bags or other smaller plastic bags) provided in the ambulance and disposed of immediately following the end of the call. Large amounts of waste can be deposited into the large contaminated waste bags provided.
- Dispose of medical / clinical waste into a designated hazardous waste bin. If remote from a hazardous waste bin the clinical waste must be temporarily placed in a plastic hazardous waste bag (ambulance stock item) until such time that it can be disposed of in a hazardous waste bin. This can only be done at the hospital using their contaminated waste system. Hospital wards and ED departments use an incineration / deep burial process with all their waste.
- Contaminated waste gathered in the vehicle from cleaning blood / bodily fluids **must not** be dropped into the station’s garage bins for local shire pickup. Waste must be placed into the plastic contaminated waste bags and taken as soon as possible to be disposed of in the designated hospital contaminated waste system.
- **Note**: Bins outside the hospital are for general waste and are not designated medical /clinical waste bins.

**Sharps Handling and Disposal**
- Sharps such as IV cannula, needle-syringe or sharp instruments must be handled and disposed of by the person using the device immediately after use.
- They must ONLY be placed into an approved puncture resistant medical waste (Sharps) container for safe disposal.

**Rationale**
- The potential for transmission of blood borne diseases is greatest when needles or other sharp devices are used. The following must be adhered to:
  - The person using the sharp device is responsible for the management and immediate disposal of the sharp.
  - Wherever possible, minimise the use of sharps.
- Place sharp containers as close as practical to the point of generation and use of the sharp.
- Do not pass sharps by hand from person to person.
- Do not re-sheath used needles.
- Do not remove needles from syringes prior to disposal.
- Dispose immediately of sharps into a sharps container following use.
- Do not force sharps into sharps containers.
- Do not overfill sharps containers – replace when three-quarters filled.
- Securely seal sharps containers with a lid before disposal.
- Dispose of sharps containers into the Sharps clinical waste bin.
Indication
Use clean linen (e.g. sheet, pillow case and blanket) for every patient.

Rationale
Contaminated linen can be a source of cross infection. Use the following guidelines when handling contaminated linen:

- Handle used or soiled linen in a manner that prevents contact with skin and mucous membranes, contamination of clothing and transfer of microorganisms to other patients and the environment. Ensure minimal compression or dropping as this may pose a risk of generating potentially infectious aerosols.

- Linen used for a known infectious patient (e.g. SARS) may require special handling. Advice should be sought at handover from the receiving hospital regarding cleaning procedures and disposal of clinical waste.

- If linen is wet or heavily soiled, place linen into a plastic bag.

- Care should be taken that no sharps or other objects are accidentally discarded with the linen.

- Linen bags should not be filled more than ¾ or stored for prolonged periods.

- Deposit into designated laundry service linen bags at an appropriate hospital.
INFECTION CONTROL POLICY
12.8 EXPOSURE TO BLOOD, BODY FLUIDS OR CROSS INFECTION
July 2005

DEFINITIONS

Blood or body fluids include:
- Blood, serum, plasma and all fluids contaminated with blood.
- Pleural, amniotic, pericardial, synovial and cerebrospinal fluids.
- Uterine/vaginal secretions and semen.

Blood or Body Fluid Exposure
Includes all needle stick injuries and splashes of blood or body fluids on non-intact skin, mucous membrane or cornea.

Indication
Use the following procedure for exposure to blood or body fluids or cross infection.

Rationale
Blood borne disease may be transmitted by significant exposure to blood or other body fluids. Officers may therefore be exposed to a cross infection risk.

Management
- If your intact skin has been exposed to blood or body fluids, wash the skin as soon as possible.
- If you have sustained a splash exposure to the eyes, nose, mouth or non-intact skin with blood or body fluid (excluding sweat), sustained a contaminated sharps injury, or have been exposed to an infection the following procedures apply:
  - Institute first aid (Attachment 1) if appropriate.
  - Report the incident to your line manager.
  - Line manager will arrange immediate medical assessment with Delta Health in business hours and St John of God Murdoch Hospital after hours.
  - Officer may seek treatment / advice from emergency departments or GP (Attachment 2).
  - Complete Accident / Incident Report form available on the intranet.

- If your uniform has been splashed with blood or body fluids ensure that the uniform is changed as soon as possible and any affected skin is washed. Contaminated clothing may require replacement rather than cleaning.

- Line Managers to (see Attachment 2):
  - Maintain the confidentiality of the employee and provide all assistance where possible.
  - Ensure the employee has initiated first aid treatment (see Attachment 1).
  - Direct Officer to be assessed for specialist advice, treatment and follow up (see Attachment 2).
  - Ensure the provision of peer support or counseling is provided.
  - Ensure Officer completes *Occupational Safety and Health – Checklist “Blood and Body Fluid Splash/Cross Infection Concern”* (Attachment 3) available on intranet.
  - Direct Officer to contact Human Resources department for further advice.
  - **Note**: Delta Health can be contacted at Delta Health Medical Centre, 580 Newcastle Street, West Perth. If next day is a Sunday or Public holiday telephone 9321 9133 for an appointment.
ATTACHMENT 1

Exposure Incident First Aid

Contaminates on skin

Yes

Immediately wash area thoroughly with soap and water. Where soap is not available rinse with water. If no water available, use 70% alcohol based hand rinses (Wash with soap and water at the earliest opportunity).

No

Skin penetrated

Yes

Immediately wash thoroughly with water and soap. Where soap is not available rinse with water. If no water available, use 70% alcohol based hand rinses. Apply Povidone / Iodine. Note: If needle stick encourage bleeding from site.

No

Eyes contaminated

Yes

Immediately rinse the area gently but thoroughly with water or normal saline while eyes are open.

No

Contaminates in mouth

Yes

Immediately spit out and then rinse the mouth with water several times.

No
Officer to contact Line Manager via Communication Centre and also report incident to shift Occupational Safety and Health Representative.

Line Manager to contact Gemini Medical and advise of situation or St God Murdoch after hours. They will advise immediate action.

Line Manager to arrange for Officer to attend facility immediately for assessment and treatment. Officer may also attend ED or seek own GP advice. Treatment Options remain with the Officer.

Line Manager to ensure:
Officer completes Blood and Body Fluid Splash / Cross Infection Concern checklist form. Accident / Incident Report form Part A (both are available on the intranet).
Obtain PCRF details.
Advise Human Resource Department.

Line Manager to provide:
Confidentially for the Officer. Support by attending with the Officer for assessment. Provide counselling where possible. Complete necessary Workers Compensation documentation. Send completed forms to relevant departments.

Line Manager to ensure Officer has follow up to tests with Delta Health. Officer is not to return to work until a return to work certificate is provided to the employer. Medical Director to be kept informed on any potential ongoing risk to the organisation.
ATTACHMENT 3

Occupational Safety and Health — Checklist
Needlestick/Body Fluid/Blood Splash/Cross Infection Concern

Date of incident: Date notified: ___/___/______
___/___/______

Time: _______ hours Case Manager Notified: Yes / no
No. _______

Time notified: _______ hours

Manager: ________________________________________________

Staff involved: _________________________ No. _______ Shift D/N

Station_________________

Staff involved: _________________________ No. _______ Shift D/N

Station_________________

WORKERS’ COMPENSATION? YES / NO
If YES, complete Parts A and B.
If NO, complete Part B only

Seen by Manager? Yes / No

Signed EMPLOYEE CLAIM FORM completed (Form 2B)? Yes / No

First Medical Certificate attached? Yes / No

To Human Resources? Yes / No Date:
___/___/_______
PART A

Any injury?  Yes / No

If YES –
  i. Needlestick
  ii. Body Fluids
  iii Blood Splash
  iv. Other ________________________________

First response (iodine scrub)?  Yes / No

If i ii or iii.
  a) SJOG, Murdoch
  b) Gemini Medical Centre
  c) Other__________________________________

Doctor/contact name: ________________________________
Date ___/___/____

Time__________ hours

Blood test?  Yes / No

If i, ii or iii Prophylactic Antibiotics given?  Yes / No

Receiving hospital informed of follow up?  Yes / No

Support for Officer and family given?  Yes / No

Information pack given to Officer?  Yes / No
PART B

Location of incident_________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Details_____________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Equipment involved? Yes / No
Description:________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Has equipment been taken out of service? Yes / No

PCRF attached? Yes / no
Action_____________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Further follow up? Yes / No (Circle appropriate) — One month Two months Three months Six months

OSH Representative notified? Yes / No
Name_____________________________________________________________________
Manager’s signature_____________________________________________________________________

Medical Director’s signature_____________________________________________________________________
INFECTION CONTROL POLICY
12.9 ROUTINE CLEANING OF VEHICLES AND EQUIPMENT
July 2005

Indication

- Clean internal flat surfaces of operational vehicles when visibly soiled at the start and end of each shift.
- A more detailed clean of the inside of the vehicle should be carried out weekly.
- Clean treatment areas (e.g. casualty rooms on industrial sites) when visibly soiled or at least weekly.

Rationale

Deposits of dust, soil and microbes on surfaces are a potential source of health care associated cross infection. A regular cleaning regime should include the patient care area, driver and passenger area, equipment compartments, steering wheel and door handles.

Preparation

- Prior to cleaning, don the appropriate level of personal protective equipment.
- Remove equipment to gain clear access for cleaning. Equipment should be cleaned as per CPG Infection Control Policy 12.11 Cleaning of Re-usable Equipment.

Cleaning

- Use Viraclean 1:10 (as per manufacturer’s recommended concentration) in normal tap to luke-warm water for cleaning to remove gross dirt etc. **Do not** use hot water above 50°C as this will cause blood to gel and decrease the ability of the cleaner / disinfectant to work.
- **Note**: Viraclean neat is a disinfectant and detergent. When diluted 1:10 it is detergent strength only. C3 Plus (detergent) may be used for this purpose.
- Use mop in a designated cleaning bucket, and use cleaning cloths to clean surfaces.
Disinfecting

- This is only required for suspected or known exposure to infectious disease or blood / body fluids.
- Thoroughly clean following the above method.
- Small areas are treated by using Viraclean (neat) over areas of previous contamination.
- For large areas, apply Virkon (as per manufacturer’s recommended concentration) in warm to hot water with a mop in a designated cleaning bucket, and / or use cleaning cloths to clean surfaces.
- Dry surfaces with a fresh towel or ensure surfaces are allowed to dry thoroughly.

Off site cleaning

- If cleaning is undertaken where appropriate equipment is not available, use alcohol impregnated wipes as an interim cleaning option or disposable cleaning cloths, paper towels and Viraclean neat.
- Dry surfaces with a fresh towel, or ensure surfaces are allowed to dry thoroughly.
- Avoid the use of cleaning methods which may generate airborne particles (sweeping, spray and wipe cleaning methods etc.).

After cleaning

- Wash buckets and mops with warm water and Viraclean 1:10 or C3 Plus and store in a manner to facilitate drying.
- Maintain cleaning equipment in a clean and hygienic condition. Replace mops regularly. Discard cleaning cloths after use (clinical waste).
INFECTION CONTROL POLICY

12.10 CLEANING OF VEHICLES HEAVILY CONTAMINATED WITH BLOOD OR BODY FLUIDS

July 2005

Indication
Use the following guidelines when a vehicle becomes heavily soiled with blood or body fluids.

Rationale

- Vehicles heavily contaminated with blood and body fluids will be removed from service and cleaned as soon as practicable.
- Use same cleaning process as described in Infection Control Policy 12.9 Routine Cleaning of Vehicles and Equipment. All vehicles with suspected or known exposure to infectious disease or blood / body fluids must be cleaned AND disinfected.

Special considerations

- Prior to cleaning, don the appropriate level of personal protective equipment. In this instance, use gloves, protective eyewear and gown / overalls to protect hands, eyes and clothing from splashing with body fluids.
- Remove necessary equipment from the vehicle and prevent further contamination. Equipment is to be cleaned as per CPG Infection Control Policy 12.11 Cleaning of Re-usable Equipment.

Cleaning

- Manage the blood and body fluids spill by:
  - Confinement (prevent spread of contamination).
  - Containment (cover spill with absorbent material, towel, sheet etc., to absorb the bulk of the blood or body substance)
  - Disposal (treat as clinical waste).
- Use cleaning methods that reduce the chance of splashing or contamination of clothing, or the environment, to remove the gross spillage.
- When the gross spillage has been removed, use the routine cleaning of vehicles procedure to complete the task, paying special attention to the cleaning of all equipment, stretcher, fittings and surfaces.
- It is illegal to allow contaminates to enter into public storm-water drains etc. However, separate soak wells at Stations which are not connected to public storm-water drains may be used. Officers must contact the Property and Supply department to confirm suitability before use.
- When cleaning is complete, restock and prepare the vehicle for operational use. A full vehicle inventory check is recommended at this point.
- For cleaning of equipment refer to CPG Infection Control Policy 12.11 Cleaning of Re-usable Equipment.
Indication

- In general the principles of cleaning do not alter, however, manufacturer’s recommendations for the correct care and cleaning of the equipment should be followed wherever possible.
- The minimum acceptable standard of cleaning is detailed in the relevant section of the Infection Control Policy.

Rationale

Reducing the microbial burden on patient care equipment after each use will minimise the chance of cross infection.

Basic cleaning

- Prior to cleaning, don the appropriate level of personal protective equipment in accordance with the Standard and Additional Precautions procedure and according to the cleaning task.
- Soiled equipment should be cleaned as soon as practicable after soiling occurs.
- If cleaning must be delayed, used equipment should be placed in a sealed, leak proof container, such as a yellow clinical waste bag, until cleaning can take place.
- Prior to cleaning, gross soiling should be removed by rinsing under tap to luke-warm running water. Blood gels in hot water (over 50°C) and reduces the effectiveness of cleaning products.
- Once the bulk of contamination is removed a detergent may be needed to thoroughly clean the item. Viraclean 1:10 or C3 Plus (at concentration recommended by the manufacturer) added in warm to hot water.
- Equipment should be dismantled or opened as far as possible.
- Items suitable for immersion should be held low in the sink, or preferably under water, to prevent the generation of potentially infectious aerosols during cleaning.
- All surfaces of the item should be thoroughly washed.
- After cleaning, the item should be thoroughly rinsed in warm to hot running water to remove any detergent residue.
- Items should be dried thoroughly using a non-linting cloth.
- Care must be taken to ensure clean items are not re-contaminated at the completion of the cleaning process.
- Cleaning tools should be washed and stored dry (or discarded if appropriate) at the end of each cleaning session.
- The cleaning area must be cleaned thoroughly after each use and on a regularly scheduled basis.
- Items that cannot be easily dried using non-linting cloths such as soft bags, straps and harnesses, and require the use of a mechanical drying cabinet, should be processed by an appropriate laundry service or hospital based sterile processing facility. Contact your Line Manager or follow local guidelines for laundering.

Disinfection

- After cleaning, disinfect the equipment by either washing all surfaces with disinfectant solution Viraclean (neat) or if suitable, soak the equipment in the disinfectant solution (Virkon) for 10 minutes. Note: objects that tend to float need to be held under the surface.
- The equipment then needs to be **thoroughly dried before reassembling**.
- Disinfect accessory equipment e.g. ECG leads, monitors (BSL or Cardiac) by using alcohol wipes, Virkon or methylated spirits (Station only) after normal removal of contaminants.
- For detailed instructions on the cleaning of respiratory equipment please refer to the individual CPGs concerning those pieces of equipment.
INDUCTION CONTROL POLICY
12.12 AIRWAY FILTERS
July 2005

Indication

- Use a bacterial / viral airway filter when ventilating or on demand using:
  - Bag Valve Mask (BVM) resuscitator.
  - Demand head resuscitator.

Rationale

- Airway filters provide a barrier to cross contamination between patients and ventilation equipment and vice versa (provides 99.9% protection).
- The use of a filter allows Officers to clean and disinfect respiratory equipment without a full internal clean.
- Use the filter for a single patient use only and discard after use as clinical waste.
- Replace the filter, if during use, it becomes contaminated with blood or body fluids. Officers should carefully check for contamination past the filter and where necessary conduct full cleaning and disinfection procedures on external and internal parts.

Caution:

- For clinical reasons, airway filters should not be used for patients under 10kg in weight (recommendation due to the dead space issue whilst ventilating).
- Where the filter is not used, full cleaning and disinfection procedures are to be used on external and internal parts.
Rationale
The station environment should be maintained in a clean and hygienic manner and should comply with Standard Precautions, equipment and vehicle cleaning procedures and provide a safe and healthy working environment.

Kitchen
- The kitchen should be cleaned prior to the completion of each shift and rubbish removed.
- Fridges should be cleaned regularly and outdated food removed.
- Ovens and microwaves should be wiped down after each use.
- Medications requiring refrigeration should be kept away from foods.

Bathroom / Toilets
- Bathrooms and toilets should be kept clean at all times.
- Liquid hand-soap should be supplied in a non-refillable dispenser.
- Paper towels should be readily available.
- Suitable hand moisturiser should be readily available in a pump pack.
- Sanitary units to be regularly serviced (contracted).

Staff Locker Rooms
Should be kept clean and tidy at all times. No food to be stored within lockers.

Office Areas
Should be regularly cleaned.

Storeroom
Should be kept clean and tidy, and floors cleaned at least weekly. If the area is hosed, do so in a fashion that minimises potential contamination of the environment, equipment and clothing.

Vehicle Cleaning Area
- Appropriate cleaning equipment is readily available (cleaning cloths, detergents, housekeeping gloves, mops and buckets) and must be kept in a clean and hygienic condition, and in good working order.
- Mops should be cleaned after use and hung to dry.
- Designated mop and depot cleaning buckets (Yellow for vehicles, Blue for Depots) must not be interchanged and should be cleaned after use and stored dry.
- Housekeeping gloves should be washed and dried after each use.
- Appropriate personal protective equipment is available.
- Dirty linen to be transported for cleaning.

**General Waste (bins)**

Should be kept in clean condition and together with clinical waste (bags) be readily available, and provision made for removal.

**Equipment Cleaning**

- The following is readily available:
  - Disposable cleaning cloths and paper towels.
  - Neutral detergent.
  - Disinfectant.
  - Cleaning brushes of appropriate sizes e.g. scrubbing brush, bottle brush.
  - Appropriate personal protective equipment.

**Cleaning, Chemical and Stock Storage Areas**

- Should be kept clean and hygienic.
- Regular cleaning of shelving will minimise potential contamination of sterile stock.

**Lounge and Rest Areas**

Should be kept clean and tidy.

**Sleeping Quarters**

- Sleeping quarters should be kept clean and tidy.
- Linen to be provided by Officers and kept neat and tidy.
- Linen to be removed or placed in personal lockers at the end of each night shift.
- Electric blankets to be turned off when not in use.

**Garage**

- Kept clean and tidy.
- Oil spills to be absorbed and cleaned as necessary.
- Cleaned weekly or as required.