Clinical Practice Guidelines
ALS and MICA Paramedics

Ambulance Victoria
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Developed by Media4Learning: www.media4learning.co.nz
**Intended Patient Group**

- ALL patients regardless of COVID-19 status.
- Adults and Paediatrics

**Care objectives**

- To minimise workforce and community exposure to COVID-19 to optimise safety.
- To provide modified care while maintaining a safe work environment during COVID-19 pandemic.

**General notes**

The content of this guidelines applies to ALL patients regardless of their COVID-19 risk. A patient’s presentation does not have to be related to COVID-19 for the contents of this guideline to apply.

**Case definition and required PPE**

- Both the case definition and required PPE will likely evolve over time and can be found here.

**Assessment**

There are **NO** modifications to the Clinical Approach.

- A thorough clinical assessment as per the AV Clinical Approach is expected to be complete for all patients in AV care. This includes patients who are suspected or confirmed COVID-19 positive.
- Posterior chest auscultation is **appropriate** in **suspected or confirmed** COVID-19 patients. It is considered best practice to clean the stethoscope after each case.
- Some COVID-19 patients may present with “silent hypoxia” (low SpO₂ without dyspnoea, tachypnoea or cyanosis). Full assessment including respiratory rate and pulse oximetry should be applied in all patients with suspected or confirmed COVID-19 regardless of symptoms.

**Aerosol generating procedures (AGPs)**

**Airborne precautions required for all AGPs**

- The following are AGPs. A modified approach is now required for these procedures.
Aerosols may remain in the air for more than 30 minutes in confined or poorly ventilated spaces. Do not remove PPE immediately following AGPs. Airborne PPE should also be considered where an AGP occurred prior to arrival (e.g. patient’s at-home nebuliser).

Non-invasive ventilation (NIV) / CPAP

- **Prohibited in all patients** due to high risk of aerosol generation.
- All patients previously requiring NIV are high risk for deterioration on exertion. Move patients cautiously as per [CPG A0112 Ambulation Risk Assessment](#).
- APO: Consider management with oxygen therapy and GTN to stabilise prior to extrication if possible.

Nebulised medications (Adult and Paediatric)

- **Patients ≥ 16 yrs:**
  - **Prohibited in all patients** due to high risk of aerosol generation
  - Administer Salbutamol via pMDI
  - Administer Ipratropium pMDI where available and indicated. Follow patient’s prescribed management plan. If a plan is not available administer 8 puffs (21 mcg/puff)
  - Severe asthma: consider early IM adrenaline and Dexamethasone
  - COPD: Salbutamol pMDI and spacer, 4-12 puffs (no repeat dose)
  - Adult stridor: Do not nebulise. Expedite transport.

- **Patients < 16 yrs:**
  - Only administer nebulised medications for Critical Asthma, Severe Croup and Anaphylaxis
  - Where bronchospasm is the presenting problem, further doses of salbutamol should be delivered via a pMDI and spacer if possible

- **Do not nebulise in the ambulance** or any other confined space if possible
  - Where possible, maintain a distance of 1.5 metres from the patient. If loaded, move the patient out of the vehicle if nebulised medication are required
  - Only nebulise outdoors or in a large well-ventilated area
  - Nebulised medications should only be administered in the ambulance as a last resort (e.g. scene safety, inclement weather)

- When administering any pMDI:
  - Use spacer
  - Patient should self-administer at a distance, minimising time spent without surgical mask
  - Hand hygiene before and after administration (paramedic and patient)

Suction

- Minimise where possible.
- Only suction where fluid or secretions present a significant airway risk.
- Use a closed suction system where available.
Intubation

- **Do not intubate in the ambulance** or any other confined space if possible.
  - If loaded, move the patient out of the vehicle if intubation is required
  - Only intubate outdoors or in a large well-ventilated area
  - Intubation in the ambulance should only be used as a last resort (e.g. scene safety, inclement weather)

- Initial supplemental oxygen should be provided as per “Oxygen therapy” section below followed by five minutes of pre-oxygenation with a BVM.

- Do not use apnoeic oxygenation via a nasal cannula.

- Elevate head of bed to 45° angle (unless spinally immobilised) to minimise required ventilation pressure.

- The most experienced / skilled airway clinician should perform the intubation to maximise first-pass success and reduce exposure.

- Avoid or minimise suction where possible and appropriate.

- Video laryngoscope recommended for all attempts to increase the distance between intubator and patient’s mouth. Where video laryngoscopy fails or is not feasible, move to direct laryngoscopy.

- Confirm tube placement via capnography (only auscultate chest after inflating ETT cuff).

- Place nasogastric tube immediately after the ETT with syringe already connected.

- Where patients are being intubated specifically for respiratory failure/altered conscious state associated with COVID-19, *optimisation* of oxygen saturation is the goal prior to paralytic administration (as opposed to normalisation of oxygen saturation).

- RSI is now the only method of drug facilitated intubation in all patients to reduce risk of aerosol generation via cough or gag. Paediatric RSI (< 12 years of age) is only approved for MICA Flight Paramedics (not approved for MICA paramedics).

- IFS is prohibited in all patients. This includes paediatric patients.

- RSI should only be undertaken when there is altered conscious state (GCS < 10) **AND** there is a major compromise to any of:
  - Airway
  - Ventilation
  - Oxygenation

- A low GCS but without the above criteria is **no longer** an indication for RSI except if air transport is required.

- Extra care should be taken to avoid circuit disconnection as this may increase risk of exposure.

BVM

- BVM is only to be withheld *initially* in adult cardiac arrest in favour of ETI/SGA.

- BVM ventilation is still required in critically hypoventilating / apnoeic patients (e.g. opioid overdose).
Two-handed face mask grip technique reduces the risk of aerosol generation.

Attach viral filter directly to face mask.

**Spontaneously ventilating paediatric patients:** Gentle assisted ventilation is required to prevent rebreathing of CO$_2$.

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**Supraglottic airway (SGA)**

- **Do not insert SGA in the ambulance** or any other confined space.
  - If loaded, move the patient out of the vehicle if SGA is required
  - Only insert outdoors or in a large well-ventilated area
  - Inserting an SGA in the ambulance should only occur as a last resort (e.g. scene safety, inclement weather)

- Place SGA with viral filter already attached and transition early to ETT where possible.

- Insert nasogastric tube with syringe already connected immediately following placement of SGA/ETT. If nasogastric tube not available, use tape to cover the OG port on the SGA.

- Ensure SGA is seated appropriately and taped in place (capnography may assist in identifying leakage).

- An SGA should be used in preference to BVM when applying **CPG A0303 Difficult Airway**
**Guideline.** If ventilation is effective, consider sedation as per CPG A0301 Supra-Glottic Airway if required to maintain the SGA.

### Cardiac arrest

**All responders should apply appropriate PPE**

- **Adults:** Do not initially perform BVM ventilation (in cardiac arrest)
- **Patients < 16 years:** No change. BVM ventilation should be used as per the relevant CPG.
- Airway management in order of preference:
  - ETT
  - SGA (ETT delayed or not available)
  - NRB at 15 L/min over surgical mask (if ETT/SGA delayed or not available) and progress to BVM where arrest duration > approx. 8 minutes / 4 cycles. BVM ventilation may be required earlier in cardiac arrest of respiratory aetiology.

- Pause compressions until SGA is inserted or ETT cuff is inflated and placement confirmed.
- Confirm ETT placement with capnography (only auscultate chest after ETT cuff inflated).
- Consider early mechanical CPR to reduce staff exposure.
- Bystanders who performed chest compressions and who do not know the patient (e.g. GoodSAM responders) should be referred as per the section Referral - Bystanders below.
- **Cardiac arrest likely** (e.g. STEMI): If the patient is suspected or confirmed COVID-19, consider donning airborne precautions pre-emptively whilst maintaining clinical care.
- **Witnessed arrest:** If wearing a P2 mask, eye protection and gloves, it is safe to defibrillate and commence chest compressions prior to applying a gown where the patient is wearing a surgical mask. This principle also applies when the patient is found to be in cardiac arrest on arrival despite not having been dispatched as a cardiac arrest.

### Withholding / ceasing resuscitation

- If the patient is **confirmed** COVID-19 and is in cardiac arrest **suspected to be due to the disease**:
  - **Asystole:** resuscitation can be withheld / ceased immediately.
  - **PEA:** resuscitation may be withheld / ceased if **any** of the following criteria are present:
    - Unwitnessed / no immediate CPR
    - Age ≥ 65 years
    - Dependant ADLs / major comorbidities
  - First Responders and NEPT consult with AV Clinician to seek management direction where the AED does not advise defibrillation. Manage shockable rhythms as per the appropriate CPP.
Deceased patients

- Airborne precautions should be worn while handling deceased patients.
- Avoid unnecessary handling of the body in a way that may expel air from the lungs.
- Leave viral filters attached to SGA/ETT.
- Cover any wounds with dressing where possible.

Other procedures

The following are not considered aerosol generating and do not routinely require airborne precautions. However, a modified approach is recommended in order to reduce the risk of transmission.

Oxygen therapy

- **Hypoxia:** Use lowest flow rate (within the range outlined below) to achieve target $\text{SpO}_2 \geq 90\%$.

- Critical illness OR other conditions requiring oxygen regardless of $\text{SpO}_2$ (as per CPG A0001 Oxygen Therapy) - use 15 L/min via nasal cannula with a surgical mask over the top (or NRB if required as per below)

- Where hypoxia persists despite maximum flow rate but patient remains alert, do not escalate oxygen therapy devices (e.g. do not move from nasal cannula to NRB mask).

- **Turn off oxygen prior to removing mask / cannula from patients face.**

- **Nasal cannula:**
  - Nasal cannula (2 – 15 L/min) is the preferred method of oxygen delivery
  - Use nasal cannula with a surgical mask over the top

- **Non-rebreather mask:**
  - Use only where nasal cannula is not tolerated or unlikely to be tolerated (e.g. paediatric patients)
  - Place NRB over surgical mask
  - Flow rate 10 - 15 L/min

- **Simple face mask:** Not recommended.

Methoxyflurane / IN Fentanyl

- Administer with caution due to increased risk of coughing, proximity of staff undertaking administration and requirement to remove surgical mask (where mask was indicated)

- Where the patient is able, ask the patient to self-administer IN Fentanyl (hand hygiene for both paramedic and patient before and afterwards).

- Prioritise other analgesic approaches.
Oral medications

- **Administer with caution:**
  - Patient should self-administer at a distance, minimising time spent without face mask (where mask was indicated)
  - Hand hygiene before and after administration (paramedic and patient)

Cannulation and chest decompression

- **External jugular:**
  - Un-intubated patients - Avoid if possible
  - Intubated – No modifications to current practice

- **Chest decompression** is a lifesaving procedure. There are no modifications to current practice.

- **IV cannulation:** No modification to current practice.

Child birth

- Airborne precautions should be worn during child birth for patients who are suspected or confirmed to have COVID-19.
- The woman and newborn infant should not be separated regardless of COVID-19 status.

Further notes

Dexamethasone

- A recent large multicentre trial suggests a benefit to the administration of dexamethasone in patients with severe COVID-19 who need invasive or non-invasive mechanical ventilation. There is currently no evidence or expert opinion supporting its use in the prehospital environment for respiratory failure due to COVID-19 (in the absence of other indications).
- Dexamethasone **should still be administered** where indicated for other serious conditions (e.g. severe asthma, COPD) regardless of COVID-19 status.

Chloroquine / hydroxychloroquine overdose

- There have been several recent cases of people self-medicating with the antimalarial medications chloroquine and hydroxychloroquine leading to overdose.
- Manage symptomatically.
- Contact Poisons Information for management advice (**13 11 26**).

Viral / bacterial filter

- The bacterial filter currently in use is also rated to filter virus particles.
- It is recommended that these are attached directly to the ETT, SGA or BVM mask to limit the spread of viral particles through equipment.
Discuss and plan with the receiving hospital staff the safest method to reduce exposure when switching ventilator circuits on arrival at hospital. This may include maintaining the viral filter on the AV ventilator circuit (to contain condensation) and clamping the ETT (where appropriate equipment is available).

Figure 3. Direct filter attachment to ETT or BVM mask

Home ventilated patients

- Home-ventilated patients on CPAP or BiPAP and those with tracheostomy (with or without
ventilation) who have suspected viral respiratory tract infection should be managed as suspected COVID-19 including COVID-19 precautions and PPE.

**Transport**

- Refer to [Operational Response](#) in relation to family members or bystanders accompanying patients to hospital.
- Refer to DHHS [Transfer and transport guidance](#) for appropriate transport destination for patients with suspected or confirmed COVID-19.
- Refer to Regional Cluster Plan for specific details regarding the capabilities of individual hospitals. Local arrangements may vary.
- Where other specific transport criteria are met (e.g. stroke, STEMI, Major Trauma, cardiac arrest) patients must be transported to the hospital appropriate for that condition **according to the relevant CPG**.

**Referral**

- Patients should be managed in the most appropriate location for their care needs as per standard AV practice. Patients who do not need hospital care should not be attending hospital.
- **Suspected COVID-19:** Patients meeting the case definition for suspected COVID-19 may be referred to a GP respiratory clinic or assessment centre for testing and ongoing management if they:
  - Do not meet any Clinical Red Flags as per [CPG A0108 Patient Safety / Clinical Flags](#), **AND**
  - Are not hypoxic (SpO₂ < 94% or less than normal for patient)
  - Have no other clinical need for transport
- **Confirmed COVID-19:** Patients who have confirmed COVID-19 being managed in the community may develop serious illness and deteriorate rapidly, particularly around 5 - 8 days from symptom onset. Maintain a high index of suspicion for serious illness / deterioration and consider transport in patients with the following risk factors:
  - Elderly (risk increases with age)
  - Morbid obesity
  - Co-morbidities (particularly heart disease, hypertension, prior stroke, diabetes, chronic lung disease, and chronic kidney disease)
  - Chronic lung disease / moderate-severe asthma
  - Immunocompromised
  - Unsuitable home environment
- If referring the patient, the following actions are mandatory:
  - Attempt to discuss care with GP / existing treating team
  - Clearly explain the importance of medical review, social distancing, hand hygiene, and testing
  - Explain and ensure understanding of the care plan and appropriate safety netting
  - Provide a surgical mask
  - Provide hand hygiene
  - Ensure the plan to attend GP respiratory clinic / assessment centre will be achieved in a way that protects the community from exposure (e.g. private car, not public transport)
Bystanders

- Bystanders who have been exposed to a suspected or confirmed COVID-19 patient should be offered hand hygiene and instructed to seek further medical advice.

**Australian Government COVID-19 hotline 1800 675 398**

**Inter-facility transfers**

- It is likely that there will be an increasing volume of patients requiring transfer between medical facilities during the COVID-19 pandemic.

**At the referring hospital**

- Receive handover from the staff at a distance from the patient. This should include the transferring health services understanding of the COVID risk, any testing that has been undertaken, results of these tests, and reason for transfer.
- Apply appropriate PPE before patient contact. The hospital may have a designated area where you can do this.
- Ensure that the Duty Manager / ARV Coordinator is aware that you are about to enter a COVID isolation area and may be difficult to contact.
- Only bring the equipment into the patient’s environment that you are likely to need. Prepare infusions and other items required for the transfer outside of the patient environment wherever possible.
- If the patient is intubated and equipment is available at the referring facility, a closed suction system (in-line) maybe attached to the circuit (between the ETT and the viral filter). Do not remove these items if they are already in place.
- If no AGP is performed at the referring hospital, the PPE worn there should be kept on for the duration of the transfer if possible (to decrease risk of staff exposure while doffing). If in close proximity when an AGP is performed, consider changing PPE prior to transfer if able to do so safely.

**Ventilation**

- Patients should be kept deeply sedated and paralysed for the duration of the transfer.
- Contact the ARV Clinical Coordinator if advice is needed on ventilation.

**During transport**

- Inform receiving hospital of arrival time and confirm plan for entry to destination unit (via Clinician / ARV Coordinator).

**Related resources**
References


List of Figures

Figure 1. CPAP image. Ambulance Victoria. 20/04/2020.

Figure 2. ‘Vice Grip’ diagram by Nicholas Chrimes. Licensed mdi CC BY 4.0.

Figure 3. BVM images. Ambulance Victoria. 30/03/2020.
Flowchart

**Status**
- All patients regardless of COVID-19 status

**Oxygen therapy indicated**
- Conscious AND Hypoxaemia (SpO₂ < 90%)
- Position sitting upright
- Oxygen via nasal cannula (2 – 16 L/min) titrated to SpO₂ ≥ 90%
- P1 / Surgical mask over nasal cannula

Hypoxaemia persists but alert:
- Tolerate hypoxaemia WITHOUT escalation in oxygen therapy

Hypoxaemia persists with reduction in conscious state:
- Mx as per Altered conscious state

**Altered conscious state**
- Altered conscious state

**Cardiac arrest**
- P1 / Surgical mask on patient
- No initial BVM
- Early SGA
- Pause compressions while inserting SGA / ETT
- Minimise suction
- BVM where arrest duration > approx. 8 minutes / 4 cycles (SGA not available)
  - Early ETT
  - Early mCPR

**Do not intubate in a confined space if possible**

**Pre-intubation**
- Initial oxygen via nasal cannula with P1 / surgical mask (case once positioned at airways)
- 45° elevation
- Pre-oxygenate with two-handed BVM technique for 5 minutes

**Insertion**
- RSI to avoid cough / gag
- Most experienced / skilled airway clinician to perform intubation
- Avoid or minimise suction where possible and appropriate
- Video laryngoscope recommended for all attempts
- Ensure cuff seal using manometry (40 cmH₂O)
- Confirm tube placement via capnography only (no auscultation)
- Apply filter directly to the ETT
- Place NG tube immediately after the ETT with syringe already attached

**Nebulised therapy usually indicated**
- Do not nebulise in ambulance or any confined space

Manage as per Nebulised Medications (General notes)

Age ≥ 16 yrs:
- Do not nebulise medications
- In severe Asthma, consider early Adrenaline IM and Dexamethasone

Age < 16 yrs:
- Only administer nebulised medications if required for Critical Asthma, Severe Group and Anaphylaxis

**PEA AND confirmed COVID-19**
- If cardiac arrest suspected to be due to the disease AND ANY of:
  - Unwitnessed / no immediate CPR
  - Age ≥ 65 years
  - Dependent ADLs / major comorbidities
- Cease / withhold resuscitation

**Asystole AND confirmed COVID-19**
- If cardiac arrest suspected to be due to the disease:
- Cease / withhold resuscitation
Care Objective

- To ensure all patients receive a structured and comprehensive assessment of their health status that leads to their healthcare needs being addressed.

Intended patient group

- All patients

This CPG represents a minimum standard of assessment. If a full assessment is not completed or is deemed unnecessary the rationale **MUST** be documented.

Pre-arrival

Biases & human factors

- Cognitive bias and human factors have a significant impact on decision making and should be considered and discussed frequently throughout the entire process of patient care.
- Early diagnostic closure based on dispatch information presents a particular risk to patient safety.
- Patients from marginalised populations are at greater risk of harm from unconscious bias. These risks include low socioeconomic status, culturally and linguistically diverse, Aboriginal or Torres Strait Islander, substance affected, have a mental health related presentation or behaviours of concern.
- Human factors and their potential impact on patient care should be considered and acknowledged prior to arrival and throughout patient assessment:
  - Hungry
  - Angry
  - Late
  - Tired
  - Stressed

Assessment

*Information on the patient’s health status is collected in a structured, reproducible and comprehensive way.*

- Assessment is a cyclic process. Certain information may need to be prioritised upon initial assessment in high acuity patients or where urgent care is required (e.g. extreme pain). Where this is the case, a second or third cycle should involve more thorough and complete information collection.

Rapid assessment

- Immediate impression based on the presence of altered conscious state, increased work of breathing and obvious skin signs (e.g. diaphoresis, cyanosis) that informs:
  - The need for a formal primary survey
  - The urgency with which the patient should be assessed and the need for simultaneous collection of information
Primary survey

- If a patient deteriorates the default position should be to return to the primary survey for reassessment.

- **Exposure**: Refers to both exposing the patient for assessment (e.g. to locate possible major haemorrhage) and exposure to environmental conditions. Patient dignity should be maintained as much as possible while managing the risk of potential life-threatening conditions. Prevent hypothermia following exposure.

History of the presenting illness

- Avoid interrupting or redirecting the patient where possible during initial history taking.

- **Appears well / non-serious complaint**: Avoid concurrent vital signs and other assessment elements where possible to allow for uninterrupted, thorough history taking.

- **Appears unwell / serious complaint**: Concurrent assessment as required (e.g. 12 lead ECG in chest pain, SpO\textsubscript{2} in acute SOB).

Accountability and responsibilities

- All paramedics at scene are accountable for ensuring the patient receives appropriate and safe care. Where two paramedics attend a case, both should be present for assessment if possible to allow for shared decision making.

- **Attendant 1**: Assess the patient directly, taking the lead in history taking and physical examination.

- **Attendant 2**: Observes assessment and scene with minimal cognitive load, collects information and identifies missed information, errors or opportunities.

Vital signs & adjuncts

- BSL must be measured in patients with:
  - Altered conscious state
  - History of diabetes
  - Medical patients with undifferentiated acute illness

Physical examination

- **Focussed examination**: found in specific CPGs indicated for particular complaints (e.g. ACT-FAST/MASS, AEIOUTIPS, Spinal neurological examination, etc.)

- **General physical examination**: Any other physical assessment informed by the paramedic’s evolving understanding of the patient’s presenting illness

Social / Environmental factors

- May present a range of hazards and health risks which influence their care plan as much as the diagnosis or clinical problems.
Information related to the patient’s presentation is subjected to a process of critical analysis to identify and define the patient’s healthcare needs.

- **Diagnosis:** Any clinically useful characterisation of the patient’s health status that leads to a care plan that meets the patient’s needs. This includes a likely underlying pathology and/or a simple statement of clinical problems to be addressed.

- All stages of the diagnostic process should be discussed between AV staff and with the patient / family where possible and appropriate.

**Risk**

- The identification of risk and the subsequent escalation of care is more important than a precise diagnosis and allows for safe decision making where there is diagnostic uncertainty (this is expected to be frequent).

- Initial assessment captures a single moment in time. The patient’s trajectory or expected clinical course should be considered despite an unremarkable initial assessment.

**Differential Diagnosis**

- Diagnostic uncertainty is common and should be acknowledged. Where the underlying cause is uncertain, a care plan may be based on clinical problems (e.g. hypotension) and/or risks (e.g. elderly and frail).

**Clinical judgement**

- Clinical judgement is a subjective process to establish the most appropriate and accurate characterisation of the patient’s condition that leads to a safe and effective care plan.
  - Most appropriate diagnosis based on a balance of the urgency and likelihood of possible conditions
  - A hierarchy of clinical problems requiring management
  - The risks to patient safety

- Expert consultation and/or the escalation of care (e.g. transport) is recommended where clinical judgement does not lead to a satisfactory diagnosis, clinical problem and risk profile (e.g. staff on scene cannot agree).
A care plan that addresses the patient’s needs is developed, applied and evaluated.

- **Treatment:** Apply the appropriate CPG, CWI, direct care (e.g. wound dressing) or the patient’s own care plan as required (e.g. palliative patients, medically prescribed crisis medications)

**Escalation of care**

- Escalation of care should occur as soon as possible after recognition of deterioration. This may include transport to ED or specialist facility, MICA, HEMS, PIPER, expert consultation, etc.
- Family members / carers may be able to identify deterioration earlier in the patient’s course. Family / carer concern should be considered in decisions relating to escalation of care.
- Care can be escalated at any stage and for any reason at the judgement of the paramedic.

**Referral**

- A referral resource containing a summary of the assessment, care plan, safety netting and referral instructions **MUST** be provided and explained to the patient in all instances of non-transport including refusal.
- **Safety netting:** A plan to address unexpected but possible adverse events or deterioration. Apply the concept of safety netting in all patients who are not transported to hospital.
- A patient treated with the intention of referral away from ED must be reassessed prior to departure. If the patient has deteriorated or has not responded to treatment as expected, then revise the care plan and transport them to ED.

**Access to care**

- In order to be safe and effective, the care plan must be feasible and the patient must have access to the resources necessary to enact the plan. The following barriers should be considered:
  - Socio-economic status & health literacy
  - Logistic issues (e.g. opening times, transport)
  - Patient’s location in relation to health services
  - Linguistic or cultural barriers
  - Disability related barriers

**Reassessment**

- 15-minutely VSS reassessment is the minimum standard. Where it is impossible or clinically unnecessary, the rationale **MUST** be documented. Where a patient is considered unwell or deteriorates, reassessment should be performed more frequently and care escalated as appropriate.
- Reassessment should include:
  - $\text{SpO}_2$, HR, BP, RR, GCS and any other observation that was initially found to be abnormal (e.g. haemorrhage, pain, SOB)
  - The efficacy and safety of any treatments (e.g. tourniquets, CPAP, splint, thoracostomies, ETT)
Transfer of care

Continuity of care is supported through a seamless and safe transfer of care.

- Where the patient is referred into the community, the effective transfer of information from paramedics to other healthcare professionals is as important as handover in an ED.

- Attempt to make direct contact with the healthcare professional and include relevant information regarding the patient’s presentation in the referral resource.

- Avoid the transmission of bias to other healthcare professional by the use of biased language at handover or in documentation.
AV staff have a shared responsibility for all aspects of patient care, patient safety, and paramedic safety.

**Assessment**

**Pre-arrival**
- Plan for care
- Risks / human factors

**Dangers**
- PPE
- Dangers

**Rapid Assessment**
- Alertness
- Work of breathing
- Skin

**Well**
- Rapport
- Rest / position
- Reassurance

**Unwell**
- Primary Survey
  - R Response
  - A Airway
  - B Breathing
  - C Circulation
  - D Disability
  - E Exposure
  - Manage life-threatening findings as per appropriate CPG’s and CMRs
  - Early STILEP as required
  - Establish if limitation of treatment documented

**History**
- As appropriate:
  - Timeline
  - Nature
  - Prodromal symptoms
  - History of similar episodes
  - Associated circumstances
  - Aggravating / relieving factors

**VSS & Adjuncts**
- PSA
- RSA
- GCS/AWPU
- SpO2
- Temp
- ECG

**Past History**
- Medical conditions
- Medications
- Allergies
- Risk factors

**Secondary Survey**
- As appropriate:
  - Trauma secondary survey
  - Focused assessments (specific CPG)
  - General physical exam

**Social/environmental**
- Consider social / environmental factors
Diagnosis
Discuss each stage with other AV staff and patient where possible

Risk and Patient Safety
- Clinical red flags mandate transport
  - Summary findings and pertinent negatives
  - Identify and vet possible risk as per CPG A0105 Clinical flags / Patient Safety
  - Time critically as per CPG A0105 Time critical guidelines

Differential diagnosis
- Identify possible causes
- Refine list of possible causes
- Prioritize based on urgency and likelihood
- Identify provisional diagnosis and/or clinical problems

Clinical judgement
- Establish the best balance of the following that most accurately characterizes the patient’s presentation:
  - Risks
  - Diagnosis
  - Clinical problems

Care Pathways
The diagnosis, clinical problems and risks MUST account for all clinical findings

Plan
- Discuss possible care pathways / treatment options and risks / benefits
- Consent as per CPG A0111 Consent and capacity
- Decide and establish collective understanding of plan amongst AV staff and patient
- Prepare logistics, resources, task allocation and contingency planning as required
- Consider escalation as per CPG A0112 Ambulance Risk Assessment

The care pathway MUST address ALL risks, diagnoses and clinical problems

Implement
- Escalation of care (as required)
- Treatment
- Transport / Referral

Reassess
- Monitor trends (minimum 15 minute VSS)
- Identify deterioration and escalate care as required
- Review diagnosis and evaluate / adjust treatment

Transfer of care
- Handover (MIST/AMBO)
- Referral – complete Referral Resource and make direct contact with HCP where possible
These observations and criteria need to be taken in context with:

- The patient’s presenting problem.
- The patient’s prescribed medications.
- Repeated observations and the trends shown.
- Response to management.

BP alone does not determine perfusion status.

**Perfusion definition**

The ability of the cardiovascular system to provide tissues with an adequate oxygenated blood supply to meet their functional demands at that time and to effectively remove the associated metabolic waste products.

**Perfusion assessment**

Other factors may affect the interpretation of the observations made, including:

- ambient temperature
- anxiety
- any cause of altered consciousness.

### Perfusion status assessment

<table>
<thead>
<tr>
<th>Adequate perfusion</th>
<th>Warm, pink, dry</th>
<th>60 – 100 bpm</th>
<th>&gt; 100 mmHg systolic</th>
<th>Alert and orientated to time and place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borderline perfusion</td>
<td>Cool, pale, clammy</td>
<td>50 – 100 bpm</td>
<td>80 – 100 mmHg systolic</td>
<td>Alert and orientated to time and place</td>
</tr>
<tr>
<td>Inadequate perfusion</td>
<td>Cool, pale, clammy</td>
<td>&lt; 50 bpm or &gt; 100 bpm</td>
<td>60 – 80 mmHg systolic</td>
<td>Either alert and orientated to time and place or altered</td>
</tr>
<tr>
<td>Extremely poor perfusion</td>
<td>Cool, pale, clammy</td>
<td>&lt; 50 bpm or &gt; 110 bpm</td>
<td>&lt; 60 mmHg systolic or unrecordable</td>
<td>Altered or unconscious</td>
</tr>
<tr>
<td>No perfusion</td>
<td>Cool, pale, clammy</td>
<td>No palpable pulse</td>
<td>Unrecordable</td>
<td>Unconscious</td>
</tr>
</tbody>
</table>
## Respiratory Status Assessment

### Respiratory status assessment

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>Mild distress</th>
<th>Moderate distress</th>
<th>Severe distress (life threat)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General appearance</strong></td>
<td>Calm, quiet</td>
<td>Calm or mildly anxious</td>
<td>Distressed or anxious</td>
<td>Distressed, anxious, fighting to breathe, exhausted, catatonic</td>
</tr>
<tr>
<td><strong>Speech</strong></td>
<td>Clear and steady sentences</td>
<td>Full sentences</td>
<td>Short phrases only</td>
<td>Words only or unable to speak</td>
</tr>
<tr>
<td><strong>Breath sounds and chest auscultation</strong></td>
<td>Usually quiet no wheeze</td>
<td>Able to cough</td>
<td>Able to cough</td>
<td>Unable to cough</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Asthma:</strong> mild expiratory wheeze</td>
<td><strong>Asthma:</strong> expiratory wheeze, +/- inspiratory wheeze</td>
<td><strong>Asthma:</strong> expiratory wheeze +/- inspiratory wheeze, maybe no breath sounds (late)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>L VF:</strong> may be some fine crackles at bases</td>
<td><strong>L VF:</strong> crackles at bases - to mid-zone</td>
<td><strong>L VF:</strong> fine cracks - full field, with possible wheeze <strong>Upper Airway Obstruction:</strong> Inspiratory stridor</td>
</tr>
<tr>
<td><strong>Respiratory rate</strong></td>
<td>12 – 16</td>
<td>16 – 20</td>
<td>&gt; 20</td>
<td>&gt; 20 Bradypnoea (&lt; 8)</td>
</tr>
<tr>
<td><strong>Respiratory rhythm</strong></td>
<td>Regular even cycles</td>
<td><strong>Asthma:</strong> may have slightly prolonged expiratory phase</td>
<td><strong>Asthma:</strong> prolonged expiratory phase</td>
<td><strong>Asthma:</strong> prolonged expiratory phase</td>
</tr>
<tr>
<td><strong>Work of breathing</strong></td>
<td>Normal chest movement</td>
<td>Slight increase in normal chest movement</td>
<td>Marked chest movement +/- use of accessory muscles</td>
<td>Marked chest movement with accessory muscle use, intercostal retraction +/- tracheal tugging</td>
</tr>
<tr>
<td><strong>HR</strong></td>
<td>60 – 100 bpm</td>
<td>60 – 100 bpm</td>
<td>100 – 120 bpm</td>
<td>&gt; 120 bpm Bradycardia late sign</td>
</tr>
<tr>
<td><strong>Skin</strong></td>
<td>Normal</td>
<td>Normal</td>
<td>Pale and sweaty</td>
<td>Pale and sweaty, +/- cyanosis</td>
</tr>
<tr>
<td><strong>Conscious state</strong></td>
<td>Alert</td>
<td>Alert</td>
<td>May be altered</td>
<td>Altered or unconscious</td>
</tr>
</tbody>
</table>

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Glasgow Coma Scale

The GCS is an objective measure of consciousness. The score should not be estimated.

The principle in each category of the GCS is that the patient should receive the highest score in that category based on their response.

The application of painful stimuli should be performed in a professional manner as part of a clinical assessment.

Painful stimuli should not be repeatedly applied to a patient if the expected response is not elicited.

A low score on the GCS in isolation does not dictate the need for airway management. Airway management should be considered based on the clinical presentation, of which GCS is one part.

If the patient has clinical or social issues such as aphasia/dysphasia, facial injuries or language barriers then AVPU is an appropriate tool to assess consciousness.

<table>
<thead>
<tr>
<th>Eye opening</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous</td>
<td>4</td>
</tr>
<tr>
<td>To voice</td>
<td>3</td>
</tr>
<tr>
<td>To pain</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verbal response</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientated</td>
<td>5</td>
</tr>
<tr>
<td>Confused</td>
<td>4</td>
</tr>
<tr>
<td>Inappropriate words</td>
<td>3</td>
</tr>
<tr>
<td>Incomprehensible sounds</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>
Motor response

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Obeys command</td>
<td>6</td>
</tr>
<tr>
<td>Localises to pain</td>
<td>5</td>
</tr>
<tr>
<td>Withdraws to pain</td>
<td>4</td>
</tr>
<tr>
<td>Flexion to pain</td>
<td>3</td>
</tr>
<tr>
<td>Extension to pain</td>
<td>2</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

AVPU (Alert, Voice, Pain, Unresponsive)

AVPU is quick and simple to apply and is appropriate to determine conscious state whilst initial assessment is conducted and treatment is being established. A formal GCS should be undertaken in more complex presentations.

As a generalisation patients responding to voice correlate to an approximate GCS of 10 – 14, responding to pain GCS 7 – 9 and unresponsive patients will be below GCS 7. These approximations do not replace a formal GCS for advanced clinical decision making such as RSI.

AVPU is an appropriate assessment for both adult and paediatric patients, and is the preferred option for paediatric patients where adapting the GCS can be problematic.

When assessed, is the Pt:

<table>
<thead>
<tr>
<th>AVPU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>alert?</td>
<td>A</td>
</tr>
<tr>
<td>responds to voice?</td>
<td>V</td>
</tr>
<tr>
<td>responds to pain?</td>
<td>P</td>
</tr>
<tr>
<td>unresponsive?</td>
<td>U</td>
</tr>
</tbody>
</table>
The concept of the Time Critical patient allows the recognition of the severity of a patient’s condition or the likelihood of deterioration. This identification directs appropriate clinical management and the appropriate destination to improve outcome. Covered within the Time Critical Guidelines are:

- Triage decisions for a patient with major trauma.
- Triage decisions for a patient with significant medical conditions.
- Requests for additional resources including MICA and Aeromedical services.
- Judicious scene time management (e.g. should not exceed 20 minutes for non-trapped major trauma patient).
- Appropriate receiving hospital and early notification.

It is important to note that the presence of time criticality does not infer a directive for speed of transport, but rather the concept implies there be a “time consciousness” in the management of all aspects of patient care and transport.

## Time critical definitions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual</td>
<td>At the time the vital signs survey is taken, the patient is in actual physiological distress.</td>
</tr>
<tr>
<td>Emergent</td>
<td>At the time the vital signs survey is taken, the patient is not physiologically distressed but does have a pattern of injury or significant medical condition which is known to have a high probability of deteriorating to actual physiological distress.</td>
</tr>
<tr>
<td>Potential</td>
<td>At the time the vital signs survey is taken, the patient is not physiologically distressed and there is no significant pattern of actual Injury/illness, but there is a mechanism of injury/illness known to have the potential to deteriorate to actual physiological distress.</td>
</tr>
</tbody>
</table>

## Trauma triage

Patients meeting the criteria for major trauma should be triaged to the highest level of trauma care available within 45 minutes transport time of the incident in accordance with Victorian State Trauma System requirements and AV policies and procedures.

The receiving hospital must also be notified to ensure an appropriate reception team and facilities are available.

All maternity patients who meet the time critical trauma criteria, or any patient who is > 24 weeks gestation with any trauma or potential harm to the unborn child, should be transported to the Royal Melbourne Hospital if within 45 minutes. If > 45 minute travel time, transport to the nearest alternative highest level of trauma service. Pregnant women must not be taken to The Alfred Hospital unless in cardiac arrest and the Alfred is closest.
Mechanism of injury (MOI)

A patient under the Trauma Triage Guidelines meets the criteria for major trauma if they have a combination of MOI and other co-morbidities constituting:

- Systemic illness limiting normal activity / systemic illness constant threat to life. Examples include:
  - Poorly controlled hypertension
  - Obesity
  - Controlled or uncontrolled CCF
  - Symptomatic COPD
  - Ischaemic heart disease
  - Chronic renal failure or liver disease
- Pregnancy
- Age < 12 or > 55

Medical triage

Patients meeting the time critical criteria for medical conditions are regarded as having, or potentially having, a clinical problem of major significance. These patients are time critical and should be transported to the nearest appropriate hospital. Critically unwell patients who are pregnant should not be transported past a level 1 or level 2 ED to a primary obstetric facility. Transport all maternity patients who meet the medical time critical criteria to the nearest major emergency department capable of accepting a critically unwell adult patient and with some associated obstetric support. Ideally this will be an emergency department linked with a level 1 obstetric facility such as the Royal Melbourne ED (RWH), Austin ED (Mercy) or Monash Clayton. This should occur even if it is believed that the criticality is caused by a maternity condition e.g. ectopic pregnancy.
Pre-Hospital Vital Signs Major Trauma Criteria

In the setting of potential major trauma, an adult is considered time critical if they meet any of the following criteria:

- HR <50 or >120
- RR <10 or >30
- Systolic BP <90 mmHg
- SpO2 <90%
- If ≥16 years:
  - GCS <13
- If ≤15 years:
  - GCS <15

Does the patient have abnormal vital signs meeting the major trauma criteria?

No

Assess patient for specific injuries

Yes

Is the abnormal vital sign an isolated reduction in GCS in a patient age ≥65 years who suffered a fall <1m in the metropolitan region?

No

Transport to the highest level of trauma service within 45 minutes
(Paediatric major trauma service for patients aged ≤15 years)

Yes

Transport to the nearest Metropolitan Neurosurgical Facility
Specific Injuries Meeting Potential Major Trauma Criteria

- All penetrating injuries (except isolated superficial limb injuries)
- Blunt injuries
  - Serious injury to a single body region such that specialised care or intervention may be required or such that life, limb or long-term quality of life may be at risk
  - Significant injuries involving more than one body region
- Specific injuries
  - Limb amputation or limb threatening injury
  - Suspected spinal cord injury or spinal fracture
  - Burns >20%; TBSA >10% if ≤ 15 yrs or suspected respiratory tract burns
  - High voltage (>1000 volts) burn injury
  - Serious crush injury
  - Major compound fracture or open dislocation
  - Fracture to 2 or more of femur/fibula/humerus
  - Fractured pelvis

Does the patient have specific injuries meeting the potential major trauma criteria?

Transport to the nearest appropriate emergency care facility

Transport to the highest level of trauma service within 45 minutes
(Paediatric major trauma service for patients aged ≤ 15 years)
Almost half of Australians aged 16-85 will experience a mental health disorder at some point in their life. Mental health related cases comprise approximately 10% of the AV caseload.

The most effective way to ascertain if a patient is considering self-harm is to ask them directly. Questions such as “Are you thinking of killing yourself?” or “Have you thought about how you would do it?” helps to avoid misinterpretation and they do not encourage a person to engage in self-harm.

The Mental Status Assessment is a systematic method used to evaluate a patient’s mental function. In undertaking a mental status assessment, the main emphasis is on the person’s behaviour. This assessment is designed to provide Paramedics with a guide to the patient’s behaviour, not to label or diagnose a patient with a specific condition.

The Mental Status Assessment is to be used to indicate some of the clinical triggers that determine the necessity of a patient being transported to hospital. Mental health encompasses a varied range of conditions and presentations and these guidelines are not prescriptive for all complaints or statuses. It is expected that Paramedics will continue to use their clinical judgement for the most appropriate treatment options for this patient cohort.

Patients with a history of mental illness are overrepresented in mortality rates in a number of areas and should not be underestimated due to their underlying mental health history. If the patient has a primary complaint other than a mental health crisis then this should be assessed appropriately as per any other patient, with a conscious acknowledgement that the patient is at higher risk of death from a variety of causes if they are not treated seriously.

Patients demonstrating high-risk symptoms should not be considered for non-transport options. Consideration for police support should be made early if it is apparent that the patient is resistant to transport to an ED.

Patients meeting the criteria for needing immediate support may be considered for non-transport if the available options for further care are in both the patient and Paramedic’s judgement suitable to meet the needs of the patient and address the crisis. If the available care options are inadequate or unavailable then transport remains the default option.
### Assessment table

**LOOK FOR, LISTEN TO & ASK ABOUT ALL CATEGORIES BELOW**

*THE PATIENT MAY BE SUFFERING FROM SOME OF THE FOLLOWING EXAMPLES*

*Remember verbal de-escalation strategies, active listening and calm/open body language*

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Paramedic, patient and bystander safety is the first priority. Assess the scene for dangers i.e. location, weapon. Obtain police support early if required. Maintain vigilant reassessment of scene safety.</td>
</tr>
<tr>
<td>Appearance</td>
<td>Look for signs indicative of mental health issues or poor self-caring: uncleanliness, dishevelled, malnourished, signs of addiction (injection marks/nicotine stains), posture, pupil size, odour.</td>
</tr>
<tr>
<td>Behaviour</td>
<td>Patient may display: odd mannerisms, impaired gait, avoidance or avoidance of eye contact, threatening or violent behaviour, unusual motor activity or activity level (i.e. wired or buzzing), bizarre/inappropriate responses to stimuli, pacing.</td>
</tr>
<tr>
<td>Affect</td>
<td>Observed to be; flat, depressed, agitated, excited, hostile, argumentative, violent, irritable, morose, reactive, unbalanced, bizarre, withdrawn etc.</td>
</tr>
<tr>
<td>Speech</td>
<td>Take note of: rate, volume, quantity, tone, content, overly talkative, difficult to engage, tangential, flat, inflections etc.</td>
</tr>
<tr>
<td>Thought Process</td>
<td>May be altered, can be perceived by patient jumping irrationally between thoughts, sounding vague, unsteady thought flow when communicating verbally.</td>
</tr>
<tr>
<td>Cognition</td>
<td>May be exhibiting signs of impairment such as; poor ability to organise thoughts, short attention span, poor memory, disorientation, impaired judgement, lack of insight.</td>
</tr>
<tr>
<td>Thought Content</td>
<td>May be dominated by; delusions, obsessions, preoccupations, phobias, suicidal/depressed or homicidal thoughts, compulsations, superstitions.</td>
</tr>
<tr>
<td>Self-Harm</td>
<td>Ask patient directly if they have attempted self-harm, suicide or are thinking/planning for these. Ask about previous attempts.</td>
</tr>
<tr>
<td>Perceptions</td>
<td>Patient may be suffering from: hallucinations (ask specifically about auditory, visual and command hallucinations), disassociation i.e. ‘I feel detached from my body’, ‘my surroundings aren’t real’, ‘I am not in control of my actions’.</td>
</tr>
<tr>
<td>Environment</td>
<td>Risk factors include; lack of familial and social support, addiction or substance abuse, low socio-economic status, life experiences, recent stressors, sleeping problems or comorbidities (either physical or mental health conditions).</td>
</tr>
</tbody>
</table>
Care Objectives

• To accurately assess patient safety risk
• To transport patients who are at risk of deterioration or adverse outcome

General Notes

Intended patient group

• All patients
The Patient Safety Risks are a selection of general risk factors that should be considered as part of the Diagnostic Phase for all patients. No specific combination of risks mandates transport, but any patient judged to be at risk of deterioration or adverse outcome should be transported to hospital.

The presence of significant risk of any kind should outweigh an apparently benign diagnosis in determining the care plan.

Diagnostic uncertainty

Diagnostic uncertainty is a significant source of risk. The recognition of significant risk (i.e. where a diagnosis is uncertain or the patient otherwise presents an unacceptable level of risk independent of their diagnosis) should prompt a change in the care plan. This will frequently include transport to hospital.

Elderly / frail

- **Increased diagnostic uncertainty**: Elderly and frail patients have a higher risk of occult illness and atypical presentations.
- Communication barriers, challenges in accessing appropriate health services and social / environmental issues are also a source of risk in this group.
- **Increased risk of deterioration**: Elderly and frail patients typically have reduced coping capacity and physiological reserve.

Clinical course / deterioration

- Many patients will present without any obvious concerning findings at the time of assessment but may go on to deteriorate in a predictable way. In addition to the patient’s condition at the time of assessment, paramedics must consider the likely or possible clinical course and where the patient currently sits on that trajectory. An appropriate care plan may include transporting patients who do not have concerning findings at the time of assessment but who still present a reasonable risk of deterioration.

Bias and human factors

- Biases can influence assessment and decision making. No individual is immune to bias, but recognising and acknowledging that a bias is present can help to mitigate the impact on subsequent decisions.
- Patients with mental health problems, substance dependence and Aboriginal and Torres Strait Islanders are at particular risk of the unconscious bias of health care professionals.
Red Flags mandate transport. Where paramedics believe transport is not required, they must contact the AV Clinician.

The Red Flags are not an exhaustive list. Where patients present with abnormal vital signs that do not meet Red Flag criteria, staff are encouraged to maintain a high index of suspicion for serious illness. Similarly, there are other specific conditions that will require transport not listed here.

If a patient does not meet any Red Flags, but staff have a non-specific concern (“gut instinct”) about their health or welfare, the patient should be transported to ED.

The Red Flags do not indicate a need for MICA, however, any patient with deranged vital signs is at risk of deterioration. Escalation of care, including MICA, should be considered.

Ectopic pregnancy: Women of reproductive age presenting with any combination of pain in the abdomen/pelvis/shoulder tip/rectum, PV bleeding, or dizziness/syncope should be considered at risk of having an ectopic pregnancy.

Some patients will meet the abnormal vital sign criteria at initial presentation but will respond well to treatment, such as heroin overdose or hypoglycaemia. It is reasonable to treat these patients and reassess, with transport or non-transport decisions being based on subsequent sets of vital signs. If patients do not respond to treatment as expected, transport is required.

Yellow Flags do not mandate transport. However, patients with one or more yellow flags must be advised to attend hospital or GP within two hours via their own transport arrangements. If this is not possible for any reason, the other options to escalate care should be explored (e.g. Patient Transport or transport via emergency ambulance).

For the purposes of the Yellow Flags, “immunocompromised” includes:

- Chemotherapy or radiotherapy for cancer
- Organ transplant
- HIV / AIDS
- Rheumatoid arthritis therapies (other than NSAIDs)
Patient Safety Risk

Patients at risk of deterioration or adverse outcome if not transported must be taken to hospital by ambulance. Transport by other means may be appropriate in some circumstances.

Consider risk of diagnostic error:

- Diagnostic uncertainty
- Bias and human factors
- Elderly or frail (incl. age, comorbidities and baseline functioning)
- Communication difficulties (e.g. non-verbal, NESB, intellectual disability, developmental delay, dementia)
- Current drug or alcohol intoxication
- History of mental health problems
- Aboriginal or Torres Strait Islander
- Multiple comorbidities / complex medical history / ≥ 5 medications
- Rare medical condition
- Highly emotive scene

Consider risk of deterioration:

- Expected clinical course / trajectory
- Borderline vital signs
- Past history of falls, stroke, TIA, AF, anticoagulation
- Failure to respond to community based treatment as expected

Consider social / environmental risk:

- Risks to the safety of the patient
- Poor health literacy
- Adequate shelter and warmth

Consider access to care:

- The supply of required medications
- Ability to access necessary health services or further help if required
Red Flags

Patients meeting any of the following criteria must be transported to hospital by ambulance*. Consider notification.

- Abnormal vital sign

<table>
<thead>
<tr>
<th>HR bpm</th>
<th>RR breath / min</th>
<th>SBP mmHg</th>
<th>SpO₂</th>
<th>GCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 120</td>
<td>&gt; 30</td>
<td>&lt; 90</td>
<td>&lt; 90 %</td>
<td>&lt; 13 (&lt;15 if age ≤ 15 years)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unless chronic hypoxaemia</td>
<td></td>
</tr>
</tbody>
</table>

N.B. In the setting of trauma consider CPG A0105 Time Critical Guidelines (Trauma Triage)

Specific Conditions:

- Stridor
- First presentation seizure
- Anaphylaxis (including resolved or possible anaphylaxis or the post-adrenaline patient)
- Acute coronary syndrome (even if resolved)
- Ectopic pregnancy
- Primary obstetric issue
- Stroke / TIA
- Sudden onset headache
- Unable to walk (when usually able to walk)
- Post-tonsillecetomy bleeding (of any amount) up to 14 days post-operation

* Where the patient refuses transport or paramedics believe transport is not warranted, the AV Clinician must be contacted.
Yellow Flags

Patients meeting any of the following criteria must be advised to attend hospital or GP within two hours via own transport arrangements.

- Ongoing patient or carer concern
- Infection not responding to community based care (e.g. oral antibiotics)
- Immunocompromised with suspected infection (attend hospital with relevant history where appropriate)
- Surgical procedure within past 14 days
- Significant unexplained pain (e.g. ≥ 5)
- Syncope (asymptomatic, normal vital signs, normal ECG)
- Abdominal pain

AND patient must:

- Have capability to attend hospital / GP
- Be read Referral Advice Script

Referral Advice Script

"Our assessment indicates that you do not currently require transport to hospital in an emergency ambulance.

However, we believe you need to be reviewed by a medical doctor within the next two hours, and we would recommend that you attend your GP or the emergency department in your own vehicle.

If you are unable to do so on your own we will assist you."

This script does not remove the need to seek valid consent including a full explanation of the clinical findings, possible diagnosis, limitations of assessment, and any risks associated with a care pathway.

No flag criteria met

Where the patient does not meet any Red or Yellow Flags and is assessed as being suitable for non-transport, consider encouraging patient to see GP for follow-up within 48 hours.

Related Resources

- [CPG Walkthrough - Clinical Flags / Patient Safety](#)
1 Very Fit – People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age.

2 Well – People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally, e.g. seasonally.

3 Managing Well – People whose medical problems are well controlled, but are not regularly active beyond routine walking.

4 Vulnerable – While not dependent on others for daily help, often symptoms limit activities. A common complaint is being “slowed up”, and/or being tired during the day.

5 Mildly Frail – These people often have more evident slowing, and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework.

6 Moderately Frail – People need help with all outside activities and with keeping house. Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing.

7 Severely Frail – Completely dependent for personal care, from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~ 6 months).

8 Very Severely Frail – Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness.

9 Terminally Ill – Approaching the end of life. This category applies to people with a life expectancy <6 months, who are not otherwise evidently frail.

Scoring frailty in people with dementia

The degree of frailty corresponds to the degree of dementia. Common symptoms in mild dementia include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

In moderate dementia, recent memory is very impaired, even though they seemingly can remember their past life events well. They can do personal care with prompting.

In severe dementia, they cannot do personal care without help.
A) An ankle x-ray series is only required if there is any pain in malleolar zone and any of these findings:

1. bone tenderness at A
   OR
2. bone tenderness at B
   OR
3. inability to bear weight on both immediately and in ED

B) A foot x-ray series is only required if there is any pain in midfoot zone and any of these findings:

1. bone tenderness at C
   OR
2. bone tenderness at D
   OR
3. inability to bear weight on both immediately and in ED

Recommendations

Apply the Ottawa Ankle Rules accurately:
- palpate the entire distal 6cm of the fibula and tibia
- do not neglect the importance of medial malleolar tenderness
- do not use for patients under age 18

Clinical judgement should prevail; over the rules if the patient:
- is intoxicated or uncooperative
- has other distracting painful injuries
- has diminished sensation in the legs
- has gross swelling which prevents palpation of malleolar bone tenderness

Give written instructions and encourage follow-up in 5 to 7 days if pain and ability to walk are not better.
Consent and Capacity

Care Objectives

- To gain valid consent where possible
- To establish decision-making capacity where required
- To support the patient's right to make informed decisions regarding the care they receive

General Notes

Intended patient group

- All patients (or their legal guardian / medical treatment decision maker)

Emergency treatment

- Consent is not required to provide Emergency treatment that is needed urgently. Paramedics should still attempt to explain the treatment and reassure the patient where possible.
- While consent is not required, a patient with decision-making capacity may still refuse treatment in an emergency. This is expected to be very rare.
- **Agitation:** Sedation and restraint of the agitated patient constitutes emergency treatment. Where possible an attempt to de-escalate the situation should still occur.

Advance care directives (ACDs)

- If a patient does not have decision-making capacity, paramedics must make a reasonable effort in the circumstances to locate an ACD or a medical treatment decision maker. The amount of time spent doing this depends on the urgency of treatment and on clinical judgement.
- Treatment should not proceed if an ACD exists that specifically refuses that treatment, however emergency treatment should not be delayed to search for an ACD.
- Where an ACD is not immediately available, paramedics may accept, in good faith, advice from those present at the scene that a relevant ACD exists.
- Paramedics must comply with an ACD even if the patient’s condition is unrelated to any underlying condition for which the ACD was completed.
- An ACD refusing care does not apply where the patient has attempted suicide and in these circumstances paramedics should provide appropriate care including resuscitation.

Decision-making capacity

- Patients ≥ 18 years are presumed to have decision-making capacity unless there is evidence to the contrary.
- It cannot be assumed that a patient lacks decision-making capacity because paramedics believe the decision is unwise. In these cases, paramedics must explicitly establish that the patient has decision-making capacity and ensure that they are fully informed including the risks associated with their decision. This must be fully documented in the ePCR.

Patients < 18 years
• **Mature minor**: Considered to have decision-making capacity and may therefore consent to their own treatment.

• **Not a mature minor**: May not consent to their own treatment and consent must instead be sought from the child’s parent or guardian (or other person with parental responsibility).

• Whether a child is a mature minor depends on the capacity of the child to understand the nature and consequences of the required treatment.

• Where the patient is not a mature minor, attempt to contact the parent/guardian. Ideally they should accompany the patient to hospital.

• Emergency treatment can be provided without the consent of the child’s parent/guardian.

**Valid consent**

The consent offered by a patient with decision-making capacity (or a medical treatment decision maker) is considered valid if it is:

• **Voluntary**: Paramedics may outline what they believe to be the best course of action, but this cannot include undue pressure or coercion. Coercion includes any behaviours that may manipulate a patient’s decision-making but that are not a transparent and balanced description of clinical issues. Discouraging a patient from attending hospital by discussing waiting times or hospital delays is coercion and is specifically prohibited.

• **Informed**: Informed consent requires that the following information is presented in a balanced way to avoid coercion:
  
  — Results of assessment and implications of those results (this must include any abnormal clinical findings)
  — Diagnostic uncertainty and the limitations of prehospital assessment
  — Care pathway options including risks, benefits and implications of each
  — A recommended course of action if appropriate
  — Consequences of refusing a recommended treatment (where appropriate)

  Discussion of risks/benefits is proportionate to the situation and the relative likelihoods.

• **Relevant**: Consent should be specific to the context or procedure. Consent to one type of assessment or treatment does not constitute consent to another.

**Patients with mental illness**

• Consent is not required to transport compulsory patients or those apprehended by police under section 351 of the Mental Health Act.

• Compulsory/section 351 patients may still have the capacity to make decisions regarding other treatments. Where other treatment is required, the capacity to make decisions/give consent should be considered independently to their status as a compulsory patient.
Flowchart

Emergency treatment
Urgent treatment is required to:
• Save a life
• Prevent serious damage to health
• Treat significant pain or distress

Decision-making capacity
Can the patient:
• Understand the information relevant to the decision and the effect of the decision
• Retain that information to the extent necessary to make the decision
• Use or weigh that information as part of the process of making the decision
• Communicate the decision

Directive or certificate
Does the patient have an ACD or other certificate that relates to the specific treatment in question?

Medical treatment decision maker
Are any of the following persons reasonably available, willing and able to make a decision (in order of precedence):
• Appointed medical treatment decision maker
• Guardian appointed by VCAT
• Spouse or domestic partner
• Primary carer
• Adult child of patient
• Parent of patient
• Adult sibling of patient

None of the above is available
Act in the best interest of the patient

Consent not required
• Administer treatment (unless aware of ACD stating otherwise)

Gain consent
Valid consent must be:
• Voluntary
• Informed
• Relevant

Comply with patient’s wishes
• Do not provide any treatments specified by the directive or certificate
• Provide other care as appropriate

Gain consent
• Gain valid consent from appropriate decision maker

Related Resources

• CPG Walkthrough - Consent and Capacity
Care Objectives

- Preserve both paramedic and patient safety
- Select extrication techniques that are most clinically appropriate
- Early identification of extra resources required to safely move the patient

General Notes

Intended patient group: All adult and paediatric patients

Forming a plan

Manual handling support options
- Specialist manual handling resources
- Nearby crew
- Other services (SES, FSV)

Risk minimisation strategies
- **Sit / Stand / Walk Test**: Careful assessment of VSS, mobility, and patient presentation with each positional change.
- Where the patient can rest if required.
- Redundancy options: An alternative method to move the patient that will be employed if the original attempt fails.

The patient who improves

- High-acuity patients who respond to treatment will still require extrication assistance regardless of how well they have progressed with initial therapy.

The patient who deteriorates

- Assessment is continuous and the plan may need to change if the patient’s condition changes during extrication.
- Patients initially assessed to have an Increased Risk or no risk factors may require escalation to a higher risk category if decreased capability becomes evident with attempts to ambulate.
- Accordingly, the deteriorating patient will require a more conservative extrication plan.

Specific circumstances

- Some conditions have specific advice regarding optimal patient position and movement considerations, for example, hyper- and hypothermic patients and patients with a diving-related illness.
- This advice should be followed in conjunction with the principles contained within this CPG.
Flowchart

**Status**
Planning patient extrication

**Increased Risk**
- **Perfusion:** Borderline
- **Baseline Mobility:** Impaired
- **Specific condition:**
  - Drug or alcohol use
  - Medication administration (e.g. opioids)
  - Cognitive impairment
  - Neurological pathology
  - History of falls
  - New or pre-existing injury
  - Frail or requires mobility aid
  - Morbid obesity

**Action**
- Aim to extricate supine or sitting

**High Risk**
- **Perfusion:**
  - Inadequate or extremely poor, or
  - Significant postural changes in BP and/or HR
- **Baseline Mobility:** Poor
- **Specific condition:**
  - Anaphylaxis
  - Acute respiratory presentation
  - Acute coronary syndrome / STEMI

**Stop**
There is a high risk of deterioration or injury if patient is walked

**Action**
- Extricate supine or sitting (as appropriate for presentation)

**All Patients**
**Action**
Pause and plan:
- Request manual handling support if required
- In complex egress situations, if risk to patient is acceptable, consider Sit / Stand / Walk test and limit walking / exertion
  - Provide redundancy options in case ambulation fails
This CPG should only be applied to patients aged ≥ 12 years.

**Mx principles**

- O₂ is a treatment for hypoxaemia, not breathlessness. O₂ has not been shown to have any effect on the sensation of breathlessness in non-hypoxaemic patients.

- Treatment is aimed at achieving normal or near normal SpO₂ in acutely ill patients. O₂ should be administered to achieve a target SpO₂ while continuously monitoring the patient for any changes in condition.

- O₂ should not be administered routinely to patients with normal SpO₂. This includes those with stroke, ACS and arrhythmias.

- In patients who are acutely short of breath, the administration of O₂ should be prioritised before obtaining an O₂ saturation reading. O₂ can later be titrated to reach a desired target saturation range.

- If pulse oximetry is not available or unreliable, provide an initial O₂ dose of 2 - 6 L/min via nasal cannulae or 5 - 10 L/min via face mask until a reliable SpO₂ reading can be obtained or symptoms resolve.

**Special circumstances**

- Early aggressive O₂ administration may benefit patients who develop critical illnesses and are haemodynamically unstable, such as cardiac arrest or resuscitation; major trauma / head injury; shock; severe sepsis; and anaphylaxis. In the first instance, O₂ should be administered with the aim of achieving an SpO₂ of 100%. Once the patient is haemodynamically stable, the O₂ dose should be titrated to 92 - 96%.

- Patients with chronic hypoxaemia (e.g. COPD, neuromuscular disorders, obesity etc.) who develop critical illnesses as above should have the same initial aggressive O₂ administration. Once the patient is haemodynamically stable, the O₂ dose should be titrated to the same target saturations as other critically ill patients.

- COPD should be suspected in any patient over 40 years old who is: a smoker or ex-smoker, experiencing dyspnoea that is progressive, persistent and worse with exercise, has a chronic cough or chronic sputum production, has a family history of COPD.

- Special circumstances occur in the setting of paraquat and bleomycin poisoning where the use of O₂ therapy may prove detrimental to the patient. The maintenance of prophylactic hypoxaemia in these patients (SpO₂ of 85 - 88%) is recommended.

**Further Notes**

- Pulse oximetry may be particularly unreliable in patients with peripheral vascular disease, severe asthma, severe anaemia, cold extremities or peripherally 'shut down', severe hypotension and carbon monoxide poisoning.

- Pulse oximetry can be unreliable in the setting of severe hypoxaemia. An SpO₂ reading below 80%...
increases the chance of being inaccurate.

- All patients suspected of having inhaled potentially toxic gases (e.g. house fires, carbon monoxide poisoning, etc.) should be given high dose O₂ until arrival at hospital. In these clinical situations, patients who show no signs of breathlessness may still benefit from this treatment.

- Where the patient may have been exposed to other poisons, administer O₂ to maintain an SpO₂ of 92-96%. Poisons information can be contacted via the clinician on 13 11 26.

- Patients with medically diagnosed pneumothorax, but without an intercostal catheter in situ, may benefit from high dose O₂ regardless of SpO₂.

- Irrespective of SpO₂, patient tidal volume should be assessed to ensure ventilation is adequate.

- O₂ exchange is at its greatest in the upright position. Unless other clinical problems determine otherwise, the upright position is the preferred position when administering O₂.

- Ensure the patient’s fingertip are clean of soil or nail polish. Both may affect the reliability of the pulse oximeter reading. The presence of nail infection may also cause falsely low readings.

- Take due care with patients who show evidence of anxiety/panic disorders (e.g. hyperventilation syndrome). O₂ is not required however no attempt should be made to retain CO₂ (e.g. paper bag breathing).

- All women with evidence of hypoxaemia who are more than 20 weeks pregnant should be managed with left lateral tilt to improve cardiac output.

- Face masks should not be used for flow rates < 5 L/min due to the risk of CO₂ retention.

- Nasal cannulae are likely to be just as effective with mouth-breathers. However, where nasal passages are congested or blocked, face masks should be used to deliver O₂ therapy.
Flowchart

**Status**
- Evidence of hypoxaemia
- Breathlessness

**Assess / Consider**
- Acute or chronic?
- Respiratory Status
- Assess and monitor \( \text{SpO}_2 \) continuously
- Consider causes of hypoxaemia
- Bleomycin and parapquat poisoning - see special note

**Adequate \( \text{SpO}_2 \)**
- \( \text{SpO}_2 \geq 92\% \)

**Action**
- No \( \text{O}_2 \) required
- Reassure Patient

**Mild-moderate hypoxaemia**
- \( \text{SpO}_2 \) 85 – 91%
- **Action**
  - Titrate \( \text{O}_2 \) flow to \( \text{SpO}_2 \) of 92 – 96%
    - Initial dose of 2 – 6 L/min via nasal cannulae
    - Consider simple face mask 5 – 10 L/min

**Severe hypoxaemia**
- \( \text{SpO}_2 < 85\%
- **Critical illnesses**
  - Cardiac arrest or resuscitation
  - Major trauma/head injury
  - Shock
  - Severe sepsis
  - Anaphylaxis
  - Status epilepticus
  - Ketamine sedation
- **Action**
  - **Stop**
    - High-concentration \( \text{O}_2 \) may be harmful in the COPD Pt at risk of hypercapnic respiratory failure
  - **Action**
    - \( \text{O}_2 \) via nonrebreather mask 10 – 15 L/min

**Chronic hypoxaemia**
- COPD
- Neuromuscular disorders
- Cystic Fibrosis
- Bronchiectasis
- Severe kyphoscoliosis
- Obesity
- **Action**
  - Titrate \( \text{O}_2 \) flow to \( \text{SpO}_2 \) of 88 – 92%
  - If no critical illness present
    - Initial dose of 2 – 6 L/min via nasal cannula
    - Consider simple face mask 5 – 10 L/min
  - If Pt deteriorates or \( \text{SpO}_2 \) remains < 85%
    - \( \text{BVM} \) ventilation with 100% \( \text{O}_2 \)
    - Consider SGA as per CPG A0001
    - Supra-Glottic Airway
    - Consider ETT as per CPG A0002

**Regardless of \( \text{SpO}_2 \)**
- Toxic inhalation exposure
- Decompression illness
- Cord prolapse
- Postpartum haemorrhage
- Shoulder dystocia
- Cluster headache
- **Action**
  - \( \text{O}_2 \) via nonrebreather mask 10 – 15 L/min

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Care Objectives

- **High-Performance CPR**: Commence immediately and maintain with minimal chest compression interruption
- **Rapid defibrillation** of VF / Pulseless VT (*if in doubt*, shock)
- 2-minute rotations and rhythm checks

General Notes

**Ratio of compressions to ventilations**

No ETT/SGA

- 30 compressions : 2 ventilations
- Pause for ventilations

ETT/SGA insitu

- 15 compressions : 1 ventilation
- 6-8 ventilations per minute
- No pause for ventilations

**Medical Cardiac Arrest**

- **If any doubt exists as to the presence of a pulse**, chest compressions must be commenced
- Carotid pulse checks are only required for a potentially perfusing rhythm i.e. the presence of QRS complexes which may be accompanied by a rise in EtCO₂
- A **supra-glottic airway** is an appropriate option to manage the airway initially and to facilitate continuous compressions. When **ETT** is attempted, it should not interrupt compressions
- **EtCO₂** can be used as a surrogate marker of cardiac output and may approach physiological values with high quality CPR
- A gradual fall in EtCO₂ may suggest CPR fatigue
- **Fluid administration** in shockable rhythms may be detrimental and should be limited to medication flush and TKVO only
- Where clear signs of prolonged cardiac arrest are present, or continued resuscitation may be futile, consider **CPG A0203 Withholding or Ceasing Resuscitation**

**High-Performance CPR**

- **Time to first defibrillation ≤ 2 minutes**
- **Perform high-quality CPR:**
  - Rate: 100 - 120 compressions per minute
Depth: ≥ 5 cm, allow for full recoil
Ventilation duration: 1 second per ventilation
2 minute rotations of compressor

• Minimise interruptions to chest compressions ≤ 3 seconds
  Focus on team performance and communication
  Charge defibrillator during compressions
  On-screen rhythm analysis
  Hover hands over chest and resume compressions immediately after defibrillation or disarm

• Utilise Team Leader and checklist

Mechanical CPR (mCPR)

• High-Performance CPR with minimal interruptions to chest compressions is the initial priority in cardiac arrest

• mCPR should not occur prior to 16 minutes into the resuscitation unless in the setting of inadequate resources (i.e. < 3 CPR trained rescuers) or crew fatigue affecting compression quality

• Minimise interruptions to compressions by using communication, planning and teamwork to apply the device

• ROSC: If immediately available but not yet in situ, apply mCPR device in anticipation of potential re-arrest

• Transport with mCPR (if immediately available) if ALL of the following criteria are met:
  Paramedic-witnessed arrest OR presenting rhythm VF/VT refractory to initial Rx
  Likely reversible with medical intervention
  Pt ≤ 65 years old and lives independently
  Alfred Hospital ≤ 60 min from collapse (patients aged 15 - 35), OR
  ECMO or PCI ≤ 45 min from collapse (patients aged 36 - 65)

• Continue other standard cardiac arrest care

• Transporting patients in cardiac arrest without mCPR is associated with poorer outcomes and risks paramedic safety

Pregnant Patient > 20 weeks

• If the patient is pregnant with a known or suspected gestation > 20 weeks and mCPR is available, continue resuscitation and transport for consideration of resuscitative hysterotomy. The uterus should be pushed to the left side during transport to minimise aorto-caval compression (rather than tilting the entire patient to the left)

CPR-interfering patient

• Where the patient interferes with CPR, or gag reflex is present, or the patient is suspected to be aware during resuscitation (with the exception of minor isolated movements e.g. eye rolling) consider:
  ALS: Fentanyl 25 mcg IV Repeat every 3-5 minutes as required
  MICA: Ketamine 20 mg IV/IO Repeat every 3-5 minutes as required
Hypoxic cardiac arrest < 30°C

- The primary goal is to prevent further heat loss prior to ROSC or transport - significant improvement in temperature from prehospital intervention is unlikely
- Double the interval for Adrenaline and Amiodarone doses
- Greater than 3 shocks is unlikely to be successful while patient remains severely hypothermic - consider AAV, mCPR for transport. Where these resources are not available, continue DCCS as per standard cardiac arrest
- For patients in cardiac arrest where hypothermia is clearly the cause, mCPR to hospital may be appropriate in consultation with the Clinician and receiving hospital

PEA reversible causes

- Tension pneumothorax
- Upper airway obstruction
- Exsanguination
- Asthma
- Anaphylaxis
- Hypoxia

- Tension pneumothorax
  - Where tension pneumothorax is considered to be the cause of cardiac arrest, in either medical or traumatic arrest, decompress chest bilaterally as per CPG A0802 Chest Injuries
  - Chest decompression should not be routine in medical cardiac arrest

- TCA overdose
  - Administer Sodium Bicarbonate 8.4% 100 mL IV/IO
  - Sodium bicarbonate should not be routinely administered outside of the setting of hyperkalaemia or TCA overdose

- Hyperkalaemia
  - Suspect hyperkalaemia where the patient has a Hx of renal failure / dialysis or presents with significant crush injury
  - Administer Sodium Bicarbonate 8.4% 100 mL IV / IO and Calcium Gluconate 10% 2.2 mmol (1 g) IV (slow push)
  - Flush with 10 mL Normal Saline between administration of Sodium Bicarbonate and Calcium Gluconate.
  - Sodium bicarbonate should not be routinely administered outside of the setting of hyperkalaemia or TCA overdose

- Hypovolaemia / anaphylaxis / asthma
  - In PEA arrest where hypovolaemia, anaphylaxis or asthma is suspected or the patient has a rhythm that may be fluid responsive, administer Normal Saline 20 mL/kg IV/IO

- Hypoglycaemia
Hypoglycaemia in cardiac arrest is rare. However, BGL should be measured and hypoglycaemia treated as per CPG A0702 Hypoglycaemia. All other management to be prioritised above BGL measurement.
Major haemorrhage control over all other interventions
Management of correctable causes in order of clinical need:

- Oxygenation / ventilation
- Exclusion of tension pneumothorax by insertion of bilateral intercostal catheters
- Administration of Normal Saline 20mL/kg IV/IO

Standard cardiac arrest management including rhythm check following the trauma priorities

Consider medical cause: In cases where the Hx, MOI or injuries are inconsistent with traumatic cardiac arrest, or patient is in VF / VT

If any doubt exists as to the cause of arrest, treat as per Medical Cardiac Arrest

Control of major haemorrhage can be achieved with tourniquets, haemostatic dressings and/or direct pressure

Undifferentiated blunt trauma: A pelvic splint should be applied after other interventions. Where pelvic fracture is clearly contributing to cardiac arrest, a pelvic splint may be applied earlier

Traumatic cardiac arrest: if the presenting rhythm is asystole, consider early cessation of resuscitation once reversible causes have been managed and the patient remains in asystole.

In the setting of penetrating trauma and PEA arrest, emergency thoracotomy is a priority over standard traumatic cardiac arrest management when it can be performed within 20 minutes of collapse. If transport to a MTS is achievable in this timeframe then do not delay this for MICA, IV or ETT insertion. Compressions are not required during transport.

Cardiac arrest in the setting of severe crush injury should be managed with Sodium Bicarbonate 8.4% and Calcium Gluconate 10% as per CPG A0201 Cardiac arrest medical - “Hyperkalaemia”.

Traumatic Cardiac Arrest

Care Objectives

General Notes

Traumatic Cardiac Arrest

General Notes
Flowchart

Traumatic cardiac arrest
- Hx, MOI or injuries do not suggest medical cause of cardiac arrest

Major haemorrhage
- Prioritise control of major haemorrhage over all other interventions

Prioritise treatment of correctable causes of cardiac arrest over chest compressions and in order of clinical need

Action

Airway
- Ensure patent airway, oxygenation and ventilation
- Supra-Glottic airway
- ETT if required or proceed directly to cricothyroidotomy where trauma prevents other airway Mx

Action

Tension pneumothorax
- Where accredited, decompress chest bilaterally

Action

Volume replacement
- IV Access
- Normal Saline 20 mL/kg IV
- Normal Saline 20 mL/kg IV/IO

Cardiac arrest persists despite addressing correctable causes

Action

- Treat as per CPG A0201 Adult Cardiac Arrest - Medical including chest compressions and adrenaline
Excessive fluid administration during the intra-arrest and post-ROSC period may be detrimental. Judicious administration of fluid may be especially important in VF/VT. The total volume of fluid administered during cardiac arrest and post-ROSC management, including RSI, should not exceed 20 mL/kg unless correcting suspected hypovolaemia.

Where the cause of arrest is unclear, paramedics should assume a cardiac cause and transport to a PCI capable facility where possible.

Where resources allow and other priorities have been addressed, BGL should be measured post ROSC and hypoglycaemia treated as per CPG A0702 Hypoglycaemia.
Mass casualty incidents are in part characterised by the available resources being overwhelmed by larger patient numbers. Where this is the case, the AV Emergency Management Unit provides trauma triage guidelines for patient assessment that may differ significantly from guidelines used in other situations.

Injuries incompatible with life are those where survival is impossible (e.g. decapitation, incineration, cranial and cerebral destruction, hemicorporectomy) and should be combined with the absence of signs of life in order to withhold resuscitation. This is distinct from injuries that the paramedic believes are not survivable due to severity. Traumatic cardiac arrest outcomes are not futile.

In unwitnessed arrests (i.e. not seen or heard to arrest), an initial rhythm of asystole is associated with extremely high morbidity and mortality. In these cases resuscitation should be withheld if the estimated downtime between collapse and arrival of the first ambulance (or first responder) exceeds 10 minutes. Bystander CPR alone does not improve outcomes in this population and is not considered a compelling reason to continue.

Poor prognostic factors in cardiac arrest include unwitnessed arrest, no prior bystander CPR and duration of arrest exceeding 30 minutes.

**Advanced Care Directives**

- Ambulance Victoria supports a person’s right to articulate wishes for medical treatment and care in advance through an Advance Care Directive.
- A paramedic may provide or withhold treatment based upon the patient’s wishes as recorded on an Advance Care Directive that is sighted by them or paramedics may accept, in good faith, the advice from those present at the scene of the patient’s wishes and that this supporting documentation exists.
- A patient’s Advance Care Directive must be followed even where the emergency is not directly related to a preexisting illness. If the person’s wishes are unknown or there is doubt about the documentation or its existence, paramedics are to provide routine care.
- Paramedics are required to include discussions of patient’s wishes and decisions in their documentation.

**Voluntary Assisted Dying**

In Victoria, patients with a terminal diagnosis may choose to undertake Voluntary Assisted Dying (VAD) The medication used will be a barbiturate that leads to deep sedation and respiratory depression. In most patients, death from respiratory depression occurs within one hour after oral ingestion.

In the unlikely event that AV attends a patient who is actively involved in a VAD case, it is important to note:

- There will be a documented instructional Advance Care Directive for "no resuscitation".
- Family members or other health professionals (including paramedics) are not permitted to assist in the administration of the VAD medicine.
- Attending staff are not to administer active clinical therapy or resuscitation such as oxygen therapy, assisted ventilation or IV drug / fluid administration.
Withholding or Ceasing Resuscitation

- Supportive care such as positioning and other comfort measures are encouraged.

If the dying process is prolonged, paramedics / remote area nurses are encouraged to contact the patient’s specialist VAD doctor or the palliative care team. If this is unsuccessful, and the family require support, transport to hospital may be required. If in doubt, contact AV Clinician for advice.

Flowchart

- Mass casualty situation?
  - Action: Refer to AV Emergency Response plan and triage appropriately

- Compelling reasons to withhold resuscitation
  - Any patient with an advance care directive to not commence resuscitation
  - Obvious death:
    - Injuries incompatible with life
    - Rigor mortis
    - Post mortem lividity
    - Putrefaction/decomposition
    - Death declared by a doctor who is or was at the scene
  - Action: Do not commence resuscitation
  - Confirm determinants of death and consider Verification of Death form

- No prospect of resuscitation
  - Prolonged cardiac arrest:
    - Asystole is the presenting rhythm
    - Estimated time from collapse to AV First Responder attendance > 10 mins
  - Action: Do not commence resuscitation
  - Confirm determinants of death and consider Verification of Death form

- Cessation of resuscitation
  - PEA/Asystole
    - Adult who has received 30-45 mins of ALS resuscitation with no compelling reason to continue.
    - Ventricular Fibrillation
      - Adult who has received 45 mins of ALS resuscitation, cannot be transported with mechanical CPR and no other compelling reason to continue, but remains in VF
      - Compelling reasons depend on clinical judgement and may include:
        - Signs of life including pupil reaction, agonal or gasping respirations
        - Periods of ROSC
        - Youth and/or the absence of co-morbidities
  - Action: Cease resuscitation
  - Confirm determinants of death and consider Verification of Death form
## Verification of Death

- Verification of Death refers to ‘establishing that a death has occurred after thorough clinical assessment of a body’.

- Qualified Paramedics can provide verification if in the context of employment and if there is certainty of death. Providing verification of death is not mandatory for Paramedics.

- Certification of death must still ultimately be provided by a Medical Practitioner as to cause of death. This falls outside the scope of verification of death.

- Clinical assessment of a deceased person includes 6 clinical elements. These are the ‘determinants of death’:
  - No palpable carotid pulse.
  - No heart sounds heard for 2 minutes.
  - No breath sounds heard for 2 minutes.
  - Fixed (non-responsive to light) and dilated pupils (may be varied from underlying eye illness).
  - No response to centralised stimulus (supraorbital pressure, mandibular pressure or sternal pressure).
  - No motor (withdrawal) response or facial grimace to painful stimulus (pinching inner aspect of elbow or nail bed pressure).

N.B. ECG strip that shows asystole over 2 minutes is a seventh and optional finding that may be included. Ideally the determinants of death should be evaluated 5 - 10 minutes after cessation of resuscitation to ensure late ROSC does not occur.

- The Verification of Death form should include all findings along with the full name of person (if known), location of death, estimated date and time of death (if known), name of the Paramedic conducting the assessment and if the treating doctor has been notified.

- Police must be notified in cases of reportable or reviewable death with the attending crew remaining on scene until their arrival. Cases of SIDS are considered reportable.

- A reportable death would include unexpected, unnatural or violent death, death following a medical procedure, death of a person held in custody or care (alcohol or mental health), a person otherwise under the auspice of the Mental Health Act but not in care or a person unknown.

- A reviewable death is required following death of a child (< 18 years) where the death is the second or subsequent death of a child of the parent, guardian or foster parent.

- The original Verification of Death form should be left with the deceased and the copy attached to the printed PCR.
A supra-glottic airway (SGA) provides improved airway and ventilation management compared to a bag-valve-mask and OPA. It does not offer the same level of protection against aspiration as intubation, however is it often quicker and easier to insert and may be an appropriate initial method of managing the airway.

If an SGA is placed, the insertion of an oro-gastric tube may provide benefit in decompressing the stomach and allowing drainage of gastric contents.

In the setting of cardiac arrest, insertion of an oro-gastric tube must not delay or interfere with higher priority actions such as uninterrupted compressions or defibrillation.

Patients who require higher airway pressures e.g. pregnancy, morbid obesity, decreased pulmonary compliance (pulmonary fibrosis) or increased airway resistance (severe asthma) should be carefully monitored to ensure effective ventilation is being achieved and passive regurgitation avoided.

If an SGA is inserted, ventilation proves difficult or inadequate and trouble-shooting fails to correct the issue, consider removing the SGA if ventilation is possible through another airway management plan.

Three attempts in total at SGA insertion are permitted irrespective of skill-set (ALS, MICA, MFP). If difficulty is encountered in the placement of an SGA, problem solving aimed at improving the chance of success should occur prior to subsequent attempts.
Flowchart

**Status**
- Unconscious Pt without gag reflex
- Ineffective ventilation with BVM and basic airway Mx
- > 10 minutes assisted ventilation required
- Unable to intubate

**Stop**
- Contraindications
  - Intact gag reflex or resistance to insertion
  - Strong jaw tone or trismus
  - Suspected epiglottitis or upper airway obstruction

**Consider**
- Precautions
  - Inability to prepare the Pt in the sniffing position
  - Pts who require high airway pressures
  - Paediatric Pts who may have enlarged tonsils
  - Vomit in the airway
- Side effects
  - Correct placement does not prevent passive regurgitation or gastric distension

### i-gel quick reference guide

<table>
<thead>
<tr>
<th>I-gel size</th>
<th>Pt weight guide*</th>
<th>Max size of gastric tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2 – 5 kg</td>
<td>N/A</td>
</tr>
<tr>
<td>1.5</td>
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<tr>
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<td>25 – 35 kg</td>
<td>12</td>
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<tr>
<td>3.0</td>
<td>30 – 60 kg</td>
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</tr>
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<td>4.0</td>
<td>50 – 90 kg</td>
<td>12</td>
</tr>
<tr>
<td>5.0</td>
<td>90+ kg</td>
<td>14</td>
</tr>
</tbody>
</table>

*This is a guide only. Please ensure correct size is chosen corresponding to Pt airway size.

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Care Objectives

- Ensure safe and effective airway management throughout entire episode of care.

General Notes

Intended patient group

- Patient ≥ 12 years of age.

Risk-benefit analysis

- A dynamic risk-benefit analysis is required for every prehospital intubation and should include evaluation of any precautions alongside the clinical context. Prehospital RSI may cause patient harm.
- Minimising scene times should be prioritised over the decision to perform prehospital RSI.
- Physiological derangement refractory to or requiring significant resuscitation, such as hypotension, hypoxia and/or metabolic acidosis may be exacerbated by RSI and precipitate cardiac arrest.
- In rural and regional areas RSI may be undertaken or withheld by single-responder MICA Paramedics following consideration of risk-benefit analysis.

Rapid Sequence Intubation (RSI)

Medication

- Ketamine is the preferred sedation induction agent for all RSI unless contraindicated by BP > 180 mmHg in the setting of NTBI.
- Fentanyl and Midazolam dosage should be based on assessment of cardiovascular and frailty status at the time of RSI.
- Patients with traumatic brain injury should receive hemodynamic support via Normal Saline 10 mL/kg during preparation for RSI, however administration must not delay RSI.
- Calculated Ketamine and Rocuronium doses should be rounded up to the nearest 10 mg.
- Avoid Fentanyl and Ketamine administration in the setting of serotonin syndrome/hyperthermia by using Morphine and Midazolam to facilitate RSI.

Delayed Sequence Intubation (DSI)

- This pathway is intended for patients with respiratory failure and/or combativeness preventing pre-oxygenation.
- In these cases, optimisation of oxygen saturation is the goal prior to paralytic administration (as opposed to normalisation).
- The only sedation medication approved for DSI is Ketamine. It should be administered via slow IV push to preserve airway reflexes and maintain respiratory rate.

Capnography

- The recording of pre- and post-intubation capnography is necessary to accurately describe the
therapeutic effect of ETT placement. Post-intubation capnography is essential for confirmation of tracheal placement and must be noted by all paramedics. If there is any doubt about tracheal placement the ETT must be immediately removed.

The extremely combative patient

- Pre-RSI combativeness in TBI should be managed judiciously with analgesia as per CPG A0501 Pain Relief.
- In rare cases, IM or IV Ketamine may be required for control of a combative patient who endangers crew and prevents full assessment.

The hypertensive patient

- In the absence of any precautions, Ketamine may be considered in the setting of severe hypertension BP > 180mmHg (e.g. asthma or severe pain aetiology such as burns).
- Ketamine is the ideal agent for RSI in patients with burns. Expect high BP in this patient group and manage with aggressive opioid analgesia prior to RSI. If BP remains > 180mmHg, RSI with Ketamine is still appropriate.

Unassisted intubation

- Unassisted intubation is permitted in patients with a GCS of 3 where there are no airway reflexes present, excluding TBI / NTBI.
- Unassisted intubation is permitted in the setting of pre- and peri-arrest multi-trauma with TBI and no airway reflexes, however transport unintubated is preferred.
- In this cohort, gentle laryngoscopy should be undertaken during intubation attempts and suction prepared. ETI should be abandoned if airway reflexes interfere with laryngoscopy or intubation.
- Unassisted intubation is not a shortcut. Prepare and anticipate the need for rapid post ETT sedation and paralysis.
Flowchart - Indications & Preparation

**Indication**
- Airway not patent
  - Inability to support own airway such that ongoing airway maintenance and/or clearance is required
- Respiratory failure
  - Refractory to non-invasive ventilation and medications
  - OR
  - Requiring ongoing assisted manual ventilation
- Targeted treatment required
  - E.g. status epilepticus, refractory hyperthermia, TCA overdose, TBI, ROSC, airway burns

**Precautions**
- Baseline neurological function, significant comorbidities or advanced care directive may preclude intubation
- Anticipated difficult BVM or intubation (e.g., situation, anatomical, physiological, resourcing)
- Intubation is likely to cause harm in hypovolemic shock and multitrauma (including TBI)
- Scene delay for RSI may be harmful where there is need for rapid in-hospital management
- Avoid RSI in the setting of severe hypothermia < 30°C

**Risk v Benefit Analysis**
- Is prehospital intubation the most appropriate management for this patient?

**Preparation**
- Medications prepared
- Laryngoscope + blade × 2
- Video laryngoscope
- ETT + 1 smaller
- Introducer / stylet
- Difficult airway setup
- Suction tested

**Position**
- Optimise environment
- Optimise patient position - “ear to sternum”
- C-spine considerations

**Perfusion**
- IV / IO access × 2
- Prehydration
- Consider TPT
- Blood pressure optimised
- Adrenaline bolus prepared

**Pre-oxygenation**
- BVM with 5 cmH₂O PEEP and FIO₂ 1
- Note ETCO₂ reading and confirm functional
- Apnoea oxygenation via nasal cannula @ 15 L/min

**People**
- Ensure adequate crew resources
- Identify team leader
- Allocate roles
- Briefing
- Complete RSI Checklist
Flowchart - Procedure

- **Status**
  - Patient prepared for intubation

- **Contraindications**
  - No functional electronic capnography
  - When airway rescue using CPG A0303 Difficult Airway Guideline is not possible
  - If GCS ≤ 10 patients can only be intubated after consultation

- **RSI - Standard**
  - All other indications
  - High GCS requires additional sedation
  - Action:
    - Ketamine 1.5 mg/kg IV (max. 200 mg)
    - If GCS ≥ 10: Midazolam 5 mg IV
    - Rocuronium 1 mg/kg IV (max. 100 mg)

- **RSI - Modified**
  - Ketamine contraindicated
  - Adjust dose for frail / elderly
  - Action:
    - Fentanyl 100 – 200 mcg IV
    - Midazolam 5 – 10 mg IV
    - Rocuronium 1 mg/kg IV (max. 100 mg)

- **Delayed Sequence Intubation**
  - Combative / hypoxic respiratory failure preventing pre-oxygenation
  - Ketamine via slow IV push
  - Action:
    - Ketamine 1.5 mg/kg IV (max. 200 mg)
    - Preoxygenate for 3 minutes
    - Rocuronium 1 mg/kg IV (max. 100 mg)

- **Placement**
  - Action:
    - Sight the ETT through the vocal cords* and position appropriately via Australian Standard markings
    - Note length at lips

- **Immediately confirm placement with end-tidal respiratory waveform**

- **Supplementary checks**
  - Capnometry
  - Rise and fall of chest
  - Auscultation
  - SpO₂

- **"If unable to obtain a Grade 1 or 2 view**
  - Consider "head, scope, throat"
  - Problem-solve airway view by using additional head lift plus any combination of:
    - Lip retraction
    - External laryngeal manipulation
    - Jaw support/mouth opening
  - If unable to improve airway view manage as per CPG A0303 Difficult Airway Guideline

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Guideline Principles

- This guideline applies to all patients (≥ 12 years of age) undergoing medication assisted intubation. However, the principles may also be applied to unassisted intubation.

Oxygenation

- A critical desaturation threshold should be identified by the team. For the adequately oxygenated patient this may be defined as < 90%. In difficult to oxygenate patients this will be lower, but a critical threshold should still be verbalized.
- Rescue airway strategies should be used at any time during the procedure to correct critical desaturation.

Crew Resource Management

- RSI is a team-based procedure. Team roles, anticipated challenges and airway plan must be verbalized prior to commencement.
- Difficulties encountered during the procedure must be communicated to the team to ensure a shared awareness and prompt corrective actions.

Plan A: OPTIMISED First intubation attempt

- First pass intubation is the key objective of this guideline.
- The strategy of ‘Head-Scope-Throat’ is a rapid analysis of intubation difficulties and appropriate equipment selection. ‘Head-Scope-Throat’ should be performed when difficulties are encountered and/or between first and second attempt.
- Equipment selection is based on paramedic preference and clinical context (i.e. anatomy, airway complications). However it is recommended that Plan A should include the use of a bougie.

Plan B: ALTERNATIVE second intubation attempt

- A second intubation attempt must involve an alternative strategy that corrects identified issues.
- Alternative strategies should include the bougie and/or video laryngoscope if not previously utilized.

Plan C: Rescue Airway Strategy

- If intubation is unsuccessful following two attempts, rescue airway strategies must be implemented with the key objective of achieving adequate oxygenation.
- The preferred airway rescue strategy is the SGA. However there may be clinical circumstances where reverting to two-handed BVM combined with basic airway adjuncts is appropriate.

Plan D: Can’t Intubate Cant Oxygenate

- A can’t intubate, can’t oxygenate (CICO) situation is a life-threatening emergency that requires cricothyroidotomy.
- While rare, in critical desaturation where the patient is deemed to be at immediate risk of arrest,
moving directly to Plan D may be appropriate.

- Cricothyroidotomy is a primary airway method when intubation is deemed impossible, and other airway techniques (i.e. SGA and BVM) are not possible or ineffective. Refer CPG A0304 Cricothyroidotomy

**Flowchart**

**Plan A**

**First Intubation Attempt**

**Status**

- Patient requiring intubation

**Action**

- OPTIMISED first intubation attempt

**Assess**

- Confirmation of tracheal placement by ETCO₂?

If **Yes**:

- **Action**
  - Mx as per CPG A0305 Airway maintenance

If **No**:

- **Action**
  - ALTERNATIVE second intubation attempt

**Assess**

- Confirmation of tracheal placement by ETCO₂?

If **Yes**:

- **Action**
  - Mx as per CPG A0305 Airway maintenance

If **No**:

**Plan B**

**Second Intubation Attempt**

**Plan C**

**Airway Rescue Strategy**

**VERBALISE!**

- “Unable to Intubate, moving to rescue airway strategy”

**Action**

- Insert SGA, with BVM as alternative

**Assess**

- Able to oxygenate?

If **Yes**:

- **Action**
  - Maintain SGA where practicable
  - Mx as per CPG A0305 Airway maintenance

If **No**:

**Plan D**

**Can’t Intubate, Can’t Oxygenate**

**Action**

- Cricothyroidotomy
- Mx as per CPG A0305 airway maintenance
Cricothyroidotomy

Flowchart

**Status**
- Unconscious patient unable to be oxygenated and ventilated using BVM and OPA, NPA, LMA or ETT where:
  - RSI has been attempted but intubation has not been achieved
  - RSI is not authorised
  - Massive facial trauma is present and RSI is considered unsafe due to the inability to undertake the Difficult Airway Guideline
  - RSI is not possible due to lack of IV / IO access
  - Upper airway obstruction is present due to a pharyngeal or an impacted foreign body which is unable to be removed using manual techniques and Megill’s forceps
  - Partial airway obstruction is present and transport by Air Ambulance is required and expertise for alternative techniques is not available.

**Stop**
- **Contraindications**
  - There are no C/is when oxygenation and ventilation cannot occur with other techniques
  - The use of a mechanical ventilator is contraindicated if the airway is being managed with a cricothyroidotomy (except for AAV)

**Action**
- Perform cricothyroidotomy using approved kit
- Provide post cricothyroidotomy sedation and paralysis as per CPG A0305 Airway maintenance

Cricothyroidotomy is always an option if a patient cannot be ventilated/oxygenated. Whilst other techniques to manage the airway emergency may be attempted first, if they are unsuccessful MICA Paramedics are explicitly authorised to perform this skill prior to the patient going into cardiac arrest.

Related Resources

https://av-digital-cpg.web.app/assets/pdf/CWI/CWI OPS 001 Cric with a QuickTrach II or TracheoQuick Plus [CPG A0304].pdf
Care Objectives

- Optimise sedation +/- paralysis
- Optimise ventilation parameters using lung protective strategies

General Notes

Indications

- Post intubation paralysis is indicated:
  - In all primary neurological patients
  - Where sedation alone is ineffective at maintaining intubation or allowing adequate ventilation/oxygenation
  - To prevent shivering in patients being therapeutically cooled
  - To facilitate mechanical ventilation (continuous mandatory ventilation (CMV) mode)

Status epilepticus

- Status epilepticus patients may require intubation (including paralysis) if there are airway or ventilation compromise which is not able to be managed using BVM and OPA/NPA. Paralysis is never to be used with the intent of terminating the seizure.
- This patient group may require high doses of Midazolam (bolus/independent infusion) post intubation. Rates in excess of 20 mg/hr may be necessary to ensure effective control.
- Cardiovascular support using saline administration and/or adrenaline infusion may be necessary.

Non-traumatic brain injury

- Bolus Fentanyl (25 – 50 mcgs) and Midazolam (2.5 – 5 mg) may be administered to achieve SBP < 140 mmHg post-intubation.
- Normal Saline and adrenaline may be used to achieve SBP > 120 mmHg as per CPG A0407 Inadequate perfusion (Cardiogenic).

Sedation

- Patients should be routinely given a loading dose of sedation prior to commencement of the infusion to ensure a therapeutic level is achieved rapidly.
- 1 – 15 mL/hr is a suggested range only and some patient cohorts will exceed this e.g. high pain and high GCS prior to ETT.
- Consider running independent opioid and Midazolam infusions to allow differing analgesic and sedation doses for specific presentations (e.g. pain-producing pathology/injuries, status epilepticus, etc.).
- Signs of inadequate sedation include cough, gag or patient movement, HR and BP trending up together, lacrimation, diaphoresis, and salivation.

Paralysis
All patients who are paralysed require ongoing sedation.

Rocuronium infusions should be prepared with 100 mg in a 10 mL syringe.

Where access to infusion pumps are limited, preference should be for sedation and inotrope infusion not paralysis.

**Mechanical ventilation**

- Attach mechanical ventilator where indicated and use lung protective ventilation strategies.
  - **Settings:**
    - Ventilate using 100% O\textsubscript{2}
    - V\textsubscript{T} 6 – 7 mL/kg.
    - Ventilation rate – 12
    - 5 cmH\textsubscript{2}O PEEP (in the setting of acute lung injury, if SpO\textsubscript{2} remains < 92% increase to 10 cmH\textsubscript{2}O)
  - **Maintain:**
    - SpO\textsubscript{2} > 95%
    - EtCO\textsubscript{2} at 30 - 35 mmHg
  - **EtCO\textsubscript{2} target may vary in the following patient cohorts:**
    - **Asthma** - higher EtCO\textsubscript{2} may be appropriate permitted
    - **TCA OD** - maintain EtCO\textsubscript{2} 20 - 25 mmHg
    - **DKA** - EtCO\textsubscript{2} should be maintained at the level detected immediately pre-intubation, with a maximum of 25 mmHg.

**General care**

- Insert bite block (non-paralysed patients)
- Suction ETT and oropharynx
- Gastric decompression
- Consider disconnecting ETT circuit during transfer if clinically appropriate
- Reconfirm tracheal placement following each movement
- If previously functioning electronic capnography fails (ETT placement previously confirmed), monitor tracheal placement with colorimetric device while troubleshooting
- Position patient in a 30° head-up semi-recumbent position if clinically appropriate
- Check cuff pressure and ensure 20 – 30 cmH\textsubscript{2}O
- Maintain normothermia unless otherwise indicated
- Monitor temperature using oesophageal probe where available
• Undertake the Critical IHT Checklist to ensure comprehensive patient care post intubation

Flowchart

**Status**
- Intubated
- SGA
- Surgical airway

**Stop**
- **ETT:** Tracheal placement must be continually monitored via electronic capnography and confirmed prior to administration of paralysis
- **SGA:** Ongoing sedation / paralysis is only permitted to maintain a SGA inserted as a rescue airway as per CPG A0303 Difficult Airway Guideline

**Assess**
- Level of sedation / analgesia required
- Requirement for paralysis

**Sedation**

**Action**
- **Fentanyl / Midazolam infusion 1 – 15 mL/hr IV** OR
- **Morphine / Midazolam infusion 1 – 15 mL/hr IV**

Until sedation infusion established:
- **Ketamine 20 – 40 mg IV** as required OR
- **Midazolam up to 5 mg IV** as required, AND
- **Fentanyl up to 100 mcg IV** as required

**Paralysis**

**Action**
- **Rocuronium 50 mg IV** every 15 minutes OR
- **Rocuronium infusion 50 mg/hr (5 mL/hr) IV**
Rapid identification of STEMI to facilitate timely reperfusion (PCI or PHT) is the primary goal of prehospital management.

- Provision of antiplatelet rx (aspirin).
- Reduce cardiac workload by treating associated symptoms (e.g. nausea, pain).

The spectrum of ACS encompasses unstable angina, non ST-elevation ACS (NSTEMI) and ST-elevation myocardial infarction (STEMI).

Not all patients with ACS will present with pain (e.g. elderly, female, diabetes history, atypical presentations).

The absence of ischaemic signs on the ECG does not exclude AMI. AMI is diagnosed by presenting history, serial ECGs and serial enzyme tests.

Suspected ACS-related pain that has spontaneously resolved warrants investigation in hospital.

In patients who may be eligible for thrombolysis, invasive procedures should only be conducted according to clinical need and with the potential for increased bleeding risk in mind.

Hyperoxaemia has been shown to be detrimental in patients with STEMI. Routine oxygen administration is not required in ACS and should only be provided as per CPG A0001 Oxygen Therapy.

If a lower dose of aspirin has been administered prior to AV arrival, it is reasonable for paramedics to supplement the dose to as close to 300 mg as possible.

Nitrates are C/I in bradycardia (HR < 50 bpm) due to the patient’s inability to compensate for a decrease in venous return by increasing HR to improve cardiac output. C.O. = HR x SV

Where this CPG refers to GTN S/L, buccal administration can be substituted if required.

In patients who may be eligible for thrombolysis, invasive procedures should only be conducted according to clinical need and with the potential for increased bleeding risk in mind.

Inadequate Perfusion – treat as per CPG A0407 Inadequate Perfusion

Dysrhythmias – see appropriate CPG
Flowchart

**Assess**
- Signs and symptoms
- 12-lead ECG (within 10 minutes)
- Rx already administered (e.g. aspirin, GTN)

**STOP**
- Request early MICA / aeromedical support in suspected STEMI and provide early hospital notification

**Antiplatelet Rx**
- Aspirin 300 mg oral if not already administered

**Pain Relief**
- GTN 600 mcg S/L if SBP > 110 mmHg OR
  - GTN 300 mcg S/L if no prev. admin, borderline BP or small (< 60 kg), elderly or frail Pts
  - Repeat 300 or 600 mcg S/L @ 5 minute intervals titrated to pain or side effects
- GTN patch 50 mg (0.4 mg/hr) upper torso / arms
  - Remove patch if BP falls < 90 mmHg
  - Inadequate response or Nitrates C/I
    - Treat with opioids as per CPG A0501 Pain Relief

**STEMI**
- If onset < 12 hours continue Rx as per CPG A0408 STEMI Management
- If onset > 12 hours transmit 12-lead ECG and provide hospital notification
- Notify APR via clinician where secondary transfer may be required

**Isolated Hypertension**
- SBP > 160 mmHg or DBP > 100 mmHg
  - GTN 300 mcg S/L
    - Repeat 300 mcg @ 5 minute intervals if hypertension persists

**Related Resources**
- Heart Foundation Resources for Health Professionals
- Cardiac Clinical Network (SCV)
Care Objectives

- To increase heart rate where bradycardia is causing haemodynamic compromise, heart failure or life threatening arrhythmia.

General Notes

- **Atropine** is unlikely to be effective in 2nd degree type II (Mobitz II) and 3rd degree (complete) heart block, however, it should still be administered.

- Where the patient initially responds adequately to two doses of **Atropine** however the effect is not sustained, repeat **Atropine 600 mcg** doses as required (**total maximum of 3000 mcg**).

- **Atropine** is ineffective and potentially harmful in patients who have had cardiac transplant.

- **Atropine** should be used with caution in myocardial infarction as increased heart rate may worsen ischemia.

- Titrate **Adrenaline** to patient response. If no increase in HR after **10 mcg/min**, pacing should be commenced.

- If side effects occur during **Adrenaline** infusion, cease infusion and recommence once side effects resolve or proceed to pacing.

- **Adrenaline Infusion**
  - Adrenaline 3 mg added to make 50 mL with D5W or Normal Saline
  - 1 mL/hr = 1 mcg/min

Stable bradycardia

- Bradycardia is defined as a heart rate less than 60 beats per minute. In practical terms, many patients will have a normal heart rate between 50 and 60 beats per minute. Consider 50 bpm as a threshold for management. Asymptomatic patients with adequate perfusion and a HR of > 20 may require monitoring and transport but not management.
Flowchart

**Assess / Consider**
- Perfusion status
- Cardiac rhythm
- Heart failure
- Ischaemic chest pain

**Unstable**
- Less than adequate perfusion (including acute STEMI and ischaemic chest pain)
- Prolonged bradycardia (HR < 40 bpm) and APO
- Runs of VT or ventricular escape rhythms
- HR < 20 bpm

**Action**
- Atropine 600 mcg IV
- Repeat 1200 mcg after 3 – 5 minutes if inadequate response

**Inadequate response**
- Inadequate or extremely poor perfusion persists after Atropine 1800 mcg IV

**Action**
- Adrenaline infusion 5 mcg/minute
- Increase to 10 mcg/minute if required

**Extremely poor perfusion persists**

**Action**
- Transcutaneous pacing
  - Midazolam 1 – 2 mg IV and Fentanyl 50 mcg IV as required
  - Commence pacing at 30mA and a heart rate of 70/min.
  - Increase by 10mA until capture of QRS on ECG
  - Set at 10mA above capture voltage

**Adequate response**

**Action**
- Continue Atropine 600 mcg IV at 3 – 5 minute intervals as required (max. 3000 mcg)
- Mix as per inadequate response if patient deteriorates
Care Objectives

- Rapid termination of life threatening arrhythmias and transport to a facility capable of definitive care.
- Rapid transport to facilitate the treatment of the arrhythmia where treatment is not available in the prehospital environment.
- Early termination of stable SVT where possible, following ECG capture.
Adenosine should be administered rapidly through a large vein proximal to the heart such as in the cubital fossa and followed with a Normal Saline bolus flush.

AF and SVT deteriorating to the point of cardiac arrest should be treated initially with synchronised cardioversion 200J.

The effectiveness of the patient’s respirations should be continuously monitored after sedation.

Signs and symptoms of an unstable and rapidly deteriorating patient may include:
- Inadequate perfusion / shock (e.g. hypotension, pallor and diaphoresis)
- Acutely altered conscious state or loss of consciousness
- Ischaemic chest pain
- APO

These signs and symptoms are usually associated with significant tachycardia (≥ 150 bpm) unless there is impaired cardiac function.

**Modified Valsalva**

1. Position laying semi-recumbent (45° angle).
2. Forced expiration.
3. Immediately lay the patient flat and raise their legs to a 45° angle for 15 seconds.
4. Return the patient to the semi-recumbent position.

**Standard Valsalva**

1. Position patient supine.
2. Forced expiration.

Evidence suggests the modified Valsalva achieves superior reversion rates in comparison to other techniques. However, the environment, patient size and available resources may influence the choice of manoeuvre.

Paramedics should perform a standard Valsalva where they believe the modified Valsalva presents a manual handling risk or is not possible due to environmental concerns.

Forced expiration at the target pressure of approximately 40 mmHg can be achieved by blowing for 15 seconds into a 10 mL syringe hard enough to move the plunger.

The Valsalva manoeuvre is reserved exclusively for patients with a SBP of ≥ 90 mmHg.

A 12 lead ECG should be recorded prior to Mx unless the patient requires immediate treatment.
Care Objectives

- Rapid termination of life threatening arrhythmias and transport to a facility capable of definitive care.
- Rapid transport to facilitate the treatment of the arrhythmia where treatment is not available in the prehospital environment.

General Notes

- Ventricular Tachycardia requiring management is defined as:
  - Lasting > 30 seconds
  - Rate > 100
  - QRS > 0.12 seconds
  - Regular (mostly)
  - AV dissociation or absence of P waves

- Where rhythm interpretation is uncertain, a regular broad complex tachycardia should be treated as VT until proven otherwise.

- Signs and symptoms of an unstable and rapidly deteriorating patient may include:
  - Inadequate perfusion / shock (e.g. hypotension, pallor and diaphoresis)
  - Acutely altered conscious state or loss of consciousness
  - Ischaemic chest pain
  - APO

- These signs and symptoms are usually associated with significant tachycardia (≥ 150 bpm) unless there is impaired cardiac function.

- ALS crews should consider the time to get MICA support versus the time to hospital, as these patients are dynamic and have the potential to deteriorate.

- The effectiveness of the patient’s respirations should be continuously monitored after sedation.
Flowchart

**Status**
- QRS > 0.12 sec

**Stop**
- If patient loses C.O. at any stage Mx as per CPG A0201 Cardiac Arrest

**Stable: VT or unclear**

✔️ **Action**
- Only dilute Amiodarone with D5W
- Do not administer Amiodarone if suspected TCA OD. Mx as per CPG A0707 Overdose: TCA
- Do not administer Amiodarone if VT follows Ondansetron administration
- Amiodarone infusion 5mg/kg IV (max. 300 mg) over 20 minutes once only
- Rx as per Unstable and rapidly deteriorating if patient deteriorates

**Unstable and rapidly deteriorating**

✔️ **Action**
- Synchronised cardioversion
  - Midazolam 1-2 mg IV and Fentanyl 50 mcg IV as required.
  - Cardioversion: DCCS 150 J.
  - Repeat once if required
  - If unsuccessful change pads to anterior-posterior vector and DCCS 200 J.

**No reversion OR reversion to narrow complex rhythm**

✔️ **Action**
- Amiodarone infusion per Stable (if not already established)
- Other rhythms (eg: slow wide complex)
  - Rx as per appropriate CPG
Nitrates treat the underlying cause of cardiogenic APO and should be administered to all patients presenting in symptomatic cardiogenic APO unless contraindicated.

CPAP is an appropriate treatment for respiratory failure associated with APO while the underlying cause is addressed. It may be required in patients unresponsive to nitrates or where respiratory failure is significant enough to require immediate treatment concurrent with nitrates.

**Furosemide** is not an appropriate first line treatment in hypertensive patients with a sympathetically driven APO. Nitrates and CPAP (where required) should be the initial priority. Where the patient is normotensive, or hypertension has been corrected with nitrates, **Furosemide** may be considered.

**Care Objectives**

- **Cardiogenic APO**: This CPG is primarily directed at symptomatic cardiogenic pulmonary oedema, secondary to LVF or CCF. Other medical causes of pulmonary oedema should not be treated under this CPG. Asymptomatic APO does not require treatment.

- **Non-cardiac APO**: causes include smoke/toxic gas inhalation, near drowning (aspiration) and anaphylaxis. In these cases the pulmonary oedema is likely a result of altered permeability and should be treated with supplemental oxygen and assisted ventilation where indicated. They do not require nitrates.

- **Mx chest pain as per** CPG **A0401 Acute Coronary Syndrome**.

- **Furosemide** should be used cautiously in the hypotensive patient.

- Patients with pulmonary oedema presenting with a wheeze should only be managed as per CPG **A0601 Asthma** if a past history of bronchospasm can be confirmed.

- Avoid the use of **Salbutamol** in the setting of pulmonary oedema where possible.

- **Contraindications to CPAP**:
  - GCS < 13
  - Facial trauma
  - Pneumothorax
  - Active vomiting
  - Life threatening arrhythmias
  - The need for a secure airway
  - Hypoventilation
Flowchart

**Status**
- Symptomatic cardiogenic pulmonary oedema

**Short of breath and crackles**

**Action**
- GTN 600 mcg S/L if SBP > 110 mmHg
- OR
- GTN 300 mcg S/L if no prev. admin, borderline BP or small (< 60 kg), elderly or frail Pts
- Repeat **300 or 600 mcg S/L @ 5 minute intervals** titrated to pain or side effects
- GTN patch 50 mg (0.4 mg/hr) upper torso / arms
  - Remove patch if BP falls < 90 mmHg

**No improvement OR full field APO**

**Action**
- CPAP
- Suction and assisted ventilation if required
- Consider intubation as per CPG A0302 Endotracheal Intubation and ensure adequate PEEP.

**Assess / Consider**
- Normotensive or hypertension resolved

**Action**
- Consider Furosemide 20 – 40 mg IV or patient’s daily dose IV as a single dose (max. 100 mg)
Inadequate Perfusion (Cardiogenic)  

Care Objectives

- To achieve a perfusion target appropriate to the patient’s condition.

General Notes

- Any IV infusions established under this CPG must be clearly labelled with the name and dose of any additive medications and their dilution.
- A patient presenting with inadequate to extremely poor perfusion resulting from a cardiac event may not always have associated chest pain, e.g. silent MI, cardiomyopathy.
- Patients presenting with suspected PE with inadequate to extremely poor perfusion should be managed with this CPG. PE is not specifically a cardiac problem but may lead to cardiogenic shock due to an obstruction to venous return and the patient may require fluid and Adrenaline therapy.
- **Adrenaline infusion > 50 mcg/min** may be required to manage these patients. Ensure delivery system is fully operational (e.g. tube not kinked, IV patent) prior to increasing dose.
- Unstable patients may require bolus **Adrenaline** concurrently with the infusion.
- **Adrenaline infusion**
  - **Adrenaline 3 mg** added to make **50 mL** with **D5W** or **Normal Saline**.
  - **1 mL/hr = 1 mcg/min**

  **Adrenaline infusion > 100 mcg/min** is likely to be harmful to the patient. Paramedics should consider further fluid therapy or accept a lower blood pressure in this setting as it may reflect a better balance between perfusion and the side effects of adrenaline.
Flowchart

**Status**
- Inadequate perfusion: cardiogenic causes

**Stop**
- Mx other causes, e.g. arrhythmia, pain, hypovolaemia

**Assess**
- Signs of pulmonary oedema (crackles)

**Crackles**

**Action**
- **Adrenaline infusion** as per Inadequate or extremely poor perfusion

**No crackles**

**Action**
- **Normal Saline 250 mL IV**
  - Repeat **250 mL IV** if chest clear and inadequate or extremely poor perfusion persists

**Inadequate or extremely poor perfusion persists**

**Action**
- **Adrenaline infusion** (3 mg/50mL D5W / Normal Saline) commencing 5 mcg/min (5 mL/hr)
  - Titrate to achieve systolic BP 100 mmHg (max 250 mcg/min).
  - Reassess patient and delivery system prior to increasing rate beyond 50 mcg/min

- If syringe pump unavailable
  - **Adrenaline 10mcg IV** as required
  - If poor response, **Adrenaline 50 - 100 mcg IV** as required

- If chest clear continue **Normal Saline 250 mL IV** boluses up to 20 mL/kg
Care Objectives

- In the setting of STEMI, time from onset of symptoms to coronary reperfusion correlates to the amount of permanent myocardial damage and risk of death. Once STEMI is identified, all efforts should aim to expedite coronary reperfusion whether via PCI or PHT. The primary destination is intended to be a PCI centre in all cases.

General Notes

- The time to PCI facility is measured from the time at which the 12-lead ECG changes consistent with a STEMI are identified by a PHT endorsed and equipped paramedic.

- If a 12-lead ECG identifies a potential STEMI and the patient is eligible for thrombolysis, but the paramedic believes the monitor’s interpretation of the ECG is incorrect, the cardiology consult service must be contacted.

Patient Destination

- Following pre-hospital thrombolysis, aim to transport the patient to the closest PCI facility (in consultation with the Clinician).

- In instances where distance or resourcing precludes travel to a PCI centre as the primary destination, consider the following in consultation with the Clinician:
  - Utilising AAV as a primary transfer option;
  - Transporting the patient to an “interim health care facility (from where secondary transfer to a PCI facility will be co-ordinated between the Clinician and ARV).

  *An appropriate interim destination is a facility with a registered emergency department that can provide temporary care for the thrombolysed patient whilst awaiting ARV retrieval to a PCI facility.

- Contact the cardiology consult service for IO administration of thrombolysis in cases where IV access cannot be achieved.
**Flowchart**

- **STEMI** identified or monitor identifies acute intact.
  - **Action**
    - Transmit ECG
    - Request MICA (ALS)
    - Treat as per STEMI Management CPG A0401 Acute coronary syndromes

- **Symptoms > 12 hours**
  - **Action**
    - Continue Mx as per STEMI Management CPG A0401 Acute coronary syndromes
    - Transport with notification

- **Time to PCI**
  - Inclusion criteria
  - Exclusion criteria
  - Relative contraindications

- **Prehospital thrombolysis**
  - **Action**
    - IV access x 2, Normal Saline TKVO
    - Complete checklist and read information statement to Pt
    - Tenecteplase IV bolus (see Table 1)
    - Heparin IV bolus 4000 IU
      - Repeat Heparin IV bolus 1000 IU at 1 hour intervals
      - Capture a repeat ECG 30 minutes prior to arrival and transmit to receiving hospital with notification

- **Stop**
  - ALS paramedics MUST call the cardiology consult service prior to progressing to thrombolysis in all cases
  - MICA paramedics must call the cardiology consult service where any relative CI are present

- **Urgent transport to PCI facility**
  - **Time to PCI < 1 hour (PHT endorsed and equipped paramedic) OR**
  - **Does not meet all inclusion criteria OR**
  - **Meets one or more exclusion criteria**

- **Stop**
  - Paramedics should call the cardiology consult service if there is any uncertainty regarding diagnosis of STEMI or thrombolysis
  - ALS paramedics MUST call the cardiology consult service prior to administering Heparin
  - Do not delay transport

- **Action**
  - Continue Mx as per STEMI Management CPG A0401 Acute coronary syndrome
  - Transport with hospital notification
  - Heparin IV bolus 4000 IU
    - Repeat Heparin IV bolus 1000 IU at 1 hour intervals
    - Capture a repeat ECG 30 minutes prior to arrival and transmit to receiving hospital with notification

---

**Tenecteplase Dose Table**

<table>
<thead>
<tr>
<th>Pt weight</th>
<th>mg</th>
<th>IU</th>
<th>mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60 kg</td>
<td>30</td>
<td>6,000</td>
<td>6</td>
</tr>
<tr>
<td>60 - 69 kg</td>
<td>35</td>
<td>7,000</td>
<td>7</td>
</tr>
<tr>
<td>70 - 79 kg</td>
<td>40</td>
<td>8,000</td>
<td>8</td>
</tr>
<tr>
<td>80 - 89 kg</td>
<td>45</td>
<td>9,000</td>
<td>9</td>
</tr>
<tr>
<td>≥ 90 kg</td>
<td>50</td>
<td>10,000</td>
<td>10</td>
</tr>
</tbody>
</table>

**Tenecteplase Dose (IV)**

Following consultation for Pts ≥ 75 years, the Tenecteplase dose MUST be halved
# Checklist

## Thrombolysis exclusion criteria

The patient **CANNOT** be thrombolysed if they meet **ANY** of the following criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has the patient had major surgery in the past 3 months?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Major surgery is defined as involving a body part where bleeding may prove life-threatening if it develops e.g. intracranial, chest, abdomen, spine or joint replacement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the patient had a significant head injury in the past 3 months?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Significant head injury is an injury that was severe enough to result in an injury visible on CT scan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the patient had major trauma in the past 3 months?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Major trauma is defined as severe enough to cause an injury where bleeding may prove life-threatening if it develops e.g. multiple rib fractures, intra-abdominal injury or pelvic fractures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the patient had a stroke/TIA in the past 3 months, or ICH at any time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has the patient had a GI or genitourinary bleed in the past month?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have a current bleeding disorder, active bleeding (excluding menae) or have bleeding tendencies?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the patient currently taking anticoagulants (incl. warfarin, heparin, enoxaparin, dabigatran, rivaroxaban, apixaban) or glycoprotein fibrilla inhibitors (e.g. abciximab, eptifibatide, tirofiban)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have an allergy to Tenecteplase or gentamicin?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the patient answered “yes” to **ANY** exclusion criteria, **do not proceed with thrombolysis.**
Checklist

**Thrombolysis inclusion criteria**

The patient can **ONLY** be given thrombolysis if **BOTH** of the following inclusion criteria apply:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the symptoms start <strong>less than 12 hours ago</strong>?</td>
<td></td>
</tr>
</tbody>
</table>
| Does the monitor ECG interpretation indicate STEMI or 12-lead ECG shows ST elevation in two or more contiguous leads:  
  • ≥ 2.5 mm ST elevation in leads V2-3 in men aged <40 years, or  
  • ≥ 2 mm ST elevation in leads V2-3 in men aged ≥40 years, or  
  • ≥ 1.5 mm ST elevation in V2-3 in women, or  
  • > 1 mm in other leads, or  
  • New onset left bundle-branch block? | |

If the patient answered "no" to **ANY** inclusion criteria, **do not proceed with thrombolysis**.

**Relative contraindications**

If **ANY** of the following apply, **call the cardiology consult service** before proceeding with thrombolysis:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the patient aged ≥ 75 years?</td>
<td>Does the patient have anaemia?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have a non-compressible vascular puncture (e.g. recent organ biopsy or IV central line)?</td>
<td>Does the patient possibly have acute pericarditis or subacute bacterial endocarditis?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have a history of liver disease?</td>
<td>Has the patient received traumatic or prolonged (&gt;10 minutes) CPR?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the SBP &gt; 160 mmHg, or DBP &gt;110 mmHg?</td>
<td>Is the patient pregnant or within 1 week post-partum?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the patient of low body weight?</td>
<td>Is the HR &gt; 120 bpm?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the patient have an active peptic ulcer?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Following consultation for patients ≥ 75 years, the Tenecteplase dose MUST be halved.  
If the answer is yes to **ANY** relative contraindications, **call the cardiology consult service prior to proceeding to thrombolysis**.
Patients with STEMI are at risk of developing serious complications including bradycardia, tachycardia, poor perfusion, and/or pump failure leading to cardiogenic shock. Therefore, maintain constant cardiac monitoring until arrival at destination and be alert for potential cardiac arrest. Monitor the patient for signs of myocardial reperfusion (such as ectopic beats, self-limiting runs of VT, resolving ST segments, or a return to sinus rhythm).

Record routine 12-lead ECGs at 15 minute intervals looking for signs of ST segment resolution. Note the time, number in series, and pain score. (Additional 12-lead ECGs should be recorded as required.)

Success or failure of thrombolysis cannot be known for certain until the vessel is viewed during the PCI procedure. However, a reduction in pain, and of the ST segment by half (or more) of the initial elevation is a positive sign. This could take up to 60 - 90 minutes to occur. Thrombolysis is known to be unsuccessful in approximately 30% of cases.

Closely monitor obvious and obscure sites for potential bleeding e.g. cannulation sites, PR, GI, and mucous membranes (oral and conjunctival).

STEMI patients who have failed thrombolysis, or who suffer complications should be managed symptomatically as per the relevant CPGs.

Continue to manage the patient's:
- Pain as per CPG A0401 Acute Coronary Syndrome and CPG A0501 Pain Relief; and
- Nausea and vomiting as per CPG A0701 Nausea and Vomiting.
Flowchart

**Status**
- Thrombolysed Pt

**Assess**
- Perfusion status
- Cardiac rhythm
- Conscious state
- Potential bleeding sites

**Inadequate perfusion**
- Avoid hypotension, target SBP > 100 mmHg
  
  **Action**
  - See CPG A0407 Inadequate Perfusion Cardiogenic Causes

**Arrhythmia Mx**
- Reperfusion arrhythmias are common and to be expected post thrombolysis.
- Anti-arrhythmic agents are indicated only if the arrhythmia persists for > 2/50 and/or perfusion is compromised.
  
  **Action**
  - See:
    - CPG A0402 Bradycardia
    - CPG A0403 Tachycardia (narrow complex)
    - CPG A0404 Tachycardia (wide complex)
    - If cardiac arrest, Rx immediately as per CPG A0201 Cardiac Arrest - Medical
Patients need to be aware of the potential side-effects of thrombolysis prior to administration. The following statement outlines important key messages and should be read to the patient prior to thrombolysis:

"Your ECG (heart tracing) shows that you are having a heart attack. The best treatment for you right now is a clot dissolving drug called Tenecteplase, and the sooner you receive this medication, the lower your risk of long-term, severe heart muscle damage.

Before I give you this medication, I want to let you know of the potential risks:

The most serious risk of receiving this medication is stroke which affects about 1 in 100 patients. Other risks include bleeding which is not life-threatening and occurs in approximately 4 in 100 patients treated. Some patients can have an allergic reaction or other effects that are generally not cause for concern. We can manage these bleeding and allergy risks if they occur on the way to hospital.

The risks I have just listed will be the same if we delay, and you then go on to receive this treatment in hospital. The longer this treatment is delayed the worse the damage to your heart muscle will be."
Care Objectives

- To reduce the suffering associated with the experience of pain to a degree that the patient is comfortable.

General Notes

Quality Analgesia

- The adequacy of analgesia should be discussed with the patient and balanced against medication side effects. The patient reporting comfort is the most important indicator of adequate analgesia. Distressed appearance, physiological signs of pain and verbal numerical rating may contribute to determining the adequacy of analgesia.

- An inability to report or rate pain (e.g. dementia, intellectual disability, non-English speaking) should not preclude analgesia. Where discomfort is evident in the setting of possible pain producing stimuli, strongly consider options for analgesia.

- Consider administering paracetamol in addition to opioids for moderate pain where the oral route is not contraindicated (e.g. possible emergency surgery or procedural sedation).

- Methoxyflurane and/or IN fentanyl may be used prior to IV therapy where the patient has severe pain and there is a delay to IV access. The preferred choice for non IV therapy in moderate to severe pain is fentanyl IN.

- Opioids/ketamine should be titrated to pain or side effects. If significant respiratory depression occurs due to opioid administration, manage as per CPG A0707 Overdose – other opioid overdose.

- Consider further dose reductions or longer dose intervals in very small or frail patients.

- ALS Paramedics are encouraged to consult for further doses of opioids where the maximum doses of morphine or fentanyl have been reached but the patient remains in pain. In cases of extreme traumatic pain where MICA is not available, ALS paramedics should consult for IV ketamine.

IV Fentanyl

- Studies have found no significant difference between the efficacy of morphine and fentanyl. The pharmacological and pharmacokinetic properties of fentanyl are preferred for the following indications:
  - Contraindication to morphine (see above)
  - Short duration of action desirable (e.g. dislocations)
  - Hypotension
  - Nausea and / or vomiting
  - Severe headache (refer to CPG A0502 Headache)

Ketamine

- Hypersalivation is a known side effect of ketamine. On most occasions suctioning will be sufficient. Where hypersalivation becomes difficult to manage or the airway is compromised, treatment may include administration of Atropine 600mcg IV/IM (MICA only)

- Emergence reactions, hallucinations or other behavioural disturbance associated with ketamine
administration may be managed with **Midazolam 0.5 - 1 mg IV** (ALS – consult only).

**Procedural pain**

- Procedural pain refers to any situation in which a patient requires supplemental analgesia for short periods of time:
  - Moderate procedural pain may include splinting minor fractures, reducing dislocations, transferring patients to or from the stretcher or difficult egress (e.g. rough terrain).
  - Severe procedural pain refers to the extrication or manipulation of patients with severe musculoskeletal injury.

**Flowchart**

- **Mild pain**
  - Action: If Pt requests analgesia consider:
    - **Paracetamol 1000 mg oral** if not already administered within past 4 hours
    - **Paracetamol 500 mg oral** (weight < 60 kg or frail or elderly, malnourished or liver disease)
  - If pain not controlled or rapid pain relief required, consider treating as per Moderate pain
  - Paracetamol should not be used to treat acute pain in suspected acute coronary syndrome

- **Moderate pain**
  - Action:
    - **Morphine up to 5 mg IV** (consider contraindications)
      - Repeat up to 5mg at 5 minute intervals
          (consult after 20 mg IV)
      - **Fentanyl up to 50 mcg IV** (if specifically indicated)
        - Repeat up to Fentanyl 50 mcg IV at 5 minute intervals
          (consult after 200 mcg IV)
    - IV access not required, delayed or unsuccessful:
      - **Fentanyl 100 mcg IN** (weight < 60 kg or frail or elderly)
      - Repeat up to Fentanyl 50 mcg IN at 5 minute intervals (max. 200 mcg IN)
      - **Fentanyl 200 mcg IN**
        - Repeat up to Fentanyl 50 mcg IN at 5 minute intervals (max. 400 mcg IN)

- **Severe pain**
  - Action:
    - **Morphine 10 mg IM**
      - Repeat Morphine 5 mg IM after 15 minutes
          if required (once only)
    - **Continue Morphine IV or Fentanyl IV** as above – no max. dose
    - External traumatic pain persists despite opioid therapy:
      - **Consider Ketamine 10 - 20 mg IV at 5 - 10 minute intervals**
      - For severe procedural pain consider **Ketamine 20 - 30 mg IV at 2 minute intervals** until patient is dissociated or analgesia is adequate
      - For uncontrolled extreme pain, consider **ETT as per CPG A0302 Endotracheal Intubation**
Patients who suffer from chronic pain conditions are not likely to seek emergency help unless their usual pain management plan has failed and they are unable to cope with their current level of pain.

Common aetiologies of chronic pain include low back pain, headache / migraine, joint pain, and neuropathic pain (e.g. Parkinson's disease, Multiple Sclerosis, poststroke pain).

Chronic pain can be difficult to assess (may not present with usual signs of pain such as tachycardia and agitation) and complex to manage as the response to pain management may vary significantly between patients.

Patients with chronic pain may be on a pain management plan that includes a balance between drug therapy, cognitive therapy, and behavioural interventions. Breakthrough pain is common, even in patients with controlled chronic pain under a care plan.

Please consider the following principles when attending patients who present with severe pain and a history of chronic pain:

- The presentation may not be related to the chronic painful condition. A search for the cause of the pain should include the standard clinical approach and assessment techniques to exclude a new aetiology.
- If the patient has a chronic pain management plan, ensure they have followed this plan.
- If possible, consult with their regular health care provider.
- Appropriate analgesic therapy within the AV setting is challenging, and it may be that reassurance and organising a medical review are the best options.
- Unless there is definitive evidence of addiction, chronic pain patients should not be assumed to be “drug seekers”.
- Partial relief is a more realistic goal than complete relief of pain.
- The patient in severe breakthrough pain is likely to require medical attention.
Paramedics do not diagnose headache. Headache management is dependent upon an in-hospital diagnosis and tailored accordingly. Pre-hospital management seeks to provide interim relief until diagnosis and more appropriate management can be provided.

Paramedics are not to administer Aspirin for headache.

Opioids are of limited benefit in the treatment of migraine. Morphine may not be effective and may be associated with delayed recovery. Fentanyl should only be used to treat severe headache where other measures have failed and where transport to the treating facility is prolonged.

Paracetamol and Prochlorperazine are indicated for severe headache considered or previously diagnosed to be migraine, irrespective of nausea and vomiting. If the patient's condition remains unchanged and transport time is prolonged, treat as per Severe Headache algorithm.

Prochlorperazine is unlikely to offer any clinical benefit for intracranial haemorrhage or SAH. It may be omitted in this case. Many patients will have signs of CNS depression in which case Prochlorperazine should not be administered.

General Care

Many patients who suffer migraines may already have a pre-set treatment plan in place. Most patients will seek emergency care when such treatment has failed or presentation of headache is different to usual headache (frequency, severity, clinical features).

Sudden onset severe headache, sometimes referred to as “thunderclap” or “worst in life”, should prompt the Paramedic to suspect serious intracranial pathology. Particular attention should be given to patients whose headache intensity increases within seconds to minutes of onset. Other warning signs that may be suggestive of serious intracranial event include:

- abnormal neurological findings or atypical aura
- new onset headache in older patients (age > 50 years) or those with a history of Cancer
- altered, level of consciousness or collapse
- seizure activity
- fever and / or neck stiffness

The management of severe dehydration (as per CPG A0701 Nausea and Vomiting) where indicated may be of assistance in the management of severe headache.

Patients suffering from previously diagnosed cluster headaches may not gain benefit from analgesia. High flow oxygen may be beneficial if the patient can confirm their diagnosis.
Flowchart

**Status**
- Headache Severity
  - Mild
  - Moderate
  - Severe

**Assess**
- Suspected intracranial haemorrhage
- Potential meningococcal septicaemia

**Stop**
- If uncertain, treat suspected Intracranial Haemorrhage as per CPG A0711 Suspected Stroke or TIA
- Treat seizures as per CPG A0703 Seizures
- If suspected Meningococcal infection treat as per CPG A0706 Meningococcal Septicaemia
- If patient presenting with severe headache and suspected Intracranial Haemorrhage, treat pain as per Severe Headache below

**Headache any severity**
- **Stop** - Prochlorperazine is not indicated for suspected Intracranial Haemorrhage or SAH
  - Paracetamol 1000 mg oral if not already administered within past 4 hours
  - OR
  - Paracetamol 500 mg oral (weight < 60 kg or frail or elderly, malnourished or liver disease)
    - WITH OR WITHOUT
  - Prochlorperazine 12.5 mg IM (if patient age ≥ 21 years)
  - If after 15 minutes of above therapy and patient headache remains severe and hospital remains > 15 minutes, treat as per Severe Headache below

**Severe headache**
- IV or IN (if no IV access) Fentanyl as per CPG A0501 Pain relief
- Aim is to reduce pain to < 7
Asthmatic patients are dynamic and can show initial improvement with treatment then deteriorate rapidly.

Consider MICA support but do not delay transport waiting for backup.

Despite hypoxaemia being a late sign of deterioration, pulse oximetry should be used throughout patient contact (if available).

An improvement in SpO₂ may not be a sign of improvement in clinical condition.

Beware of patient presenting with wheeze associated with heart failure and no asthma / COPD history.

**Adrenaline infusion**

- **Adrenaline 3 mg** added to make 50 mL with D5W or Normal Saline
- 1 mcg/min = 1 mL/hour
- Dose: 2 - 15 mcg/minute

A pMDI is the preferred route of administration for Salbutamol in patients with mild or moderate respiratory distress. If a pMDI is not available, nebulise Salbutamol 5 mg at 20 minute intervals as required.
Flowchart

**Status**
- Respiratory distress

**Assess**
- Severity of distress
- If Pt’s asthma Mx plan has been activated

**Mild or moderate**
**Action**
- **Salbutamol pMDI and spacer**
  - Deliver 4 - 12 doses at 20 minute intervals until resolution of symptoms
  - Pt to take 4 breaths for each dose

**Severe**
**Action**
- **Salbutamol 10 mg (5 mL) and Ipratropium Bromide 500 mcg (2 mL) Nebulised**
- Repeat Salbutamol 5 mg (2.5 mL) Nebulised at 5 minute intervals if required
- Dexamethasone 8 mg IV / Oral

**No Significant Response after 20 minutes**
**Action**
- Rx as per Severe

**Adequate Response**
**Action**
- Tx with continued reassessment

**Inadequate response**
**Action**
- No response to nebulised therapy
- Speaking single words or acute life threat

If unaccredited in IV Adrenaline infusion therapy:
- **Adrenaline 500 mcg IM (1 : 1,000)**
  - Repeat 500 mcg IM at 5 - 10 minute intervals (max. 1.5 mg)
- If no response to IM Adrenaline, consult the Clinician for IV Adrenaline if thunderstorm asthma 20 mcg at 2 minute intervals.

If no response to IM Adrenaline or Pt has inadequate ventilation:
- **Adrenaline 50 - 100 mcg IV at 2 - 5 minute intervals** if infusion not avail or whilst infusion being prepared
- **Adrenaline Infusion IV 2 - 15 mcg/min (2 - 15 mL/hr)**

Related Resources

- [National Asthma Handbook](#)
High EtCO\textsubscript{2} levels should be anticipated in the intubated asthmatic patient and are considered safe.

Despite EtCO\textsubscript{2} levels, treatment should not be adjusted and managing ventilation should be conscious of the effect of gas trapping when attempting to reduce EtCO\textsubscript{2}.

Due to high intrathoracic pressure as a result of gas trapping, venous return is compromised and the patient may lose cardiac output. Apnoea allows the gas trapping to decrease.
General Notes

- TPT is very unlikely in the spontaneously ventilating patient or patients receiving IPPV via BVM.
- TPT may occur as a result of forceful IPPV via ETT.
- If there are clear signs of unilateral TPT then decompression of the affected side is indicated.
- Exclusion of bilateral TPT by chest decompression should only be considered if all the following criteria are present:
  1. IPPV via ETT
  2. Sudden loss of cardiac output
  3. Rhythm = PEA
  4. Nil response to 1 minute of apnoea + IV Adrenaline

Flowchart
COPD should be suspected in any Patient over 40 years old who has:

- smoking history (or ex-smoker)
- dyspnoea that is progressive, persistent and worse with exercise
- chronic cough
- chronic sputum production
- family history of COPD.

Exacerbation of pre-existing COPD can be defined as the following:

- increased dyspnoea
- increased cough
- increased sputum production
- complete removal of wheeze in these patients may not be possible due to chronic airway disease.

**Indications for CPAP**

- SpO\(_2\) of < 90% on room air (or < 95% on supplemental O\(_2\)).

**Indications for the removal of prehospital CPAP**

- **Ineffective**
  - cardiac / respiratory arrest
  - mask intolerance / patient agitation
  - nil improvement after 1 hour of treatment

- **Vital Signs**
  - HR < 50 or SBP < 90 mmHg
  - loss of consciousness or GCS < 13
  - decreasing SpO\(_2\)

- **Active risk to Patient**
  - loss of airway control
  - copious secretions
  - active vomiting
  - paramedic judgement of clinical deterioration
Flowchart

Status
- Exacerbation of COPD

All exacerbation of COPD
✔️ Action
- Irrespective of severity
  - Salbutamol 10 mg + Ipratropium Bromide 500 mcg Nebulised
  - Dexamethasone 8 mg IV / Oral

Adequate response
✔️ Action
- Titrate O₂ flow to target SpO₂ 88 – 92%
- Consider low flow O₂ e.g. nasal prongs

Inadequate response after 10 minutes
✔️ Action
- If continuing severe respiratory distress and RR > 24:
  - CPAP (commence with 7.5 cm H₂O)
  - Increase CPAP to 10 cm H₂O at 5 – 10 minutes if no improvement in Pt condition
  - Reassess for signs of deteriorating respiratory status or ventilation failure

Patient deteriorates
✔️ Action
- Provide assisted ventilation with 100% O₂ if inadequate Vₐ or RR
- Consider ETT as per CPG A0302 Endotracheal Intubation

Related Resources

**Care Objectives**

- To identify and treat with the appropriate degree of urgency the potential airway obstruction indicated by stridor in adults.

**General Notes**

**The adult stridor patient**

- Stridor in adult patients indicates an airway obstruction of at least 50% of the internal diameter of the upper airway and should be considered an emergency.
- It is rare and can be mistaken for asthma. Bronchodilators will not assist the patient with stridor.
- When auscultating for breath sounds a stridor will be louder in the upper lung fields and loudest if the trachea is auscultated.

**History**

- Acute onset is most commonly of infectious origin (e.g. epiglottitis, Ludwig’s Angina), a foreign body or an allergic reaction.
- Chronic causes include congenital or acquired structural abnormalities, including tumours.
- If a patient has a medical history of stridor, they may have an action plan. This should be followed where possible.
- If the stridor is a result of potential airway burns, treat the patient as per CPG A0805 Burns.

**Management**

- The degree of respiratory distress that the patient is in will dictate the urgency of the situation and the need for intervention. A patient with acute onset stridor is more likely to require intervention than chronic onset.
- Intubating a patient with stridor is likely to be difficult and should prompt immediate consideration of CPG A0303 Difficult Airway Guideline, bearing in mind that the supraglottic techniques in that guideline are unlikely to be effective.

**Inter-hospital transfer**

- If paramedics are called to do an inter-hospital transfer of an adult patient with stridor who is not intubated, Adult Retrieval Victoria must be notified and a plan to best manage the patient’s airway en route formulated.
Flowchart

**Status**
- Adult patient with **audible stridor**

**Stop**
- The patient is at imminent risk of having a life-threatening airway obstruction. MICA **MUST** be requested.
- This guideline is not for treating stridor associated with anaphylaxis. See CPG A0704 Anaphylaxis for management options.

**Assess**
- Acute or chronic onset
- Respiratory status including SpO₂

**Suspected foreign body obstruction**

- **Conscious**
  - Encourage patient to cough if able
  - 5 back blows
  - 5 chest thrusts
  - Alternate the above and monitor the patient for deterioration

- **Unconscious**
  - Laryngoscope and Magill’s forceps
  - If unable to remove the obstruction, commence chest compressions
  - If patient loses cardiac output, treat as per CPG A0201 Cardiac Arrest including forced ventilations

**All other stridor**

- **Action**
  - **Adrenaline 5 mg nebulised**
    - Consult with Clinician for repeat dose if required.
    - Notify receiving hospital
  - **Dexamethasone 8 mg IV / IM**
  - If patient is in severe respiratory distress, intubate as per CPG A0302 Endotracheal Intubation whilst being fully prepared to progress to cricothyroidotomy as per CPG A0304 Cricothyroidotomy
Clinical signs of significant dehydration include:
- postural perfusion changes including tachycardia, hypotension or dizziness
- decreased sweating and urination
- poor skin turgor, dry mouth, dry tongue
- fatigue and altered consciousness
- evidence of poor fluid intake compared to fluid loss.

Undifferentiated nausea and vomiting may include but is not limited to:
- secondary to cardiac chest pain
- secondary to opioid analgesia
- secondary to cytotoxic drugs or radiotherapy
- severe gastroenteritis

If nausea and vomiting is being tolerated, basic care and transport is the only required treatment.

IV fluids may be effective in reducing nausea and/or vomiting, irrespective of anti-emetic medication. Unless clinically contraindicated (e.g. Hx of cardiac or renal failure) consideration should be given to administering Normal Saline.

The preferred treatment for nausea and vomiting in the pregnant patient with signs of dehydration is fluid rehydration where appropriate. Consider transport times and severity of nausea before treating with ondansetron. Prochlorperazine should not be administered during pregnancy.

Ondansetron comes in the form of an Orally Disintegrating Tablet (ODT). The ODT should be placed in the mouth where it will dissolve in a few seconds and can then be swallowed as normal.

On very rare occasions oral and IV routes of Ondansetron may not be possible. In these circumstances, the intramuscular route is permissible. Due to the medication volume, a 4 mg dose should be administered, however if symptoms are extreme, two injections totalling 8 mg may be required.

Ondansetron is an antagonist at the same receptor sites where Tramadol is active as an analgesic. If a patient is suffering nausea and/or vomiting following Tramadol administration, Ondansetron is not the antiemetic of choice as it will reduce the effectiveness of the analgesia.

Approximately 1 in 2,500 patients will have Long Q-T Syndrome, whether diagnosed or not. Low-level evidence suggests that Ondansetron can prolong the Q-T interval, with a subsequent risk of VT. If Long Q-T Syndrome is known or suspected then Ondansetron should not be administered. If VT (including Torsade de Pointe) follows Ondansetron administration, Amiodarone should NOT be administered as it can further prolong Q-T. Treatment should be focussed on transport with cardioversion or (if unconscious or pulseless) defibrillation.

Prochlorperazine must only be administered via the IM route.
Flowchart

**Status**
- Actual or potential for nausea and vomiting

**Assess for:**
- Nausea and vomiting, or
- Potential spinal injury
- Potential eye trauma
- Potential motion sickness
- Vertigo

**Stop**
- Prochlorperazine must not be given IV

**Undifferentiated nausea and vomiting**

✔️ **Action**
- Ondansetron 4 mg ODT orally
  - Repeat 4 mg after 5-10 minutes if symptoms persist (max. 8 mg ODT, IV or in combination)
  - If the patient is unable to tolerate ODT or IV is in situ, Ondansetron 6 mg IV
- If known allergy or C/I to Ondansetron and ≥18 years, Prochlorperazine 12.5 mg IM

**Vestibular nausea**

✔️ **Action**
- Potential for motion sickness
- Planned aeromedical evacuation
- Vertigo

- If patient age ≥ 21 years
  - Prochlorperazine 12.5 mg IM
- If patient age < 21 years
  - Ondansetron as per nausea and vomiting

**Prophylaxis for:**
- Awake patient with potential spinal injuries and immobilised
- Eye trauma e.g., penetrating eye injury or hyphema

✔️ **Action**
- Ondansetron as per nausea and vomiting
- If known allergy or C/I to Ondansetron and ≥18 years, Prochlorperazine 12.5 mg IM

**Dehydrated**

✔️ **Action**
- Less than adequate perfusion:
  - Consider Normal Saline IV (max. 40 mL/kg) titrated to patient response. Consult for further fluid. If consult unavailable repeat Normal Saline 20 mL/kg IV (total 60 mL / kg)
- Adequate perfusion but significant dehydration:
  - Consider Normal Saline 20 mL/kg IV over 30 minutes
Care Objectives

- Normalisation of blood glucose level

General Notes

Intended patient group

- All adult patients

Management

- Patient may be aggressive during management.
- Ensure IV is patent before administering Dextrose. Extravasation of Dextrose can cause tissue necrosis.
- All IVs should be well flushed before and after Dextrose administration (minimum 10 mL Normal Saline).
- The median time to restoration of normal conscious state after the administration of Dextrose IV can vary from 5 to 15 minutes. A slow response exceeding 15 minutes can also occur occasionally. When considering additional doses of Dextrose IV, it is appropriate to reassess both conscious state and BGL.
- If BGL has returned to normal but the Pt remains altered conscious, consider associated illness (e.g. sepsis, head injury, trauma) and transport without undue delay.
- Further doses of Dextrose 10% IV may be required in some severe hypoglycaemic episodes. Consider consultation if BGL remains less than 4 mmol/L despite Dextrose 10% IV 25 g and unable to administer oral carbohydrates.
- Consult early for Dextrose 10% IV in the setting of an insulin overdose even if BGL > 4 mmol/L and/or patient obeying commands.
- If next meal is more than 20 minutes away, encourage patient to eat a long acting carbohydrate (e.g. sandwich, fruit, glass of milk) to sustain BGL until next meal.
- Maintain general care of unconscious patient and ensure adequate airway and ventilation.

Refusal of transport

- If the patient has fully recovered but not appropriate for the Treat and Refer pathway as per CPG TR0204 Hypoglycaemia, and the patient refuses transport, repeat the advice for transport using friend / relative assistance. If patient still refuses transport, document the refusal and leave patient in care of a responsible third person. Advise the third person of actions to take if symptoms reoccur and of the need to make early contact with LMO.
- Ensure sufficient advice on further management and follow-up if patient refuses transport.
**Flowchart**

**Status**
- Evidence of possible hypoglycaemia
  - e.g. diabetic, altered conscious state, agitation, pale, diaphoretic

**Assess**
- BGL
- Conscious state assessment

**BGL 4 – 11**
- **Action**
  - Consider other causes, e.g.
    - Stroke
    - Seizure
    - Hypovolaemia

**BGL < 4 Responding to commands**
- **Action**
  - Glucose 15 g oral
  - If inadequate response after 15 min:
    - Consider repeat Glucose 15 g oral titrated to response (max. 30 g) or
    - Dextrose IV or
    - Glucagon IM

**BGL < 4 Not responding to commands**
- **Action**
  - IV cannula in a large vein

**Confirm IV patency**
- Dextrose 10% 15 g (150 mL) IV
  - Normal Saline 10 mL flush
  - If GCS or BGL not returned to normal after 5 – 10 min:
    - Dextrose 10% 10 g (100 mL) IV titrating to effect
  - If unable to insert IV:
    - Glucagon 1 IU IM

**Adequate response**
- **Action**
  - Consider Tx
  - If patient has recovered fully consider Treat and Refer pathway as per CPG TR0204 Hypoglycaemia
Adequate fluid replacement where indicated

General Notes

Intended patient group

- All adult patients

Diabetic ketoacidosis (DKA)

- Any patient with
  - a pre-existing history of diabetes
  - BGL > 11 mmol/L, and
  - clinical features of DKA (e.g. confusion, signs of dehydration, Kussmaul’s breathing) should be transported to hospital for further investigation.

- Approximately one half of diabetic ketoacidosis (DKA) cases will present with low to moderate hyperglycaemia (11-29 mmol/L).

- Occasionally, DKA will occur in patients without previously diagnosed diabetes. Paramedics should be vigilant to assess BGL in all patients with signs or symptoms suggestive of hyperglycaemia.

- Kussmaul’s breathing can often be confused for hyperventilation related to anxiety. Any patient with a BGL > 11mmol/L, clinical signs of dehydration and hyperventilation requires further investigation in hospital.

- Clinical features alone may not be sufficient to differentiate between DKA and a Hyperosmolar Hyperglycaemic State (HHS).

Hyperosmolar Hyperglycaemic State (HHS)

- Patients with HHS
  - typically older
  - have higher BGL readings (> 30mmol/L)
  - usually do not present with clinical features of DKA (e.g. Kussmaul’s breathing).

Management

- There is no value in differentiating between hyperglycaemic crises in the prehospital setting. Adequate fluid replacement in patients with less than adequate perfusion should be aim of care in symptomatic patients.

- Patients with DKA/HHS who are adequately perfused do not require bolus doses of Normal Saline in the prehospital setting. If transport time is prolonged (> 1 hour), consider a maintenance dose of Normal Saline IV 500 mL/hr.

- Patients should not be encouraged to self-administer additional doses of insulin prior to transport to hospital.
Intubation

- Removing the patient’s ability to achieve compensatory respiratory alkalosis (i.e. Kussmaul’s respirations) can lead to poorer outcomes in DKA patients. As such, endotracheal intubation should be avoided except in cases where the patient is severely obtunded.
**Status**
- Evidence of possible hyperglycaemia, e.g.
  - Confusion
  - Dehydration
  - Tachypnoea
  - Polydipsia
  - Polyuria
  - Kussmaul’s breathing

**Assess**
- BGL
- Perfusion status assessment

**BGL 4 – 11 mmol/L**
- Consider other causes, e.g.
  - Dehydration
  - Sepsis
  - Metabolic disorders

**BGL >11 mmol/L**
- Less than adequate perfusion **AND**
- Clinical features of DKA/HHS, e.g.
  - Dehydration
  - Tachypnoea
  - Polydipsia
  - Polyphagia
  - Polyuria
  - Kussmaul’s breathing
  - Hx diabetes

- **Normal Saline 20 mL/kg IV** titrated to perfusion status
  - Consult if further doses are required to maintain adequate perfusion.
  - Consider reduced fluid volume for elderly or impaired renal/cardiac function.
  - Consider antiemetic as per CPG A0701 Nausea and Vomiting
For the purposes of this CPG, Status Epilepticus (SE) refers to either \( \geq 5 \text{ minutes} \) of continuous seizure activity OR multiple seizures without full recovery of consciousness (i.e. back to baseline) between seizures.

Generalised Convulsive Status Epilepticus (GCSE) is characterised by generalised tonic-clonic movements of the extremities with altered conscious state.

Subtle SE may develop from prolonged or uncontrolled GCSE and is characterised by coma and ongoing electrographical seizure activity with or without subtle convulsive movements (e.g. rhythmic muscle twitches or tonic eye deviation). Subtle SE is difficult to diagnose in the pre-hospital environment but should be considered in patients who are witnessed to have generalised tonic-clonic convulsions initially and present with ongoing coma and no improvement in conscious state (with or without subtle convulsive movements).

For seizures other than GCSE, **Midazolam** may only be administered following consultation via the Clinician.

Some patients may be prescribed buccal / intranasal midazolam or rectal diazepam to manage seizures.

If a single seizure has spontaneously terminated consider **CPG TR0207 Treat and refer Seizures**.

Ensure accurate dose calculation and confirm with other Paramedics on scene.

Frequent errors in drug dosage administration occur within AV in this CPG.

**Midazolam** can have pronounced effects on BP, conscious state, ventilations and airway tone.

**Seizures in Pregnancy**

Consider eclampsia in pregnant patients with no prior seizure history or have been diagnosed with pre eclampsia.

- Refer to **CPG O0202 Pre-eclampsia / Eclampsia**
- Eclamptic seizures are rare (0.1% of all births) and usually self-limiting

**Midazolam** crosses the placenta and administration in pregnant patients may cause adverse effects to the baby. However GCSE is life-threatening to both mother and baby and **Midazolam** is therefore still indicated in this situation.

Contact Paediatric Infant Perinatal Emergency Retrieval (PIPER) for advice via Clinician or on 1300 137 650.
Seizures CPG A0703

Flowchart

1. **Status**
   - Seizure activity

2. **Assess**
   - Evidence of Status Epilepticus (≥ 5 minutes or ≥ 2 seizures without recovery)
     - GCSE or other SE (including subtle SE)
     - Consider other causes e.g. hypoglycaemia, hypoxia, head trauma, stroke / ICH, electrolyte disturbances, meningitis
     - Consider patient’s own management plan and treatment already given

3. **Seizure activity ceased / Other SE / Subtle SE**
   - **Action**
     - Monitor airway, ventilation, conscious state and BP
     - If subtle SE suspected, consider time-critical transport and consult for Midazolam
     - If patient has recovered fully consider Treat and Refer pathway as per CPG TR0207 Treat and Refer - Seizures

4. **Generalised Convulsive SE**
   - **Action**
     - Manage airway and ventilation as required
     - If airway patient, administer high-flow O₂ as per CPG A0001 Oxygen Therapy
     - Midazolam 10 mg IM
       - Small (< 60 kg), frail or elderly patients should be administered Midazolam 5 mg IM, repeated once at a 5 minute interval if required
       - If IV in situ: Midazolam 5 mg IV
         - Small (< 60 kg), frail or elderly patients should be administered Midazolam 2 mg IV

5. **Seizure activity ceases**
   - **Action**
     - BLS
     - Continue to monitor airway, ventilation, conscious state and BP

6. **No response after 5 minutes**
   - **Action**
     - Midazolam 2 – 5 mg IV repeated at 2 – 5 minute intervals if required (Max. dose 30 mg, IM + IV)
       - Small (< 60 kg), frail or elderly patients should be administered Midazolam 2 mg IV, repeated at 2 – 5 minute intervals if required
     - Consult for further doses
     - Consider ETT as per CPG A0302 Endotracheal Intubation

7. **No response after 10 minutes**
   - **Action**
     - No IV access / no accreditation
     - If patient had full dose initially (not small/frail/elderly) repeat Midazolam 10 mg IM once only
     - Consult for further doses
     - Continue to monitor airway, ventilation, conscious state and BP

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Signs of allergy include a range of cutaneous manifestations and/or a history of allergen exposure. This history can include food, bites/stings, medications or the allergen can be unknown.

In rare circumstances anaphylaxis can occur with symptoms in an isolated body system. If a patient has hypotension following exposure to a known allergen for them consider treating as per anaphylaxis.

International guidelines recommend IM administration of Adrenaline to the anterolateral mid-thigh as the preferred site due to improved absorption. Whilst remaining alert to patient comfort and dignity issues, the mid-lateral thigh should be considered the preferred site of administration where possible.

**IV Adrenaline** should be reserved for the patient who is extremely poorly perfused or facing impending cardiac arrest.

**IV Adrenaline** should be subsequent to **IM Adrenaline** in all cases with an initial IM therapy option selected for each anaphylaxis patient regardless of presentation.

**IV Adrenaline** should preferably be administered via a syringe pump infusion where possible.

For patients persistently unresponsive to **Adrenaline** (especially if taking beta blocking medication) the administration of **Glucagon 1-2 IU IM** or IV can be considered under medical consultation. **Glucagon** administration must not delay further **Adrenaline** administration.

Anaphylaxis can be difficult to identify. Cutaneous features are common though not mandatory. Irrespective of known allergen exposure, if 2 or more systemic manifestations are observed then anaphylaxis should be accepted.

Deaths from anaphylaxis are far more likely to be associated with delay in management rather than due to inadvertent administration of **Adrenaline**.

All patients with suspected anaphylaxis must be advised that they should be transported to hospital regardless of the severity of their presentation or response to management. International guidelines recommend at least 4 hours of observation following treatment.

Different brands of self-administered adrenaline autoinjectors will deliver different doses of adrenaline. In the absence of Paramedic intervention, an auto-injector is an appropriate treatment.

Inhaled therapy may be of benefit in management of anaphylaxis though should always be secondary therapy. **Salbutamol** may be of use for persistent bronchospasm and **Nebulised Adrenaline** may be of use for persistent upper airway oedema and stridor.

Where poor perfusion persists despite initial **Adrenaline** therapy, large volumes of fluid may be extravasating. IV fluid therapy is indicated to support vasopressor administration.

**Preparation of Adrenaline infusion (syringe pump):**

- **Adrenaline 3 mg** added to make **50 mL** with **5% Dextrose** or **Normal Saline 1 mL = 60 mcg**
  
  1 mL/hr = 1 mcg/min
Flowchart

**Stop**
- If Pt has Hx of anaphylaxis and has received adrenaline prior to arrival they MUST be Tx to hospital for observation and follow up
- Paramedics must recommend transport to hospital by emergency ambulance for observation and follow up if the patient has received adrenaline or there is ANY possibility of the patient having suffered an anaphylactic reaction

**Assess**
- Sudden onset of symptoms (minutes to hrs) AND
- Two or more of R.A.S.H. with or without confirmed antigen exposure:
  - R: Respiratory distress (SOB, wheeze, cough, stridor)
  - A: Abdominal symptoms (nausea, vomiting, diarrhoea, abdominal pain/cramps)
  - S: Skin/mucosal symptoms (hives, welts, itch, flushing, angioedema, swollen lips/tongue)
  - H: Hypotension (or altered conscious state) OR
- Isolated hypotension (SBP < 90 mmHg) following exposure to known antigen

**No anaphylaxis**
- **Action**
  - BLS
  - Reasses for potential deterioration
  - Consider Tx for observation and further Mx

**Refusal of transport**
If Pt has had a possible anaphylactic reaction (irrespective of severity) then they should be transported unless they refuse (patients < 18 MUST be transported). If they refuse Tx then where possible they should be:
- Strongly encouraged to consent to transport AND
- Advised of the risk and consequences of dilatation (including death)
If they continue to refuse, they should be:
- Left with a responsible third party
- Given clear instructions on when to call back if required
- Advised to follow up with their LMO

**Irrespective of symptom resolution**
- **Action**
  - Tx
  - Reasses an en route
  - Monitor for recurring symptoms

**Anaphylaxis / Severe allergic reaction**
- **Action**
  - Monitor cardiac rhythm
  - Adrenaline 500 mcg IM (1:1,000)
    - Repeat 500 mcg IM at 5 minute intervals until satisfactory results or side effects occur
    - Small (<60 kg), frail or elderly adults should be administered Adrenaline 300 mcg IM instead
  - Provide O2 as per CPG A0001 Oxygen Therapy
  - Mx respiratory distress as indicated
    - Rx bronchodilators with Salbutamol as per CPG A0601 Asthma
    - Consider nebulised Adrenaline for upper airway oedema as per CPG A0903 upper airway obstruction
  - Less than adequate perfusion:
    - Consider Normal Saline IV (max. 40 mL/kg) titrated to patient response
    - Consult for further fluid. If consult unavailable repeat Normal Saline 20 mL / kg IV
  - Where possible, do not allow patient to stand or walk

**Inadequate response**
- **Action**
  - Adrenaline as per CPG A0706 Inadequate Perfusion (Non-cardiogenic / Non-hypovolaemic)
    - Consider intubation

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Related Resources

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

Sepsis criteria are relevant in the presence of an infection or severe clinical insult such as multi trauma leading to systemic inflammatory response syndrome (SIRS). 2 or more of:

- Temp > 38°C or < 36°C
- HR > 90 bpm
- RR > 20/minute
- BP < 90 mmHg

**Adrenaline infusion > 50 mcg/minute** may be required to manage these patients. Ensure delivery system is fully operational (e.g. tube not kinked, IV patent) prior to increasing dose.

Unstable patients may require bolus **Adrenaline** concurrently with the infusion.

**Adrenaline infusion**
Adrenaline 3 mg added to make 50 mL with 5% Dextrose or Normal Saline
1 mL/hr = 1 mcg/min

If sepsis is suspected and prolonged transport times exist (>1 hour) consider **Ceftriaxone 1g IV** (consult).
Flowchart

**Inadeq. Perfusion (Non-cardiogenic / Non-hypovolaemic)**

**Status**
- Suspected sepsis
- Other causes of non-cardiogenic, non-hypovolaemic shock

**Assess**
- Perfusion status
- Respiratory status
- Sepsis criteria
- Other possible causes

**Inadequate or extremely poor perfusion**

**Action**
- If sepsis is suspected and chest is clear and MICA is not immediately available:
  - Confirm request for MICA support
- Normal Saline up to 20 mL/kg IV over 30 minutes
- Normal Saline up to 20 mL/kg IV

**Adequate perfusion**

**Action**
- BLS
- Tx

**Inadequate or extremely poor perfusion persists**

**Action**
- Adrenaline infusion (3 mg in 50 mL D5W/Normal Saline) commencing at 5 mcg/minute (5 mL/hr)
  - Increase by 5 mcg/minute at 2 minute intervals until adequate perfusion or side effects
  - If poor perfusion persists, reassess Pt and delivery system prior to increasing rate beyond 50 mcg/minute
  - If syringe pump unavailable
    - Adrenaline 10 mcg IV
      - Repeat 10 mcg at 2 minute intervals until adequate perfusion or side effects
      - If poor response
        - Adrenaline 50 - 100 mcg IV as required
        - Doses > 100 mcg may be required
- If chest clear, continue Normal Saline 20 mL/kg IV boluses titrated to patient response (max. 40 mL/kg)
- Consult for further fluid. If consult unavailable repeat Normal Saline 20 mL/kg IV (max. 60 mL/kg)

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
A typical purpuric rash may be subtle in some cases and present as a single ‘spot’ only.

The presence of rapid onset symptoms of sepsis +/- rash may be a sign of meningococcal septicaemia.

Meningococcal is transmitted by close personal exposure to airway secretions / droplets.

Ensure face mask protection especially during intubation / suctioning.

Ensure medical follow up for staff post exposure.

Consider consultation where diagnosis is uncertain.

Ceftriaxone preparation

- Dilute **Ceftriaxone 1 g** with **9.5 mL of Water for Injection** and administer **1 g IV** over approximately **2 minutes**.

- If unable to obtain IV access, or not accredited in IV cannulation, dilute **Ceftriaxone 1 g** with **3.5 mL 1% Lignocaine HCL** and administer **1 g IM** into the upper lateral thigh or other large muscle mass.
Flowchart

**Status**
- Suspected meningococcal septicaemia

**PPE**

**Confirm meningococcal septicaemia**
- Typical purpuric rash
- Septicaemia signs
  - Fever, rigor, joint and muscle pain
  - Cold hands and feet
  - Tachycardia, hypotension
  - Tachypnoea
- Meningeal signs
  - Headache, photophobia, neck stiffness
  - Nausea and vomiting
  - Altered conscious state

**IV access**

**Action**
- Ceftriaxone 1 g IV
  - Dilute with Water for Injection to make 10 mL
  - Administer slowly over 2 minutes
- If inadequate perfusion Rx as per CPG A0705 Inadequate Perfusion

**No IV access**

**Action**
- Unable to gain
- Not IV accredited
- Ceftriaxone 1 g IM
  - Dilute with 3.5 mL 1% Lignocaine HCL to make 4 mL
  - Administer into upper lateral thigh or other large muscle mass
If patient refuses transport, advise the patient and responsible third person (if available) of follow-up, counselling facilities and actions to take for continuing care if symptoms recur.

For young persons, Paramedics should strongly encourage them to make contact with a responsible adult.

Paramedics should contact police if in their professional opinion the patient appears to be a victim of or at increased risk of:
- Family violence (e.g. from a parent, guardian or care giver).
- Sexual exploitation or abuse.

Or if:
- The supply of drugs appears to be from a parent / guardian / caregiver.
- There is other evidence of child abuse / maltreatment or evidence of serious untreated injuries.

If the patient claims to have taken an OD of a potentially lifethreatening substance or as a suicide attempt then they must be transported to hospital. Police assistance should be sought to facilitate this as required.

Documentation of refusal and actions taken must be recorded on the PCR.

When dealing with cases of OD, if Paramedics are unfamiliar with a substance or unsure of the effects it may have, then consultation with Poisons Information should take place. They can be contacted via the Clinician, or on 13 11 26.

Supportive Care

- Provide supportive care (all cases)
  - Provide appropriate airway management and ventilatory support.
  - If patient is in an altered conscious state, assess BGL and if necessary manage as per CPG A0702 Hypoglycaemia.
  - If patient is bradycardic with poor perfusion manage as per CPG A0402 Bradycardia.
  - If patient is inadequately perfused, manage as per appropriate CPG.
  - Assess patient temperature and manage as per CPG A0901 Hypothermia / Cold Exposure, or CPG A0902 Environmental Hyperthermia / Heat Stress.

Further Assessment

- Confirm clinical evidence of substance use or exposure
  - Identify which substance/s are involved and collect any packets if possible.
  - Identify by which route the substance/s have been taken (e.g. ingestion).
  - Establish the time the substance/s were taken.
  - Establish the amount of substance/s taken.
  - Establish what the substance/s were mixed with when taken (e.g. alcohol, water).
  - Establish if any treatment has been initiated prior to Ambulance arrival (e.g. induced vomiting).
The ‘Other opioid overdose’ arm of this CPG should be used for:

- Prescription opioid medication overdose (e.g. oxycodone, morphine, codeine, fentanyl patches, methadone)
- Iatrogenic opioid overdose (e.g. secondary to opioid analgesia)
- Polypharmacy overdose involving opioids (e.g. opioid and methamphetamine)
- Unknown cause of opioid overdose (heroin not suspected)

Patients who are managed using the ‘Other opioid overdose’ arm should receive supportive care, transport to hospital and titrated doses of Naloxone to target the return of adequate ventilation. Complete reversal of symptoms is generally not advised in these patients.

Synthetic opioids, especially fentanyl analogues are increasingly used recreationally. These may require higher doses of Naloxone than usual to reverse their effects.

**General Care**

- Ensure paramedic health and safety
- If inadequate response after 10 minutes, the patient is likely to require transport without delay
- Maintain general care of the unconscious patient and ensure adequate airway and ventilation
- Consider other causes e.g. head injury, hypoglycaemia, polypharmacy OD.
- Beware of the patient becoming aggressive
Flowchart

- **Status**
  - Possible opioid OD

- **Stop**
  - Ensure personal / crew safety
  - Scene may have contaminated syringes

- **Assess**
  - Exclude other causes of altered consciousness
  - Confirm clinical signs of opioid OD
  - Assess most likely substance(s) involved

- **Heroin overdose**
  - **Action**
    - Assist and maintain airway / ventilation
    - Naloxone 1.6 mg – 2 mg IM

- **Other opioid overdose**
  - **Action**
    - Assist and maintain airway / ventilation
    - Naloxone 100 mcg IV
      - Repeat Naloxone 100 mcg IV every 2 minutes (max. 2 mg) until patient is adequately self-ventilating
    - If unable to insert IV – Naloxone 400 mcg IM (single dose only)
    - Consider airway Mx CPG A0301 Supra-GLottic Airway
    - Tx without delay
    - Consider ETT as per CPG A0302 Endotracheal Intubation

- **Adequate response**
  - Consider Tx
  - If patient presents with an isolated heroin overdose, which has responded to Naloxone with full recovery consider Treat and Refer pathway as per CPG TR0203 Treat and Refer - Heroin Overdose

- **Inadequate response after 10 minutes**
  - **Action**
    - Tx without delay
    - Consider airway Mx CPG A0301 Supra-GLottic Airway
    - Consider ETT as per CPG A0302 Endotracheal Intubation
**Hyperthermic psychostimulant OD**

In hyperthermic psychostimulant OD the trigger point for intervention in the management of agitation/aggression is lowered. Sedation should be initiated early to assist with cooling and avoid further increases in temperature associated with agitation.

### Flowchart

1. **Status**
   - Sedative agents
   - Psychostimulants

2. **Assess**
   - Substance involved

3. **Stop**
   - Ensure personal/crew safety
   - Be aware of the potential for agitation/aggression/violence

**Sedative agents**
- **Action**
  - Pt may require airway Mx
  - Mx agitation/aggression as per CPG A0708 Agitation
  - Mx inadequate perfusion as per CPG A0705 Inadequate Perfusion

**Psychostimulants**
- **Action**
  - Reduce stimuli by calming and controlling the Pt’s environment
  - Mx seizures as per CPG A0703 Seizures
  - Mx cardiac chest pain as per CPG A0401 Acute Coronary Syndromes
  - Mx temp as per CPG A0902 Hyperthermia/
    Heat Stress or A0901 Hypothermia/Cold exposure
  - Mx agitation/aggression as per CPG A0708 Agitation/Delirium
Signs and symptoms of TCA toxicity

- Mild to moderate OD
  - Drowsiness, confusion
  - Tachycardia
  - Slurred speech
  - Hyperreflexia
  - Ataxia
  - Mild hypertension
  - Dry mucus membranes
  - Respiratory depression

- Severe toxicity (within 6 hours ingestion)
  - Coma
  - Respiratory depression / hypoventilation
  - Conduction delays
  - PVCs
  - SVT
  - VT
  - Hypotension
  - Seizures
  - ECG changes

This could lead to aspiration, hyperthermia, rhabdomyolysis and APO.

TCAs may be prescribed to treat medical conditions other than depression (e.g. chronic pain).

Common tricyclic antidepressants

<table>
<thead>
<tr>
<th>Generic name(s)</th>
<th>Brand name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline (most commonly prescribed)</td>
<td>Endep, Entrip</td>
</tr>
<tr>
<td>Clomipramine</td>
<td>Anafranil, Placil</td>
</tr>
<tr>
<td>Dosulepin (dothiepin)</td>
<td>Dothep</td>
</tr>
<tr>
<td>Doxepin</td>
<td>Depran, Sinequan</td>
</tr>
<tr>
<td>Imipramine</td>
<td>Tofranil</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>Allegron, Nortitabs</td>
</tr>
</tbody>
</table>
Flowchart

**Status**
- Possible TCA OD

**Assess**
- Substance involved
- Perfusion status
- ECG criteria

**Signs of TCA toxicity**
- Any of the following
  - QRS > 0.12 sec
  - Hypotension
  - Ventricular arrhythmias

**Stop**
- Amiodarone is C/I in the setting of confirmed or suspected TCA OD

**Action**
- Sodium Bicarbonate 8.4% 100 mL IV given over 3 minutes
  - Repeat 100 mL IV after 10 minutes if signs of toxicity persist
  - Consult for further doses if signs of toxicity persist
- Consider ETT as per CPG A0302 Endotracheal Intubation if signs of toxicity and GCS < 10 persist after initial Mx
  - Hyperventilate with 100% O₂ - rate 20 - 24/minute
  - EtCO₂ target 20 - 25 mmHg if intubated

**No signs of toxicity**
- Action
  - Consider potential to develop signs of toxicity
**Care Objectives**

- Reduction of patient agitation
- Management of clinical causes of agitation
- Maintain safe environment for patients, paramedics, family and bystanders
- Maintain patient dignity and empathetic communication

**General Notes**

**Intended patient types**

This CPG applies to any patient who presents with agitation, aggression, or violent behaviour.

Where clinically indicated, it is permissible to use this guideline to care for the following patient groups:

- Compulsory patients under the Mental Health Act 2014, and
- Patients in police custody under Section 351 of the Mental Health Act 2014

**Assessment**

The descriptors below outline the spectrum of behaviour which paramedics are likely to care for.

Assessment should be ongoing as a patient’s condition is likely to be dynamic and will move within the spectrum of agitation in either direction. For example, a patient initially managed under Mild or Moderate Agitation may escalate to a higher level of risk than when initially assessed.

Cardiac and SpO2 monitoring must be continuous in the sedated patient. Respiratory rate monitoring is also imperative and where available should be aided by the use of an ETCO2 nasal sample set.

At a minimum, documented observation must be undertaken every 15 mins and include: VSS, GCS, sedation score, check for injury from mechanical restraints, check neurovascular status of limbs that are restrained.

**Mild agitation**

- Cooperative, not aggressive.
- Anxious, pacing, restless (can’t sit still), excessive talking
- Able to safely take oral medication (self-administer)

**Moderate agitation**

- Loud outbursts, frequent non-purposeful movements
- Not aggressive or violent
- Risk expected to be controlled with Midazolam / analgesia alone

**Severe agitation**

- Uncooperative, combative, violent, immediate danger to patient and staff
• Patient fighting against overwhelming force (e.g. people holding them down)
• Lacks capacity
• The priority is to protect patients and staff

Psychostimulant affected patients

• Patients affected by methamphetamine may present with severe agitation and violence. Doses of Midazolam that would usually be effective in other scenarios may be ineffective. These patients may be managed as per the Severe Agitation section of this CPG using Ketamine if necessary.
• Ketamine is used only where necessary as it does not treat the underlying cause and may worsen any serotonin syndrome. Serotonin syndrome should be treated with benzodiazepines (midazolam) once controlled with ketamine to reduce motor tone and temperature (ALS consult).
• Cool the patient as per CPG A0902 Hyperthermia

Traumatic brain injury

• Agitation in traumatic or hypoxic brain injury must be managed with judicious analgesia.
• The hypotensive effects of midazolam can be detrimental to patient outcomes.
• In patients with mild to moderate acute traumatic brain injury (GCS 10 – 14), sedation can only be given after consultation with the AV Clinician.

Elderly / frail patients

• Elderly patients can present with delirium, which is an acute and reversible change in cognitive function and distinct from dementia. Consider and exclude clinical causes as per CPG.
• Elderly and frail patients are particularly sensitive to the effects of sedation. If it is safe to do so, the use of Olanzapine as the initial pharmacological agent is likely to be effective for this patient group. This may avoid or lessen the dose of midazolam required.
• Aim to use the lowest dose possible and carefully monitor for side effects.

Paediatric and adolescent patients

• < 16 years old: RCH (or MCH if the child usually attends that hospital) must be consulted prior to any sedation.
• 16 and 17 years old: Consult with Clinician for most appropriate destination hospital.

Patient care

Safety

• Patient and paramedic safety is paramount at all times. Do not attempt any element of this CPG unless all necessary assistance is available.
• Paramedics should continue to utilise their Dynamic Risk Assessment skills throughout the case.
• Verbal de-escalation and communication with the patient is essential and should be maintained throughout all phases of care.
Prior to administering sedation and/or restraint, clear communication with all parties involved in restraining the patient is a key factor in reducing the risk of needle-stick or other injuries.

Physical restraint

- Restraint devices may be used without the use of sedation in circumstances where the patient will not sustain further harm by fighting against the restraints.
- Restraint devices should be removed and the patient repositioned if there is risk or harm occurring to the patient; e.g. asphyxia, aspiration.
- The indications for the use of restraints, type of restraint and the time of application and removal must be documented on the PCR.

Sedation

- Cutting clothing or administration of an IM injection through patient clothing is to be avoided where possible.
- *Rousable drowsiness* is defined as the patient being asleep but rousing if their name is called.
- Consider the use of Olanzapine to maintain a calm state where the agitated patient has responded to de-escalation yet has a propensity to re-escalate. NB. This does not apply to patients with no symptoms of anxiety or agitation who have a past history of agitation.
- A combination of sedative agents may be appropriate where the patient acuity changes. For example, the patient who has received midazolam may subsequently be administered olanzapine to achieve and maintain optimal outcomes.
- Use of the Sedation Assessment Tool will assist in ongoing monitoring, clinical handover and case documentation.
- Consideration of the SAT score may guide pharmacological approach as per table below.

<table>
<thead>
<tr>
<th>SCORE</th>
<th>RESPONSIVENESS</th>
<th>SPEECH</th>
<th>Sedation agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>+3</td>
<td>Combative, violent out of control</td>
<td>Continual loud outbursts</td>
<td>Ketamine</td>
</tr>
<tr>
<td>+2</td>
<td>Very anxious and agitated</td>
<td>Loud outbursts</td>
<td>Midazolam</td>
</tr>
<tr>
<td>+1</td>
<td>Anxious / restless</td>
<td>Normal / talkative</td>
<td>Olanzapine</td>
</tr>
<tr>
<td>0</td>
<td>Awake and calm / cooperative</td>
<td>Speaks normally</td>
<td>-</td>
</tr>
<tr>
<td>-1</td>
<td>Asleep but rouses if name is called</td>
<td>Slurring or prominent slowing</td>
<td>-</td>
</tr>
<tr>
<td>-2</td>
<td>Responds to physical stimulation</td>
<td>Few recognizable words</td>
<td>-</td>
</tr>
<tr>
<td>-3</td>
<td>No response to stimulation</td>
<td>Nil</td>
<td>-</td>
</tr>
</tbody>
</table>

Post-sedation care

In all cases where sedation is administered, supportive care should be provided as required including:

- Airway management
- Supplemental $\text{O}_2$ as per CPG A0001 Oxygen Therapy (routine if sedated with Ketamine)
- Use of capnography where appropriate equipment is available. Please note that nasal sampling
capnography will assist to monitor respiratory rate, however the ETCO$_2$ readings may not be reliable.

- Perfusion management as per CPG A0705 Inadequate Perfusion (Noncardiogenic / Non-hypovolaemic)
- Temperature management as per CPG A0901 Hypothermia or CPG A902 Hyperthermia
- Reassessment and management of clinical causes of agitation
- Insert IV
- **Ketamine**: Management of hypersalivation. On most occasions suctioning will be sufficient. Where hypersalivation becomes difficult to manage or the airway is compromised, treatment may include administration of Atropine 600 mcg IV/IM (MICA)
Flowchart

**Status**
- Agitated patient

**Stop**
- **Patient & Paramedic safety is paramount**
  - Observe for and manage as appropriate:
    - Hazards
    - Body fluids
    - Violence
    - Sharps
    - Clear egress
    - Reduce patient stimuli

**Assess**
- Assess using Sedation Assessment Tool
- Manage clinical causes as far as possible (i.e. A/EIOU/TIPS)
- Consider grief or extreme stress
- Severe agitation will be undifferentiated agitation as complete assessment will usually be impossible. As soon as practicable after the patient is controlled, reversible causes should be assessed and treated if identified.

**Able to manage without sedation or restraint**
- **Action**
  - Manage causes as per appropriate CPG
  - Ongoing monitoring for signs of change in agitation level of risk
  - Transport to appropriate destination ensuring sufficient assistance in transit
  - Provide early notification to receiving hospital as appropriate

**Requires restraint / sedation**
- **Action**
  - Pt does not respond to verbal de-escalation
  - Clinical causes excluded as far as possible
  - Patient is a risk to themselves or others

**Stop**
- Ensure sufficient physical assistance
- If mild to moderate head injury (GCS 10–14) manage pain and consult if sedation required
- All sedation under this CPG is aiming for rousable drowsiness
- Apply or remove restraints as appropriate to level of risk
Agitation

**Mild agitation (SAT score +1)**

**Action**

If patient is cooperative and capable of safely taking an oral medication:

- **Olanzapine 10 mg ODT orally**
  - Administer lower dose (5mg ODT orally) for frail, elderly, weight <60kg, or significant effect from sedating drug/alcohol involvement
  - Repeat dose after 20 minutes if patient remains mildly agitated

**Moderate agitation (SAT score +2)**

**Action**

- **Midazolam 5 – 10 mg IM**
  - Administer 2.5 – 5 mg IM for elderly, frail, weight < 60 kg, SBP < 100 mmHg or significant effect from sedating drug/alcohol involvement
  - Repeat dose after 10 minutes if necessary, titrated to patient response
  - Maximum total dose 20 mg. Consult if patient remains agitated
  - Consider Olanzapine 10 mg ODT orally as per Mild Agitation if patient remains agitated but becomes co-operative.

- **Midazolam 2.5 – 5 mg IV**
  - Administer lower doses (1 – 2 mg IV) for elderly, frail, weight < 60 kg, SBP < 100 mmHg or significant effect from sedating drug/alcohol involvement
  - Repeat dose at 5 minute intervals if necessary, titrated to patient response
  - Maximum total dose 20 mg. Consult if patient remains agitated
  - IM injections may be indicated until IV access can be established

**Severe agitation (SAT score +3)**

**Action**

- **Administer Ketamine IM:**
  - < 60 kg 200 mg
  - 60 – 90 kg 300 mg
  - > 90 kg 400 mg

- Consult for further ketamine if required

- If the patient is hyperthermic or has increased muscle tone, consult Clinician for Midazolam (IV or IM)

- If an IV is in situ, Ketamine 50 – 100 mg IV

- Once agitation is controlled and an IV in situ, maintain sedation with Midazolam 2.5 – 5 mg IV at 5 minute intervals if necessary.

- If the patient is hyperthermic or has increased muscle tone, administer Midazolam 2.5 – 5 mg IV.
  - Temperature management as per CPG A902 Hyperthermia
  - Maximum total dose of Midazolam (IM + IV) 20 mg

**Transport patient to hospital**

**Action**

Pre-notify receiving hospital where the patient is:

- physically or mechanically restrained
- escorted by police
- agitated with a sedation assessment tool (SAT) score greater than zero
- sedated with a SAT score less than zero.
Related Resources

- CPG Walkthrough - Agitation
General Notes

- Notification to receiving hospital essential to allow for patient isolation and decontamination.
- The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used not only commercially but also domestically.
- Given potential contamination by a possible organophosphate, the container identifying trade and generic names should be identified and the Poisons Information Centre contacted for confirmation and advice (via Clinician or 13 11 26).
- In symptomatic cases, MICA Paramedics should consider calling for extra MICA support early as imprest levels of **Atropine** may be quickly exhausted if scene times or transport times are prolonged.

General Care

- Where possible, remove contaminated clothing and wash skin thoroughly with soap and water.
- If possible minimise the number of staff exposed.
- Attempt to minimise transfers between vehicles in order to reduce risk of vehicle or equipment contamination and staff exposure.

Flowchart

1. **Status**
   - Possible organophosphate exposure

2. **Stop**
   - Avoid self contamination - wear PPE
   - Decontaminate Pt if possible

3. **Confirm evidence of suspected poisoning**
   - Cholinergic effects: salivation, bronchospasm, sweating, nausea or bradycardia
   - The key word to look for on the label is anticholinesterase

4. **Evidence of excessive cholinergic effects**
   - Salivation compromising the airway or bronchospasm and/or
   - Bradycardia with inadequate or extremely poor perfusion

5. **No excessive cholinergic effects**
   - **Action**
     - Tx to nearest appropriate hospital
     - Monitor for excessive cholinergic effects

6. **Excessive cholinergic effects**
   - **Action**
     - Atropine 1200 mcg IV
       - Repeat 1200 mcg IV at 5 minute intervals until excessive cholinergic effects resolve
     - Consult with receiving hospital for further Mx if required
Transport the patient even if the symptoms are relieved as this presentation meets the criteria of autonomic dysreflexia, a medical emergency that requires identification of probable cause and treatment in hospital to prevent cerebrovascular catastrophe.

**General Notes**

- Possible autonomic dysreflexia

**Flowchart**

1. **Status**
   - Possible autonomic dysreflexia

2. **Confirm Autonomic Dysreflexia**
   - Previous spinal cord injury at T8 or above
     - Severe headache and/or
     - SBP > 160 mmHg

3. **Identify and Rx possible causes - remove the stimulus**
   - If distended bladder (common), ensure indwelling catheter is not kinked
   - Mx pain, e.g. fractures, burns, labour

4. **If systolic BP remains > 160 mmHg**

5. **Adequate response**
   - GTN 300 mcg S/L (no prev. admin) or
   - GTN 600 mcg S/L
   - Tx to nearest appropriate hospital

6. **Inadequate response - BP remains > 160 mmHg**

7. **Action**
   - Repeat initial dose of GTN at 10 minute intervals until either:
     - Symptoms resolve
     - Onset of side effects
     - BP < 160 mmHg
   - Tx to nearest appropriate hospital
**Care Objectives**

- Assess suspected Stroke / TIA cases using MASS
- Transport to appropriate destination (thrombolysing, ECR or neurosurgical stroke centre)
- Hospital pre-notification

**General Notes**

**Intended patient group**

- This guideline applies to all patients who have had neurological signs / symptoms (whether resolved or not) that may be a stroke or TIA.

**Stroke**

- Patients who still have signs / symptoms at point of assessment, even if they are improving, are suspected of having a stroke.
- O₂ therapy is reserved for patients with SpO₂ <92%, as per CPG A0001 Oxygen Therapy.

**Stroke mimics**

- Hypo/hyperglycaemia
- Seizures
- Sepsis
- Intoxication (drug / alcohol)
- Brain tumour
- Inner ear disorder
- Subdural haematoma (SDH)
- Syncope
- Migraine
- Electrolyte disturbance

**Significant co-morbidities**

Includes:

- Dementia
- Significant pre-existing physical disability

Co-morbidities do not automatically exclude a patient from stroke interventions.

If the patient is within the treatment timeframe they should be treated with appropriate urgency and the medical history discussed during the hospital notification to aid in further clinical decision-making.
Transient Ischaemic Attack (TIA)

- TIA can only be diagnosed following investigation in hospital.
- Any patient suspected of having a TIA should be transported.

Intracranial Haemorrhage (ICH)

- Approximately 15-20% of stroke are intracranial haemorrhage and have the potential for rapid deterioration.
- Ischaemic stroke and ICH are not distinguishable clinically but ICH is more likely where there is/was:
  - Rapid deterioration in conscious state and GCS < 8
  - Complaint of severe headache
  - Nausea / vomiting
  - Bradycardia / hypertension
- Consider primary transport to a neurosurgical centre for suspected ICH including the use of AAV from rural areas.
- Opioid analgesia should be used with caution due to the risk of deterioration in conscious state.
- **Prochlorperazine** is unlikely to have a beneficial effect for ICH / SAH. It should only be given if the patient has nausea / vomiting and **ondansetron** cannot be given.

Symptom onset time

- The thrombolysis eligibility timeframe is potentially up to 12 hours from symptom onset.
- Symptom onset time is measured from the time the patient was last seen well.
- If the patient wakes with symptoms, this is considered to be the time they went to bed if they did not get up overnight.

Thrombolysis

- Most large metropolitan hospitals and rural hospitals participating in the Victorian Stroke Telemedicine program offer thrombolysis and stroke unit care. If unsure consult with the Clinician.
- On rare occasions (~1%) patients may develop orolingual angioedema post thrombolysis. This can be managed initially with nebulised **Adrenaline 5 mg in 5 mL**. If the patient deteriorates **IV Adrenaline** can be given (ALS: Under consult only). IM adrenaline should be avoided post thrombolysis due to bleeding risk.

Endovascular Clot Retrieval (ECR)

- ECR is an effective treatment to remove large vessel clots up to 24 hours from symptom onset.
- ECR eligibility may be informed by the **ACT-FAST assessment tool**
- It is a time critical treatment that may require urgent secondary transport to an ECR capable hospital following initial CT scan and treatment.
- The mode of transport required for ECR transport will be coordinated with the hospitals, ARV and the Clinician. On occasion the urgency of transport will dictate that ALS Crews may transport patients with a higher degree of criticality than usual.
Endotracheal intubation

- Intubation should be considered where there is difficulty maintaining adequate airway, oxygenation and ventilation.
- Post intubation: Target BP 120 - 140 mmHg

Hospital pre-notification

- Pre-notification details allow the hospital to generate the CT request prior to ambulance arrival and reduces time to CT and any subsequent treatment.
Flowchart

Suspected stroke or TIA

1. **Status**
   - Suspected stroke or TIA

2. **Assess**
   - Determine symptom onset time
   - Consider stroke mimics, if unable to exclude stroke treat as per this guideline
   - Consider co-morbidities
   - Perform MASS Assessment (if positive < 24 hours perform ACT-FAST Assessment)
   - Assess ECG for possible AF

3. **Status**
   - MASS Positive ≥ 12 hours and
   - ACT-FAST Negative or
   - Suspected TIA
     - **Non-urgent transport**
       - Transport to the closest thrombolytic stroke centre

4. **Status**
   - MASS Positive < 12 hours and
   - ACT-FAST Negative
     - **Non-ECR eligible stroke**
       - IV access: 18G in large vein with reflux valve
       - Transport urgently to nearest thrombolyzing stroke centre
       - Consider IV with MSU if within response area
       - Pre-notify hospital with clinical details, name, and DOB

5. **Status**
   - MASS Positive < 24 hours and
   - ACT-FAST Positive at time of loading
     - **Possible ECR eligible stroke**
       - IV access: 18G in large vein with reflux valve
       - Consider IV with MSU or transport urgently to ECR centre if transport time equivalent to a thrombolyzing stroke centre
       - **Rural**: Transport urgently to nearest VST centre. Pre-notify VST stroke physician via Clinician
       - Otherwise transport urgently to nearest thrombolyzing stroke centre
       - Pre-notify hospital with clinical details, name, and DOB

6. **MICA**
   - In all cases if airway concerns present consider ETT as per CPG A0302 Endotracheal Intubation
Flowchart – MASS Stroke Assessment

In the setting of a normal BGL, an abnormal finding in one or more of the following is positive for suspicion of stroke

<table>
<thead>
<tr>
<th></th>
<th>Instruction</th>
<th>Normal finding</th>
<th>Abnormal finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial droop</td>
<td>Pt to show teeth or smile</td>
<td>Both sides of the face move</td>
<td>One side of the face does not move as well as the other</td>
</tr>
<tr>
<td>Speech</td>
<td>Pt to repeat &quot;You can’t teach an old dog new tricks&quot;</td>
<td>Pt says the correct words with no slurring</td>
<td>Pt slurs words, says incorrect words or is unable to speak or understand</td>
</tr>
<tr>
<td>Hand grip</td>
<td>Pt to squeeze your fingers</td>
<td>Equal grip strength</td>
<td>Unilateral weakness</td>
</tr>
</tbody>
</table>
Flowchart – ACT-FAST Assessment for ECR eligibility

ACT-FAST Assessment

If any step is negative, patient is ACT-FAST Negative

- **ARM**
  - Position patient arms at 45°
  - Encourage patient to hold up
  - One arm only falls to stretch within 10 seconds
  - Or if unable One arm only witnessed not moving

- **RIGHT arm drifts / not moving**
- **LEFT arm drifts / not moving**
- **CHAT**
- **TAP**
  - Tap shoulder on left side and call patient's name
  - Both eyes obviously deviated away towards right side or otherwise abnormal response

Severe language deficit
Not just slurring
- Mute
- Gibberish
- Unable to follow simple commands e.g. making a list or opening mouth
NEED without translator: Use TAP test

Eligibility criteria
- Deficits are new or significantly worse
- Known onset of symptoms < 24 hours
- Living at home independently with at most minor assistance
- No evidence of stroke mimics
  - Patient is not comatose / near-comatose
  - No seizure preceding symptom onset
  - BGL > 2.8 mmol/L
  - No definitely known (& active) malignant brain cancer

**ACT-FAST Positive**
Related Resources

- Stroke Foundation Guidelines
- Stroke Clinical Network (SCV)
The purpose of this CPG is to provide paramedics with guidance in managing patients who are currently registered with a community palliative care service and call an ambulance due to new or escalating symptoms. These symptoms are likely to be nausea/vomiting, pain, agitation/anxiety or dyspnoea.

The intent of treatment is to provide relief from distressing symptoms, not the treatment of any underlying disease process. For example, SOB caused by pulmonary oedema should be treated with morphine, not GTN and diuretics.

This CPG applies **ONLY** to patients with advanced, incurable disease who are no longer receiving active treatment, are currently registered with a community palliative care service and express a wish to stay at home.

### Care Objectives

- Agitation in the palliative care patient may be due to a number of causes including pain, hypoxia, hypotension, sepsis, urinary retention and electrolyte imbalance.

- The mainstay of treatment is morphine administered subcutaneously in a dose that is likely to keep the patient comfortable until the community palliative care service can attend.

- *Midazolam* may be administered where agitation is not associated with pain, however, *Morphine* and *Midazolam* should not be administered to the same patient unless under the direction of the community palliative care service due to the risk of respiratory depression.

- When a community palliative care service is unavailable to advise paramedics on management, the dose of subcutaneous *Morphine* to be administered is calculated by using the AV CPG App to convert each of the patient’s regular opioid analgesics to a total equivalent daily dose of oral morphine. PRN medications are not included in this calculation.

- Where the total equivalent daily dose of oral morphine is < 50 mg, the patient should receive *Morphine 2.5 mg S/C as calculated by the AV CPG app*.

- Where the total equivalent daily dose of oral morphine is ≥ 50 mg, 20 % of that dose will be calculated and converted to an appropriate subcutaneous dose by the AV CPG app.

- It is not expected that paramedics perform any of these calculations manually. Where the AV CPG App is not available, paramedics should consult the Clinician for the appropriate dose.

- Calculated doses of *Morphine* > 10 mg should be discussed with the Clinician. The maximum subcutaneous dose of *Morphine* is 20 mg. Patients who do not respond to this dose should be transported to hospital for further management. If paramedics have concerns, they should consult with the Clinician.

- If the patient is unable to have *Morphine*, an equivalent dose of *Fentanyl* should be administered. For example:
  - *Morphine 2.5 mg = Fentanyl 25 mcg*
  - *Morphine 20 mg = Fentanyl 200 mcg*

- Where the patient has not followed their symptom management plan, paramedics may encourage the patient / carer to administer any medications recommended as part of that plan, prior to management under this guideline. Paramedics can only administer the patient’s own medications where the symptom management plan is clear and they are trained and experienced in the technique.
of administration.

- Paramedics should not use in situ subcutaneous access devices unless they are familiar with them, or have guidance from someone who does (e.g. trained family member). Pediatric palliative care services will provide instruction over the phone on how to access their patient's devices.

- If a pediatric palliative care patient is attended, the Victorian Pediatric Palliative Care Program at the Royal Children's Hospital **MUST** be consulted regarding treatment and/or transport decisions. If the family presents paramedics with a symptom management plan, consultation must still occur before the plan is implemented.

- The on-call palliative care consultant is available 24 hours a day via the RCH switchboard on 9345 5522.

- For a patient in the care of a community palliative care service, there may be no benefit in measuring vital signs. However, if you are able to contact the palliative care service, they may ask you to measure vital signs to aid their assessment.

- It is important that the patient's regular treatment team are aware of the care delivered by AV Paramedics. Communicate directly with the community palliative care service if possible.

- Medications administered **MUST** be documented on the AV Health Information Sheet which should be left with the patient / carers to pass onto the palliative care team.

**Flowchart**

- **Status**
  - Patient in the care of a community palliative care service
  - The patient has followed their symptom management plan without resolution of symptoms

- **Assess / Consider**
  - Nausea / vomiting or
  - Pain causing distress or
  - Mild agitation or
  - Dyspnea

- **Community Palliative Care service unavailable**
  - **Action**
    - Treat nausea/vomiting per CPG A0701 Nausea and vomiting
    - Treat distressing pain, mild agitation caused by pain, or dyspnea with an appropriate dose of Morphine calculated via the AV CPG App (max 20 mg) and administered subcutaneously
    - Treat mild agitation not caused by pain with Midazolam 2.5 mg S/C
    - If symptoms are controlled following treatment and the patient / carers request transport, non-emergency patient transport (in a suitable timeframe) may be appropriate

- **Community Palliative Care service available**
  - **Action**
    - Consult for management
    - Where available, two paramedics should confirm the details of any medications recommended by the community palliative care service
    - Assess Pt and treat as per appropriate guideline
    - This may include transport to an appropriate medical facility
Related Resources

Principles of Major Trauma

Care Objectives

- Identify and manage conditions that pose an immediate threat to the patient’s life
- Minimise the time from injury to definitive care
- Hypothermia, acidosis and coagulopathy increase mortality in trauma
- Pain management is a cornerstone of trauma care

General Notes

Multiple trauma related CPGs will frequently need to be considered together in a single case. The following care objectives and notes should be considered in the context of the complex patient with multiple competing priorities.

General Care

- Manage life threatening injuries as an immediate priority (hemorrhage, airway, chest, pelvis and spinal trauma).
- In potential major trauma, transport should occur as soon as possible. The target scene time for non-trapped major trauma patients is less than 20 minutes. Paramedics are explicitly authorised to begin moving the patient towards the next level of care once the most life-saving procedures are completed.
- RSI should be considered only if the time taken to safely complete the procedure is significantly shorter than the time to definitive care. Basic airway support and transport may be lifesaving.
- IV access, analgesia/splinting, fluid administration, and patient warming should be considered concurrently with rapid transport to definitive care.
- A strong suspicion of spinal injury should exist for the unconscious patient or the awake patient complaining of spinal pain and/or neurological symptoms.
- If patients with suspected internal bleeding are likely to be trapped for a prolonged period, request the delivery of blood products to the scene.
- Hypothermia is associated with mortality in trauma. All available warming methods should be employed.
- Effective analgesia improves outcomes in trauma. Splinting and analgesia are more effective when employed together.
- Early Sit-Reps for additional resources (e.g. AAV and EMU) and other emergency services are critical for optimizing trauma workflow.
- Early hospital notification and transport to the highest level of trauma care saves lives.

Related Resources

- Trauma Victoria - Major Trauma Guidelines and Education
Care Objectives

- Identify and control major haemorrhage.
- Ensure vital organ perfusion while minimising the development of coagulopathy, acidosis and hypothermia.
- Rapid transport to a facility capable of definitive haemorrhage control.

General Notes

- Minimising the volume of fluid administered may require accepting tachycardia and a degree of hypotension prior to definitive control of the haemorrhage.
- A BP can be difficult to ascertain accurately in critically ill patients. Patients with a BP < 70 mmHg will often present with absent radial pulses and decreased alertness. It may be appropriate to combine these assessments with the use of BP, especially where BP is thought to be inaccurate or cannot be taken.
- Where the patient is not alert but has a BP ≥ 70 mmHg / radial pulse present, consider other causes of altered conscious state (e.g. TBI, ETOH, OD, hypoglycaemia, dementia).
- If an adequate BP cannot be achieved or there are other signs of unacceptably poor perfusion or deterioration, consult for further management. Options include further fluid, the use of pressors and/or the delivery of blood products.

General Care

- Blood products are the preferred resuscitation fluid and, where possible, should be considered in preference to normal saline (e.g. interhospital transfer, HEMS).
- Always consider tension pneumothorax, particularly in the patient with chest injury with IPPV or persistent hypotension despite fluid therapy.
- Where the patient condition and presentation allow, expedite transport with concurrent management of pain (e.g. penetrating trauma, amputation). Where possible, DO NOT delay transport for IV therapy in haemorrhagic hypovolaemia, especially penetrating trauma.
- This guideline applies to patients with suspected ruptured AAA, massive GIT haemorrhage, and pregnant trauma patients.
- This guideline DOES NOT apply to patients with TBI, isolated SCI or PPH. Manage as per the relevant CPG.
- For APH associated with major trauma, consult with PIPER. For APH not associated with major trauma, manage as per CPG M0201 Antepartum Haemorrhage
Flowchart

Status
- Suspected hypovolemia from a haemorrhagic cause – GI, AAA, trauma

Stop
- Patients with TBI, isolated SCI, APH or PPH must NOT be treated using this CPG

Major haemorrhage

Prioritise control of major haemorrhage over all other interventions

Action
Mx potential mimics of hypovolaemia:
- TPT
- Significant pain (concurrent with Tx where required)
- Environmental exposure (heat, cold)

SBP ≥ 70 mmHg
Action
- Tolerate hypotension without fluid replacement for up to 2 hours
- Prepare for deterioration
- Consult with clinician or receiving hospital for Mx if:
  - Long prehospital times
  - Prolonged extrication
  - Elderly/frail patients

SBP < 70 mmHg
Action
Prioritise immediate transport

- Normal Saline 250 mL IV
  - Repeat 250 mL (max. 2000 mL) as required
  - Titrate to SBP ≥ 70 mmHg
- Consult for further Mx if inadequate response
- Consider the availability of blood products (e.g. AAV)
Care Objectives

- To identify and manage time critical chest injuries such as tension pneumothorax

General Notes

Flail segment / rib fractures

- Pain associated with rib fractures may lead to hypoventilation. In these instances, prioritise careful titration of analgesia.

TPT in the awake / spontaneously ventilating patient

- Patients with generic signs and symptoms of pneumothorax are not indicated for decompression. Paramedics should closely monitor the patient for deterioration.
- TPT is highly likely in the patient with generic symptoms of pneumothorax AND subsequent deterioration in respiratory status and/or conscious state. Decompression is indicated in these patients.
- Hypotension is a late sign in the spontaneously ventilating patient. MICA paramedics should not wait for a drop in BP prior to decompression.

TPT in the ventilated patient

- TPT in the ventilated patient is more likely to develop rapidly, with a sudden decrease in SpO₂ and BP.
- Chest injury patients receiving IPPV have a high risk of developing a TPT. Bilateral chest decompression is appropriate prior to managing decreased perfusion.
- Equal air entry is NOT an exclusion criterion for TPT.
- Cardiac arrest patients are at risk of developing chest injury during CPR.

General Care

Chest decompression

- Insertion site for cannula/intercostal catheter (SMART):
  - Second intercostal space
  - Mid - clavicular line (avoiding medial placement)
  - Above rib below (avoiding neurovascular bundle)
  - Right angles to chest
  - Towards body of vertebrae
- Insert an intercostal catheter, ARS device or long 14g cannula.
- If air escapes, or air and blood bubble through the cannula / intercostal catheter, or no air / blood detected, leave in situ and secure.
- If no air escapes but copious blood flows through the cannula / intercostal catheter then a major
haemothorax is present. Remove, then cover the insertion site.

- **If a 14g cannula is used initially, it should be replaced with an intercostal catheter (if available) as soon as practicable.**

- **Catheter troubleshooting:**
  - Patient may re-tension as lung inflates if catheter kinks off
  - Catheter may also clot off. Flush with sterile **Normal Saline**

### Local anaesthesia for GCS > 10

- **Prepare Lignocaine 50 mg in 5 mL (1%) in a 10 mL syringe and attach a 23g or 21g needle.**
- **Locate insertion site for intercostal catheter, clean site and insert needle into pleural space. Inject up to 5 mL Lignocaine 1% into the tissues as needle is slowly withdrawn.**
- **Proceed with chest decompression.**
- **The maximum anaesthetic dose of Lignocaine 1% (to avoid the onset of side effects) is 4 mg / kg. This is unlikely to be reached in adult patients if the recommended dose is used.**
Flowchart - Tension Pneumothorax

Status
- Chest trauma
- Ventilated patient
- Suspected spontaneous pneumothorax

Assess
- Criteria for simple vs tension pneumothorax

Simple pneumothorax
- Any of the following:
  - Unequal breath sounds in spontaneously ventilating Pt
  - SpO₂ <92% on room air
  - Subcutaneous emphysema

Action
- Ensure Mx as per Chest injuries – General
- Monitor closely for possible development of TPT

TPT
- Any of the following +/- signs of Simple pneumothorax:
  - Respiratory distress in the awake Pt
  - SpO₂ to < 92% despite O₂
  - Conscious state
  - Poor perfusion or ↑HR +/- ↓BP
  - ↑Peak inspiratory pressure (ventilator) / stiff bag
  - ↑EtCO₂
  - ↑JVP
  - Tracheal shift

Cardiac arrest imminent

Action
- GCS < 10 and BP < 70 mmHg:
  - Immediate chest decompression as per General care

Cardiac arrest NOT imminent

Action
- Monitor closely for deterioration
- Chest decompression
  - GCS > 10, infiltrate chest wall with up to 5 mL Lignocaine 1% local anaesthetic and decompress as per general care

Related Resources


Care Objectives

- To identify and appropriately triage potentially serious head injury.
- To optimize ventilation, oxygenation and cerebral perfusion pressure in order to prevent secondary brain injury.

General Notes

- The Trauma Time Critical Guidelines require patients with serious blunt trauma to a single region to be triaged to the highest level of care. When assessing pattern of injury, the patient can be considered to have a serious blunt head injury with or without loss of consciousness / amnesia and GCS 13 - 15 with any of:
  - any loss of consciousness exceeding 5 minutes
  - skull fracture (depressed, open or base of skull)
  - vomiting more than once
  - neurological deficit
  - seizure

- Elderly patients with standing height falls who meet no other time critical criteria but are on anti-coagulant, antiplatelet agents or have bleeding disorders should not be underestimated. Transport to an appropriate level of care.

- Intoxicated patients with apparently minor MOIs (e.g. standing height fall) are at high risk of occult clinically significant head injury.

General Care

- Midazolam should not be used to control combativeness prior to RSI in head injury. Judicious opioid pain relief should be administered.

- In the rare circumstance where combativeness is preventing preoxygenation, then all other preparations for the RSI should be undertaken and a small (20 – 40 mg) bolus of Ketamine may be given to enable preoxygenation.

- Where the patient is severely agitated, manage with ketamine as per CPG A0708 Agitation

- Dress open skull fractures / wounds with an appropriate dressing.

- Consider spinal immobilisation as per CPG A0804 Spinal injury. If intubation is required, apply cervical collar after intubation. Attempt to minimise jugular vein compression.

- Attempt to maintain normal body temperature.

- If an adequate blood pressure cannot be achieved or there are other signs of unacceptably poor perfusion or deterioration, consult for further management. Options include further fluid or the use of pressors.
Flowchart

**Status**
- Traumatic head injury

**Assess**
- Time critical head injury
- Other head injury
- Pupillary response

**Airway**
- If airway patent, do not insert NPA or OPA.
- If airway not patent, consider:
  - Airway position and mask seal if ventilating
  - Suction if required
  - NPA
- If GCS < 10, regardless of airway reflexes, intubate as per CPG A0302 Endotracheal Intubation - RSI
- If intubation is not possible / authorized and gag is absent insert SGA

**Ventilation**
- Ensure adequate ventilation and oxygenation:
  - \( V_i \ 6 - 7 \text{ mL/kg} \)
  - \( \text{SpO}_2 > 95\% \)
  - \( \text{EtCO}_2 \ 30 - 35 \text{ mmHg} \)
- Rx causes of hypoxia and avoid hypo / hypercarbia

**Perfusion**
- Normal Saline IV (max. 40 mL/kg) titrated to patient response (unless in the setting of penetrating truncal trauma or uncontrolled overt bleeding)
- Aim for SBP > 120 mmHg
- If SBP < 100 mmHg after 40 mL/kg:
  - Consult with appropriate trauma service
  - If consult is unavailable, Normal Saline 20 mL/kg IV

**General care**
- Rx sustained seizures as per CPG A0703 Seizures
- Rx hypoglycaemia as per CPG A0702 Hypoglycaemia
- Tx as per CPG A0105 Time Critical Guidelines (Trauma Triage) or to other appropriate facility
- Consider analgesia as per CPG A0501 Pain relief
Spinal Injury CPG A0804

Care Objectives

- To identify patients with suspected SCI and transfer them to the appropriate facility.
- To protect and support the integrity of the spinal column where SCI is suspected or unstable vertebral injury cannot be excluded.
- To avoid unnecessary immobilisation by clinically excluding patients without injury to the spinal column.

General Notes

- The intent of spinal immobilisation is to support the neutral alignment of the spinal column and reduce or distribute forces placed on it. A range of immobilisation techniques may be used to achieve this goal but are not a goal in themselves and should be modified where required by circumstance and comfort.
- Where a collar is not achieving the desired support and stability for any reason (e.g. the patient’s anatomy, agitation) it may be adjusted, loosened or removed if there are no other options (e.g. calming the patient).
- The optimum position for spinal immobilisation is supine. However, where this is not possible (e.g. pain, vertebral disease, kyphosis, injuries prevent the position, CCF), support the patient in a position of comfort.
- The CombiCarrier extrication board should only be used as an extrication device. Patients should NOT be immobilized on the board for transport to hospital.
- The head MUST NOT be independently restrained to the stretcher.

General Care

- Concerning MOIs include those with the potential for hyper-flexion, hyper-extension, hyper-rotation or axial loading of the spinal column.
- A significant amount of force is required to damage healthy vertebrae. Patients sustaining any dangerous mechanism of injury such as a car rollover/ejection, pedestrian impact, or diving accident should be treated and assessed carefully.
- Older patients, those with vertebral disease or previous spinal abnormalities (ankylosing spondylitis, spinal stenosis, spinal fusion, previous c-spine injury & rheumatoid arthritis) may sustain unstable injuries to the cervical spine from injuries involving far less force (e.g. standing height fall) and should be treated with a high index of suspicion after trauma of any kind.
- Patients with penetrating trauma should not be routinely immobilized. Consider immobilisation where there is a demonstrable neurological deficit.
- During extrication, all movements should be planned and co-ordinated as a team to minimise unnecessary handling of the patient and potential for manual handling injuries.
- Altered conscious state includes any presentation which may confound the results of a physical examination (e.g. GCS < 15 for any reason, concussion, dementia).
- Consider prophylactic antiemetic as per CPG A0701 Nausea and Vomiting in all awake spinally immobilised patients.
Spinal Injury CPG A0804

Flowchart

**Status**
- Any MOI or traumatic injury with the potential for to cause SCI

**Assess**
Does the patient have either:
- Major trauma criteria after blunt force trauma to the head or trunk
- Neurological deficit or changes

**Suspected SCI or Major trauma**
- Apply cervical collar
- Extricate on combi-carrier if necessary
- Immobilise on vacuum mattress or stretcher
- Tx without delay as per CPG A0105 Time Critical Guidelines (Trauma Triage)

**Assess modified NEXUS criteria**
**Increased injury risk**
- Age ≥ 65
- Hx of bone or muscle weakening disease/injury

**Difficult Pt assessment**
- Altered conscious state
- Intoxication
- Significant distracting injury

**Actual evidence of structural injury**
- Midline pain/tenderness on palpation of the vertebrae

**Neck range of motion**
- Patient is unable to actively rotate neck 45° left and right without pain

**Isolated spinal cord injury**
- If BP < 90 mmHg:
  - Normal saline 10 mL/kg IV

**Cervical spine NOT cleared**
- Any ONE of the above modified NEXUS criteria are present

**Action**
- Apply cervical collar
- Extricate on combi-carrier if necessary
- Consider self-extrication where the patient is:
  - Conscious and co-operative
  - Not intoxicated
  - Not prevented from doing so by injury
- Immobilise on vacuum mattress or stretcher

**Cervical spine cleared**
- NONE of the above modified NEXUS criteria are present

**Action**
- No spinal immobilisation required

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Spinal Injury - Neurological examination

### Neurological examination for the purpose of spinal clearance

Paramedics should assess the following criteria:

<table>
<thead>
<tr>
<th>Motor function - any weakness when asked to:</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Arms: Push, pull and grasp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Legs: Push / plantar flex, pull / dorsiflex and leg raise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensory function - reduced or no sensation when applying light touch to the following:</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Arms: Palms and back of hand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Legs: Lateral aspect of calcaneus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Suprasternal notch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient reports numbness, tingling, burning or any other altered sensation anywhere in the body.

If ANY of the above criteria are present, the patient should be considered to have neurological deficit and CANNOT be spinaly cleared.

- The left and right sides should be tested simultaneously in order to compare strength between sides of the body.
- Weakness or inability to perform the test due to pre-existing injury or anatomical considerations does not constitute a neurological deficit.
  - In these cases, sensory and motor function should be assessed against the patient’s normal ability.

### Related Resources

**Care Objectives**

- To identify and manage potential airway burns as a priority
- To minimise the impact of injury by maintaining tissue and organ perfusion, minimising pain, appropriate burn wound cooling and minimising heat loss during transfer to hospital.

**General Notes**

- Signs and symptoms of airway burns include:
  - Evidence of burns to upper torso, neck and face
  - Facial and upper airway oedema
  - Sooty sputum
  - Burns that occurred in an enclosed space
  - Singed facial hair (nasal hair, eyebrows, eyelashes, beards)
  - Respiratory distress (dyspnoea +/- wheeze and associated tachycardia, stridor)
  - Hypoxia (restlessness, irritability, cyanosis, decreased GCS)

- Patients who receive intubation and paralysis are at increased risk of hypothermia. Once a long term paralytic is administered, temperature management becomes a more significant priority.

- Volume replacement is calculated for the burn injury only. Manage other injuries accordingly including the requirement for additional fluid.

- Electrical burns are at increased risk of acute kidney injury secondary to profound muscle damage and may require extra fluid.

- If small, isolated, superficial burn with unbroken skin, or sunburn, consider Treat and Refer pathway as per [TR0205 Treat and Refer - Minor Burns](#)

**Transport Notes**

- All burns patients who meet the time critical trauma criteria (> 20% TBSA or >10% TBSA if age ≤ 15 years, suspected airway burns, > 1000 volt electrical burns) should be transported either to the Alfred Hospital or RCH (aged 12-15 yrs) as a preference, if within 45 minutes transport time. If transport time > 45 minutes, transport to the nearest alternative highest level of trauma service.

- Any burns involving the face, hands, feet, genitalia, major joints, or circumferential burns of the chest or limbs are recommended for assessment by a major burns service. These patients may not require direct transport to the Alfred Hospital if distance is prohibitive, as it may be by secondary transfer.

- In all cases of prolonged transport times, consider alternative air transport.

- In all cases of significant burn injury – whether due to % TBSA or location of injury – consider consultation with ARV for further management, appropriate destination and hospital notification.

**Burn cooling**

- Burn cooling should ideally be undertaken for 20 minutes. Stop cooling if the patient begins shivering or has a temperature ≤ 35°C. Cooling provided prior to AV arrival should be included in the timeframe.

- Cool with gentle running water between 5 – 15°C where available. Ice and iced water is not desirable.
Dirty (e.g. dam) water should be avoided due to contamination and risk of infection.

- If running water is not available, cooling may be achieved by immersing the injury in still water, using a spray bottle or applying moist towels.
- Whilst being mindful of temperature management, chemical burns should be irrigated for as long as pain persists. Avoid washing chemicals onto unaffected areas, especially eyes.
- Remove burnt clothing or clothing containing chemicals or hot liquid when safe to do so. Do not remove any matter that is adhered to underlying tissue. Remove jewellery prior to swelling occurring.

**Minimise heat loss**

- Maintaining normothermia is vital. Assess temperature as soon as practicable. Protect the patient from heat loss where possible.

**Elevate**

- If clinically appropriate, elevation of the affected area during transport will minimise swelling and oedema, especially in circumferential burns.

**Dressing**

- Cling wrap is an appropriate burns dressing and is preferred for all burns. It should be applied longitudinally to allow for swelling.

**Wallace rule of nines**

- Wallace rule of nines assists in estimating the % of total body surface area for burns patients. The breakdown is:
  - Head 9 %
  - Torso 18 % front (abdomen and chest) and 18 % back
  - Arm 9 % in total circumference (each)
  - Leg 18 % in total circumference (each)
  - Groin 1 %
Flowchart

**Status**
- Evidence of burn injury

**Stop**
- Paramedic safety is paramount
  - Ensure safety and removal from burn mechanism
  - Avoid chemical contamination

**Assess mechanism of burn and burn injury**
- Signs/symptoms of airway burns
- Mechanism of injury
- Severity of injury (%TBSA, estimated depth, other injuries, comorbidities)

**Suspected airway burns**

**Action**
For patients at any GCS:
- Consider ETT as per CPG A0302 Endotracheal Intubation
  - Consult with Alfred Hospital if GCS ≥ 10
  - Use RSI method unless contraindicated

**Partial or full thickness burns**

**Action**
- Patients > 15 years with TBSA >15%
  - Normal Saline - % TBSA x Pt wt (kg) = vol (mL) administered over 2 hours from time of the burn
- If Pt 12 – 15 years with TBSA >10%
  - Normal Saline IV fluid replacement: 3 x %TBSA x Pt weight (kg) = vol fluid (mL)
    - Given over 24 hours from time of burn
    - Administer half of the 24 hour fluid volume over the first 8 hours

**All burns**

**Action**
- Rx pain as per CPG A0501 Pain Relief
- Cool the burn
- Warm the patient
- Apply appropriate dressing
- Tx to an appropriate facility

If resources allow manage concurrently
The principles of good prehospital management of fracture/dislocation are:

- Control external haemorrhage
- Apply good splinting practices
- Resolve neurological or vascular compromise where possible
- Use judicious analgesia
Pelvic splints are a haemorrhage control device. If there is suspicion of a pelvic injury, a pelvic splint should be applied as a priority.

If a patient has inadequate perfusion and/or an altered conscious state following a mechanism that may result in pelvic injury, a pelvic splint should be applied as a priority.

If there is suspicion of both pelvic and leg injury, pelvic splinting and the CT-6 traction splint can be applied, but the pelvic splint is the priority and should be applied first.

Patients with suspected pelvic injury should not be log-rolled as it may mobilise the pelvis and disrupt clots.

General Care

Altered sensation, loss of a pulse or cold/dusky skin in a limb distal to a fracture or dislocation are indicators of neurological or vascular compromise, which constitutes a limb threatening injury and is time critical.

Fractures with neurological or vascular compromise should be realigned as soon as possible. In general, dislocations with neurological or vascular compromise should be urgently transported if within 15 minutes transport time of a higher level of care. Where travel times exceed 15 minutes, consult with receiving hospital and consider dislocation relocation at scene.

When considering relocating/reducing a fracture or dislocation, clinical judgement needs to be applied in relation to the risks associated with:

- Analgising the patient
- Likelihood of success of the procedure

The general principles of reducing a fracture are:

- Provide procedural analgesia as per CPG A0501 Pain Relief
- Irrigate with 500 mL – 1 L of N/Saline prior to reduction if the fracture is compound.
- Apply traction and gentle counter-traction in the line of the limb. This should reduce most fractures.
- If required, further manipulation should be done whilst the limb is still under traction.
- Splint the limb following reduction

The general principles of relocating a dislocation are:

- Provide procedural analgesia as per CPG A0501 Pain Relief
- Apply sustained traction in the longitudinal direction away from the joint
- Have an assistant providing counter-traction above the site of injury

After reducing a fracture ongoing analgesia is likely to be required, as the pain will persist beyond the fracture being reduced and splinted. Opioids are indicated for most fractures.
Flowchart

**Status**
- Patient with suspected fracture or dislocation

**Stop**
- Prioritise pelvic splinting if either:
  - Suspected pelvic fracture, or
  - Inadequate perfusion or altered conscious state, secondary to mechanism which may result in pelvic injury

**Assess**
- If the chest is injured and rib fractures are suspected

**Action**
- Treat as per A0802 Chest Injuries

**Assess**
- If a limb is injured, assess for neurological or vascular compromise distal to the injury

**Action**
- In the setting of a fracture with neurological or vascular compromise distal to the injury, treat Pt pain as per CPG A0501 Pain Relief and reduce the fracture as per General Care notes
  - Apply appropriate splinting once fractures are reduced
  - If a joint is dislocated with neurological or vascular compromise distal to the joint consider immediate transport with notification and consult with an MTS via the Clinician to receive advice around relocation
  - Some dislocations (e.g. hip) can be extremely painful and will require aggressive analgesia which may include ketamine
  - Reassess neurovascular status following any manipulation/splinting/sling application
Related Resources


**Care Objectives**

- Supine or lateral positioning
- High-flow oxygen
- IV rehydration
- Transport to a hyperbaric facility

**General Notes**

**Intended patient group**

- This CPG applies to patients who are experiencing possible symptoms of Decompression Illness (DCI) following a SCUBA dive.
- **Major Trauma:** In the setting of concurrent major trauma, the patient should be managed according to [CPG A0800 Principles of Major Trauma](#) with priority given to managing life threatening injuries before considering specific management as per this CPG

**Decompression Illness (DCI)**

Decompression Illness occurs when gas emboli form in blood and/or tissues following a rapid decrease in environmental pressure as can occur during SCUBA dive resurfacing.

This is a result of gases (mainly nitrogen) absorbed into the tissues on descent being released and forming bubbles in the bloodstream or pulmonary barotrauma.

**Signs and symptoms**

- Neurological changes (other than those listed under CAGE)
- Respiratory complaints
- Musculoskeletal pain
- Itching and/or blotchy rash

**Cerebral Arterial Gas Embolism (CAGE)**

In severe cases emboli may form in or travel to cerebral arterial circulation where they may cause temporary or permanent neurological dysfunction.

**Signs and symptoms**

- **Neurological:** GCS < 15 at any point, any seizure, any LOC (even if asymptomatic when assessed by AV)
- Onset of symptoms soon after surfacing (no specific timeframe, consider approximately half an hour)

**Specific History**

- Specific history is important for the receiving hospital and should be obtained at the scene where possible:
Management

Supine or lateral positioning
- Reduces the effect of gravity on the mobility of gas emboli

High-flow oxygen
- Oxygen must be delivered in the highest concentration possible to promote nitrogen off-gassing. This will likely be 15 LPM via non-rebreather mask or BVM

IV rehydration
- Dehydration occurs frequently in diving. Rehydration of patients complements hyperbaric management in hospital.
- Recompression reduces the size of inert gas emboli and increases the partial pressure of oxygen delivered to the patient.
- It is no longer considered necessary to withhold opioid analgesia if the patient is in pain. Treat as per CPG A0501 Pain Relief.
- Manage hypothermia as per CPG A0901 Hypothermia.

Non-recent dive (> 12 hours)
- Patients with a GCS of 15 who have been suffering symptoms for > 12 hours before calling can be kept on simple face mask, but still require transport to a recompression facility with their equipment.
- If cardiovascular or neurological symptoms are present, patient remains time-critical.

Transport
- **Dive computers:** It is essential that any dive computers and gauges be transported to the recompression facility
- **Destination:** The only public recompression facility in Victoria is at the Alfred Hospital. There is also a facility at the Royal Adelaide Hospital
- **Air transport:** Helicopter transport at < 300 m (approx. 900 feet) altitude or pressurised fixed wing aircraft are the preferred options
- **Consultation:** Early consultation with the on-call hyperbaric physician at The Alfred Hospital can assist with paramedic decision making and provide early notification of hospital based services. Paramedics should have a low threshold for contacting The Alfred Hospital to discuss patient management. This can be done via the Clinician.
**Flowchart**

- **Status**
  - Recent SCUBA dive

- **Assess**
  - Possible Decompression Illness (DCI)
  - Possible Cerebral Arterial Gas Embolism (CAGE)
  - Pneumothorax as per CPG A0802 Chest Injuries
  - Neurological examination as per CPG A0804 Spinal Injury
  - Specific History

- **Stop**
  - Onset of symptoms soon after surfacing, or any cardiovascular or neurological compromise confer time criticality.
  - Consider AAV support early and rapidly transport the patient to a recompression facility

- **All Decompression Illnesses**

  - **Action**
    - Position supine or lateral
    - If conscious, administer **Oxygen 15 L/min** via non-rebreather mask regardless of SpO2. If altered consciousness support the patient’s ventilations with BVM and **Oxygen 15 L/min**
    - If chest is clear **Normal Saline IV 1000 mL over 15 – 20 minutes**, repeated **every 4 hours**.
    - Consider ETT as per CPG A0302 Endotracheal Intubation
The purpose of this CPG is to provide Paramedics with guidance when managing an elderly or frail patient who has fallen but has no apparent injury.

The cause of a fall can be broadly placed into one of three categories:

- Environmental/mechanical – e.g. events related to uneven ground, poor lighting, ill-suited footwear
- Known medical/pharmacological factor – e.g. postural hypotension, poor gait, confused patient or change of medication
- Unanticipated event – e.g. AMI or seizure

The first category is preventable. The second one may be preventable. The third category is not. Classifying the fall can aid in gauging the risk of whether a patient might fall again.

Key factors when assessing the falls risk of a patient include:

- Sensory impairment
- Medications – recent changes to their medication regimen, multiple medications or specifically being on cardiovascular medications
- Mobility issues or uses mobility aids
- Altered cognitive state
- Continence issues
- Environment is unsafe – stairs, rugs, wires, poor footwear
- A history of falls
- Depression

General Care

- A fall is any event where a person comes to rest inadvertently on the ground, floor or other lower level.

- Elderly patients are usually considered > 65 years of age. Consideration should also be given to a patient < 65 years of age in relation to their frailty status, comorbidities or baseline level of functioning.

- Any fall that occurs whilst a patient is in AV care MUST be reported via Riskman.

- Patients who are at risk of falls should be referred for further assistance. As an initial point of contact a GP is appropriate. When possible, the GP should be contacted and spoken to directly by Paramedics.

- For patients who require medical follow-up, reasons to preferentially transport to hospital rather than connect with the GP include if the patient is socially isolated or if the patient is geographically remote.

- There is no specific timeframe that constitutes a safe or unsafe period, but patients who have fallen and spent a long time on the ground should be carefully assessed (aside from their injuries) for complications such as dehydration or pressure sores.
Flowchart

**Status**
- Elderly or frail patient who has called 911 due to a fall

**Stop**
- If patient has suffered an injury, do not progress through this guideline. Treat as per appropriate guideline.
- There should be a very low threshold to transport a patient who falls and lies on anti-coagulants. If there is a head-strike, the patient should be transported.

**Assess**
- Does the patient have a full recollection of how the fall occurred?
- Is the fall likely due to a mechanical/environmental issue that can be resolved?
- Was the patient able to get up without assistance or call for help relatively quickly?
- Considering the key factors when assessing a falls patient, are they considered low risk to have a subsequent fall?

**Action**
- Contact Pt's GP for appointment to discuss Falls Assessment
  OR
- With Pt's consent, contact family member or friend to support Pt. Outline the risk of subsequent falls with the potential for serious injuries and encourage follow up with the GP

**Action**
- Pt requires medical follow-up:
  - Strongly recommend to Pt that they accept transport to appropriate and/or nearest available hospital. If within a reasonable timeframe, a non-emergency ambulance may be appropriate.
  - If patient refuses transport:
    - Contact Pt's GP for appointment to discuss Falls Assessment
    AND
    - Request Pt's consent to contact family member or friend to support Pt
Care Objectives

- To identify and appropriately manage hypothermic patients
- To minimise the risk of major trauma patients becoming hypothermic

Intended patient group

- All adult patients

Classification

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>32 – 35°C</td>
</tr>
<tr>
<td>Moderate</td>
<td>28 – 32°C</td>
</tr>
<tr>
<td>Severe</td>
<td>&lt; 28°C</td>
</tr>
</tbody>
</table>

Assessment

- Hypothermia is insidious and rarely occurs in isolation if the patient is part of a group.
- Elderly patients are a particular risk group for suffering hypothermia and this should be considered when assessing them, irrespective of the initial complaint.
- Potential major trauma patients should receive thermal management under this guideline, irrespective of their temperature.

Cardiac arrhythmias

- Associated with temperatures < 33°C.
- Gentle handling of the patient is essential to avoid stimulating lethal arrhythmias.
- Atrial arrhythmias, bradycardias or A-V blocks will generally resolve on rewarming. Antiarrhythmic medications or trans-thoracic pacing are usually not required unless decompensation has occurred.
- Defibrillation and cardioactive medications may not be effective at temperatures < 30°C. VF may resolve spontaneously upon rewarming.

Management

All patients

- The target temperature for the patient compartment of the ambulance for patients suffering or at risk of hypothermia is 24°C or higher.
- If a patient has wet clothes on they must be removed, the patient dried and then thermally protected. If a patient has dry clothes on, they should only be removed if required to assess and treat injuries.
- Where IV fluid is indicated it should be delivered via a fluid warmer if available.
- Bags of IV fluid are not to be warmed in a microwave and either administered to a patient, or used as
a hot water bottle.

Cardiac arrest

- The onset and duration of medications is prolonged during hypothermia. In cardiac arrest if the patient has a temperature < 30°C, the interval between doses of adrenaline or amiodarone is doubled as per CPG A0201 Cardiac Arrest.

Intubation

- Intubated hypothermic patients should have their temperature monitored with an oesophageal temperature probe where available.
- Intubated patients who are sedated and paralysed are at risk of becoming hypothermic and should have thermal management initiated once stabilised.
Flowchart

**Status**
- Hypothermia or
- Potential major trauma

**Assess**
- Perfusion status
- BGL if altered conscious state

**Hypothermia < 35°C**

- **Action**
  - Protect the patient from heat loss using all available options including:
    - Ensure ambulance heater remains on and the rear of the vehicle closed as much as possible
    - Remove wet clothing and dry the patient
    - Cover the patient above and below with a thermal wrap (sheet/space blanket/standard blanket) or if available, an active warming blanket device
  - Intubation needs to be approached with caution in severe hypothermia, due to the risk of stimulating a lethal arrhythmia
  - If GCS < 10 consider ETT as per CPG A0302 Endotracheal Intubation

**Potential Major Trauma regardless of T°**

- **Action**
  - Manage the patient as per relevant CPGs, whilst concurrently protecting the patient from heat loss using all available options including:
    - Ensure ambulance heater remains on and the rear of the vehicle closed as much as possible
    - Minimise scene time as per CPG A0800 Principles of Major Trauma
    - Remove wet clothing and dry the patient
    - Cover the patient above and below with a thermal wrap (sheet/space blanket/standard blanket) or if available, an active warming blanket device
  - If patient is a high risk trauma patient (Temp < 35°C or intubated or haemorrhagic shock), all of the above measures are an urgent priority and MUST be implemented as soon as possible, concurrently with other management
To identify and appropriately manage hyperthermic patients with an urgency relative to their presentation.

The focus of treatment must be on aggressive cooling.

Intended patient group

- The cause of heat illness may be:
  - Environmental
  - Exertional
  - Chemically mediated

- Heat stroke is generally defined as a temperature > 40°C with associated CNS dysfunction and is an urgent medical emergency.

- There may be some patients who have cross-over between environmental / exertional and toxin induced heat illness. Irrespective of whether the cause is clear, the focus of management is aggressive cooling.

- If a patient presents with signs / symptoms of heat stroke in a context where it is the likely diagnosis, and other causes of CNS dysfunction are ruled out, they should be actively and aggressively cooled. It is expected that the temperature will be >38°C, but the exact number should not be the defining factor when deciding to treat or not.

- Exertional heat illness may affect patients in groups. If presented with a group suffering heat illness, consider requesting further resources such as ice and bottled water be brought to the scene to facilitate cooling and rehydration of multiple patients.

Management

Position

Gentle handling of the patient is essential. Position flat or lateral and avoid head-up positioning as far as possible to avoid hypotension, collapse and possible arrhythmias.

Cooling techniques

Strip / spray / fan

Air flow over the wet skin must be vigorously promoted. Passively blowing air conditioning is not adequate – aggressive fanning is required.

Oral fluids

If the patient is able, cold oral fluids are a suitable method of rehydration.

IV fluids

Cold IV fluid administration is to be titrated to adequate perfusion and consideration of temperature.

Consider a slower rate of fluid administration for the elderly or patients with impaired renal or cardiac function.
**Ice bath / cold shower**
In some sporting environments access to ice baths and/or open shower facilities may facilitate effective rapid cooling for exertional hyperthermia patients. Consider using these techniques where these facilities and resources are readily accessible while preparing for transport.

Some music festivals will also have ice baths on scene for toxin induced hyperthermia patients. In this circumstance it is possible that the patient will be intubated and placed in the bath prior to AV arrival. If definitive transport is going to be delayed (e.g. awaiting HEMS) consider leaving the patient in the ice bath until ready to move.

**Muscle paralysis (RSI)**
In toxin induced hyperthermia, standard cooling techniques in isolation are less likely to be effective as the intrinsic cause has not been fully addressed. In more severe cases, neuromuscular paralysis may assist and accordingly, RSI may be appropriate.

**Target temperature**
Aim for a target patient temperature < 40°C within 30 minutes of onset of symptoms if possible.

**Intubated hyperthermic patients**
Monitor temperature with an oesophageal temperature probe where available.

**Risk Factors**

**Elderly / frail patients**
Frail patients are at increased risk of environmental hyperthermia, particularly during heat wave conditions. There should be a low threshold for transport, even if it is purely so they can be monitored in an air conditioned environment.

Age ≥ 65 years is an independent factor which increases the risk of hospital / ICU admission and death if a patient presents with a heat illness.

**Toxin induced hyperthermia**
Maintain a lower threshold to manage agitation with early sedation to prevent further increases in temperature, as per CPG A0707 Overdose: Sedative Agents/Psychostimulants.
Other assessments
- BGL if altered conscious state
- Perfusion and hydration status

Environmental / Exertional
- Athletic training / playing in hot conditions
- Manual labour, working in heavy clothing (e.g., firefighting)
- Elderly / frail patient in a hot environment (e.g., hot room, sauna, direct sunlight)

- Elderly / frail patient
  - Cooling techniques
  - Cold Normal Saline IV (max. 20 mL/kg)
    - Reassess after each 500 mL increment

- Young / fit / healthy patient
  - Consider immediate ice bath or cold shower if facilities and resources allow while preparing for transport, otherwise.
  - Cooling techniques
  - Cold Normal Saline IV (max. 40 mL/kg)

- Consider intubation as per CPG A0302 Endotracheal Intubation if required to facilitate cooling

Toxin induced
- Psychostimulants
- Anticholinergics
- Phenothiazines
- Serotonergics

- All patients
  - Consider early request for MICA
  - Cooling techniques
  - Early transport – cooling methods in isolation are less likely to be effective
  - Cold Normal Saline IV 20 mL/kg (max. 40 mL/kg)
  - Treat agitation early as per CPG A0708 Agitation if required to facilitate cooling

- Consider early intubation (consult) as per CPG A0302 Endotracheal Intubation

Cooling techniques
- Remove Pt from hot environment
- Strip / spray / fan (aggressive fanning)
- Junctional ice packs
Care Objectives

- Patient history alone is enough to suspect envenomation
- Effective PBI if required – limit patient movement (bandage and splint)
- Transport patient urgently to appropriate destination – consider consulting with ARV/PIPER

General Notes

Intended patient group

- All adult and paediatric patients

Signs of systemic snake envenomation

- Eyelid dropping, diplopia, slurred speech, drooling, generalised muscle weakness (typical of tiger snake envenomation)
- Pain: generalised muscle pain, pain in lymph nodes draining the bite area, headache, abdominal pain (typical of tiger snake envenomation)
- Nausea or vomiting, sweating
- Respiratory distress (late sign)
- Loss of consciousness, paralysis
- Bleeding: bleeding from the bite site or elsewhere, bleeding from nose, gums, passing dark or red urine.

Pressure bandage with immobilisation (PBI)

- Pressure bandage application should be as tight as that for a sprained ankle
- Ensure bandaging does not cause loss of peripheral pulses.
- Use 15cm broad elasticated roller bandage

Blue ringed octopus

- Consider prolonged respiratory resuscitation. Due to paralysis patients will suffer respiratory arrest prior to cardiac arrest as a result of hypoxia. With appropriate ventilatory support the prognosis is good, even in cases of severe envenomation.

Tick bite

- May cause anaphylaxis early (manage as per CPG A0704 / P0704 Anaphylaxis) or a slow developing paralysis over days.
- Do not attempt to remove a tick if encountered. They require careful removal to ensure that the head does not remain embedded.

Management
Envenomation

- Contact ARV / PIPER via Clinician for management advice.
- In the case of a patient who is symptomatic after a suspected or confirmed snake bite, if transport time > 30 minutes to ED consult early with ARV to facilitate transport of the patient to an appropriate destination for anti-venom.
- Caring for the patients in the hours following envenomation (e.g. including inter-hospital transfer care) will include monitoring for signs of coagulopathy (bleeding from bite site or cannulae) and renal impairment. This may include measuring urine output where possible.

Paediatrics

- Envenomation should be considered when faced with a paediatric patient with sudden unexplained illness
- Children are at high risk due to venom / body weight ratios.

Antivenom

- Once approved by ARV / PIPER, you may be required to initiate snake antivenom. Follow administration advice from ARV / PIPER which may include the following:
  - Maintain first aid including PBI
  - Closely monitor vital signs
  - IV access x 2 is optimal. Connect IV fluid (TKVO or OFF) and prepare IV Adrenaline in case of anaphylaxis response to antivenom
  - Draw up the antivenom recommended by the toxicologist (via ARV / PIPER) and add it into a new bag of Sodium Chloride 0.9% 500 mL
  - Administer the full 500 mL via a separate IV giving set over 20-30 mins
  - There is a risk of anaphylaxis following antivenom administration. If detected, stop the infusion and provide treatment as per CPG A0704 / P0704 Anaphylaxis. Contact ARV / PIPER to discuss ongoing patient care
Flowchart

**Status**
- Suspected envenomation or
- History suggestive of potential envenomation

**Stop**
- Do not attempt to capture any potentially venomous creature
- Assess PBI. Leave in situ if appropriately firm. Reapply if too loose or restricting circulation

**Assess**
- Type of envenomation
- For suspected snake bite with transport time > 30 minutes to ED, consult early with ARV / RIPER

**General Care**
- Manage airway, ventilation and perfusion as required
- Manage pain as per CPG A0501 Pain Relief
- Manage nausea/vomiting as per CPG A0701 Nausea and Vomiting
- Manage seizures as per CPG A0703 Seizures

---

**All Australian snakes**
- Do not walk the patient

**Limit mobility to restrict venom movement**
- Bite to a limb
  - Apply PBI
  - Splint limb
  - Immobilise the patient on the stretcher
- Bite to the torso
  - Immobilise the patient on the stretcher
- Obtain IV access >2 if possible
- Manage respiratory distress with supplemental O2 and supportive ventilation as required

**Spiders**

- **Red back spiders**
  - No PBI
  - Apply ice pack to the site
- **Big black spiders**
  - Do not walk the patient. Limit mobility to restrict venom movement
  - For a bite to a limb, apply PBI and immobilise the patient on the stretcher
  - For a bite to the torso, immobilise the patient on the stretcher
- Manage pulmonary oedema with CRAP
- Manage excessive secretions with *Atropine 600mcg IV / IM once only*

**Marine animals**

- **Non-tropical jellyfish (incl. bluebottle)**
  - Wash affected area with sea water if possible
  - Gently pick off remaining tentacles
  - Apply warm/hot water to the site if available. Consider ice pack to the site if not. Do not apply vinegar
- **Barbed fish / rays**
  - Do not attempt to remove the barb
  - Manage haemorrhage as required
  - Immense in warm/hot water if available
- **Blue ringed octopus**
  - For a bite to a limb, apply PBI and immobilise the patient on the stretcher
  - For a bite to the torso, immobilise the patient on the stretcher
  - Prepare for patient deterioration
  - Prolonged resuscitation efforts should be considered
A paediatric patient is defined as any patient with an age < 12 years (i.e. up to and including 11 years), for the purpose of assessment and management under these guidelines.

Care Objectives

Care Objectives

Paediatric drug doses are calculated by weight to adjust for anatomical and physiological changes in a developing child. In older children, the calculated dose of some drugs may correctly exceed the adult dose.

For specific management of the newborn, refer to appropriate newborn guidelines.

Caregiver level of concern is a valid symptom when assessing a child and it should not be discounted. Consider asking how the child is different from normal and whether the caregiver feels they are getting better or worse since calling AV.

Assessment should consider the clinical trajectory of the child – at which point in their illness or injury are Paramedics encountering them? Are they likely to improve or deteriorate from this point?

Children generally suffer cardiac arrest following a period of circulatory or respiratory insufficiency. If these conditions are recognised and treated promptly, cardiac arrest may be avoided.

The RCH will accept any patient up to and including the age of 15 years and is the destination of choice for trauma and burns in this age range. If the patient has a relevant past history at RCH, they will accept patients up to and including the age of 18 years.

If the management recommended in these guidelines is not successful or if further guidance is required, consultation with the RCH (or intended destination hospital) should be undertaken via the Clinician.

Paediatric Infant Perinatal Emergency Retrieval (PIPER – formerly NETS, PETS and PERS) can also be accessed via the Clinician or on 1300 137 650 for clinical advice or support.

Children presenting with abnormal vital signs must be transported to hospital.

Rarely, paediatric patients may present with stroke, pain insufficiently managed by a palliative care program or agitation requiring sedation. The following adult CPGs contain information relevant to these patients and may be applied to paediatric patients following appropriate consultation:

- CPG A0708 Agitation
- CPG A0711 Stroke / TIA
- CPG A0712 Palliative Care

Paediatric Assessment Triangle

Paediatric Assessment Triangle

The Paediatric Assessment Triangle provides an accurate method for a simple “first impression” assessment to guide urgency of care, particularly for non-verbal children. It can be conducted rapidly and without equipment. If the patient exhibits abnormal findings then proceed immediately to the primary survey.

Look at and listen to the child to rapidly estimate their level of criticality. This assessment should take no more than a few seconds.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Well child</th>
<th>Unwell child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tone</td>
<td>Active, reaching, moving, strong grip</td>
<td>Still, floppy, quiet</td>
</tr>
<tr>
<td>Interactivity</td>
<td>Interested in the environment, looking, smiling</td>
<td>Not interested in their surroundings</td>
</tr>
<tr>
<td>Consolability</td>
<td>Easily comforted/consoled</td>
<td>Inconsolable</td>
</tr>
<tr>
<td>Look/gaze</td>
<td>Looks at caregivers or items of interest</td>
<td>Staring, not engaging in eye contact</td>
</tr>
<tr>
<td>Speech/cry</td>
<td>Cries</td>
<td>Moaning, grunting or quiet</td>
</tr>
</tbody>
</table>

Adapted from “Detect Junior: The Paediatric Approach”, Clinical Excellence Commission NSW, 2012
Related Resources

- Paediatric Clinical Network (SCV)
### Paediatric Definitions

<table>
<thead>
<tr>
<th>Nomenclature</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>Birth to 24 hours</td>
</tr>
<tr>
<td>Small infant</td>
<td>Under 3 months</td>
</tr>
<tr>
<td>Large infant</td>
<td>3 - 12 months</td>
</tr>
<tr>
<td>Small child</td>
<td>1 - 4 years</td>
</tr>
<tr>
<td>Medium child</td>
<td>5 - 11 years</td>
</tr>
</tbody>
</table>

### Paediatric Weight Calculation

For children various treatments are based on body weight, such as drug doses, defibrillation joules and fluid volume. It is acceptable to ask a parent the patient’s weight. If weight is unknown, it can be estimated using the following guide.

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 24 hours</td>
<td>3.5kg</td>
</tr>
<tr>
<td>3 months</td>
<td>6 kg</td>
</tr>
<tr>
<td>6 months</td>
<td>8 kg</td>
</tr>
<tr>
<td>1 year</td>
<td>10 kg</td>
</tr>
<tr>
<td>1 - 9 years</td>
<td>Age x 2 + 8 kg</td>
</tr>
<tr>
<td>10 - 11 years</td>
<td>Age x 3.3 kg</td>
</tr>
</tbody>
</table>
Normal Values

Normal blood volume

Newborn - 80 mL/kg

Infant and child - 70 mL/kg

### Adequate perfusion

<table>
<thead>
<tr>
<th>Age</th>
<th>HR</th>
<th>BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn (&lt;24 hrs)</td>
<td>110 - 170 bpm</td>
<td>&gt;60 mmHg</td>
</tr>
<tr>
<td>Small infant (&lt;3 mth)</td>
<td>110 - 170 bpm</td>
<td>&gt;60 mmHg</td>
</tr>
<tr>
<td>Large infant (3-12 mth)</td>
<td>105 - 165 bpm</td>
<td>&gt;65 mmHg</td>
</tr>
<tr>
<td>Small child (1-4 yrs)</td>
<td>85 - 150 bpm</td>
<td>&gt;70 mmHg</td>
</tr>
<tr>
<td>Medium child (5-11 yrs)</td>
<td>70 - 135 bpm</td>
<td>&gt;80 mmHg</td>
</tr>
</tbody>
</table>

Skin - warm, pink, dry

Conscious state - alert and active

### Inadequate perfusion

Any deviation from normal perfusion values is a source of concern. Children presenting with abnormal vital signs must be transported to hospital.

**Skin** – cool, pale, clammy.

In the setting of an unwell child, cold hands/feet and mottled skin are an early sign that correlates with subsequent ICU admission. This should always be treated as a significant finding.

**Conscious state** – patient responding to voice, pain or unresponsive. May present as restless / agitated.

For Abnormal Trauma Values see CPG P0105.

The inadequate perfusion vital signs are based on hospital data for unwell children. They reflect the vital signs used by RCH to trigger a medical review for a paediatric inpatient. They can be modified based on clinical context. The clinical trend for the patient is as important as the threshold limits and a patient who is moving through the adequate range towards inadequate perfusion should trigger attention prior to crossing the threshold. Key reference: [http://www.rch.org.au/clinicalguide/guideline_index/Normal_Ranges_for_Physiological_Variables/](http://www.rch.org.au/clinicalguide/guideline_index/Normal_Ranges_for_Physiological_Variables/)
General Notes

• If patients are not producing tidal volumes necessary to allow auscultation, consider other aspects of the patient presentation. Indicators of increased work of breathing such as chest wall retraction and use of accessory muscles should raise the level of clinical concern. In general, there should be an inverse correlation between the degree of air entry and the work of breathing (↓ air entry = ↑ WOB).

• Below 2 years of age, respiratory distress associated with a wheeze is unlikely to be asthma due to the still developing smooth muscle in the airways. Salbutamol may not be of benefit to these patients. Oxygen (unless driving a nebuliser) should only be applied if patient is hypoxaemic.

• The respiratory rates below are based on hospital data for unwell children. They reflect the vital signs used by RCH to trigger a medical review for a paediatric inpatient. They can be modified based on clinical context. The clinical trend for the patient is as important as the threshold limits and a patient who is moving through the normal range towards respiratory distress should trigger attention prior to crossing the threshold.

Key reference: http://www.rch.org.au/clinicalguide/guideline_index/Normal_Ranges_for_Physiological_Variables/

Normal Values

Normal respiratory rates

<table>
<thead>
<tr>
<th>Age</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>25 - 60 breaths/minute</td>
</tr>
<tr>
<td>Small infant</td>
<td>25 - 60 breaths/minute</td>
</tr>
<tr>
<td>Large infant</td>
<td>25 - 55 breaths/minute</td>
</tr>
<tr>
<td>Small child</td>
<td>20 - 40 breaths/minute</td>
</tr>
<tr>
<td>Medium child</td>
<td>16 - 34 breaths/minute</td>
</tr>
</tbody>
</table>
Abnormal Medical Values

Respiratory distress

Any deviation from normal respiratory values is a source of concern. Children presenting with abnormal vital signs must be transported to hospital.

Signs of respiratory distress include:

- tachypnoea
- chest wall retraction
- use of accessory muscles
- tracheal tugging
- abdominal protrusion.

For Abnormal Trauma Values see CPG P0105.
AVPU (Alert, Voice, Pain, Unresponsive)

- AVPU is the preferred tool for assessing conscious state in children where adapting the GCS can be problematic. It is widely used and is consistent with current practice at RCH.
- AVPU is quick and simple to apply and is appropriate to determine conscious state whilst an initial assessment is conducted and treatment is being established. A formal GCS should be undertaken in more complex patient presentations.
- A child cannot have a conscious state assessment done while asleep. They must be woken first. If the child wakes and remains awake and alert, record this as an “A” for AVPU. If the child wakes but remains drowsy and appears inattentive, record this as a “V”.

Pt response:

When assessed, is the Pt:

A = alert
V = responds to voice
P = responds to pain
U = unresponsive

Glasgow Coma Scale

<table>
<thead>
<tr>
<th>Child ≤ 4 years</th>
<th>Child &gt; 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye opening</strong></td>
<td><strong>Eye opening</strong></td>
</tr>
<tr>
<td>Spontaneous – 4</td>
<td>Spontaneous – 4</td>
</tr>
<tr>
<td>To voice – 3</td>
<td>To voice – 3</td>
</tr>
<tr>
<td>To pain – 2</td>
<td>To pain – 2</td>
</tr>
<tr>
<td>None – 1</td>
<td>None – 1</td>
</tr>
<tr>
<td><strong>Verbal response</strong></td>
<td><strong>Verbal response</strong></td>
</tr>
<tr>
<td>Appropriate words/social smile – 5</td>
<td>Orientated – 5</td>
</tr>
<tr>
<td>Cries but consolable – 4</td>
<td>Confused – 4</td>
</tr>
<tr>
<td>Persistently irritable – 3</td>
<td>Inappropriate words – 3</td>
</tr>
<tr>
<td>Moans to pain – 2</td>
<td>Incomprehensible sounds – 2</td>
</tr>
<tr>
<td>None – 1</td>
<td>None – 1</td>
</tr>
<tr>
<td><strong>Motor response</strong></td>
<td><strong>Motor response</strong></td>
</tr>
<tr>
<td>Spontaneous – 6</td>
<td>Obeys command – 6</td>
</tr>
<tr>
<td>Localises to pain – 5</td>
<td>Localises to pain – 5</td>
</tr>
<tr>
<td>Withdraws from pain – 4</td>
<td>Withdraws from pain – 4</td>
</tr>
<tr>
<td>Abnormal flexion to pain – 3</td>
<td>Abnormal flexion to pain – 3</td>
</tr>
<tr>
<td>Abnormal extension to pain – 2</td>
<td>Abnormal extension to pain – 2</td>
</tr>
<tr>
<td>None – 1</td>
<td>None – 1</td>
</tr>
</tbody>
</table>
Emergency care literature and AV data indicates that children are less likely to receive analgesia than adult patients or receive less analgesia comparatively. There are many complex reasons why this happens both in and out of hospital. One of the factors that can improve analgesia for children is pain assessment. There is evidence that having a formal assessment of pain leads to improved awareness of treating pain and an appropriate increased use of analgesics. If a child presents with an illness or injury that may be associated with pain, formal assessment should be conducted and documented.

Paediatric pain assessment should be tailored to the developmental level of the child. Pain may be communicated by words or sounds, expressions or behaviour such as crying, grimacing or guarding a body part. Irrespective of age, pain should not be documented as “unable to rate” without some comment on signs, symptoms and behaviour to indicate that an assessment has been completed.

Distraction therapy is a useful adjunct for analgesia with children. Many methods may assist including use of toys or improvised toys (car keys for example), distraction with a pen-torch or use of a caregiver device such as a phone or tablet.

If pain relief needs to be delivered with a method that may involve discomfort for the child (IV or IM), consider use of an ice-pack for 30-60 seconds on the site first.

Include the caregiver in the assessment and management of pain. They may be able to identify behaviours that indicate that their child is in pain e.g. a normally talkative child that is quiet. This will also provide important, meaningful involvement for the caregiver.

There are many paediatric pain scales with no specific evidence as to which one is best. Irrespective of which one is preferred, it is important that one is chosen and that the same pain scale is used throughout the episode of care for consistency of reporting to guide care.

Establishing a good rapport, building trust and being aware of non verbal cues are important elements of pain assessment in paediatric patients. Children will communicate their pain in different ways and to varying degrees at different developmental stages, even after they are able to communicate verbally. For example children around 5 years of age may describe all pain as a “tummy ache” irrespective of where the pain is in their body and adolescents may be unwilling to accurately describe their pain if they are concerned about exposing specific areas of their body.

For paediatric patients in pain, Fentanyl IN is well established as a safe and effective analgesic. It is the preferred option of RCH in most cases.
The FLACC Scale

<table>
<thead>
<tr>
<th>The FLACC Scale</th>
<th>0 points</th>
<th>1 point</th>
<th>2 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face</td>
<td>No particular expression or smile</td>
<td>Occasional grimace or frown, withdrawn, disinterested</td>
<td>Frequent to constant frown, clenched jaw, quivering chin</td>
</tr>
<tr>
<td>Legs</td>
<td>Normal position or relaxed</td>
<td>Uneasy, restless, tense</td>
<td>Kicking or legs drawn up</td>
</tr>
<tr>
<td>Activity</td>
<td>Lying quietly, normal position, moves easily</td>
<td>Squirming, shifting back and forth, tense</td>
<td>Arched, rigid or jerking</td>
</tr>
<tr>
<td>Cry</td>
<td>No cry (awake or asleep)</td>
<td>Moans or whimpers, occasional complaints</td>
<td>Crying steadily, screams or sobs, frequent complaints</td>
</tr>
<tr>
<td>Consolability</td>
<td>Content, relaxed</td>
<td>Reassured by occasional touching, hugging, or being spoken to, distractible</td>
<td>Difficult to console or comfort</td>
</tr>
</tbody>
</table>

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Faces pain scale

When talking to the child say either “hurt” or “pain”, whichever seems right for a particular child.

“These faces show how much something can hurt. This face [point to face on far left] shows no pain. The faces show more and more pain [point to each from left to right] up to this one [point to face on far right] - it shows very much pain. Point to the face that shows how much you hurt [right now].”

Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so “0” = “no pain” and “10” = “very much pain”. Do not use words like “happy” or “sad”. This scale is intended to measure how children feel inside, not how their face looks.

## Verbal Numerical Scale

This scale asks the patient to rate their pain from “no pain” (0) to “worst pain possible” (10) and is suitable for use in children over six years of age who have an understanding of the concepts of rank and order. Avoid prompting the patient with examples using numbers. Some patients are unable to use this scale with only verbal instructions but may be able to look at a number scale and point to the number that describes the intensity of their pain.
### Paediatric Chart

<table>
<thead>
<tr>
<th>Age</th>
<th>0</th>
<th>3 Mth</th>
<th>6 Mth</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3.5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>Normal lower limit</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
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<td>16</td>
<td>16</td>
<td>/minute</td>
</tr>
<tr>
<td>Normal upper limit</td>
<td>60</td>
<td>60</td>
<td>55</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>34</td>
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<td>34</td>
<td>/minute</td>
</tr>
<tr>
<td>Pulse</td>
<td>110</td>
<td>110</td>
<td>115</td>
<td>85</td>
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<td>85</td>
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<td>70</td>
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<td>70</td>
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<td>70</td>
<td>70</td>
<td>/minute</td>
</tr>
<tr>
<td>Normal lower limit</td>
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<td>170</td>
<td>185</td>
<td>150</td>
<td>150</td>
<td>150</td>
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<td>135</td>
<td>135</td>
<td>/minute</td>
</tr>
<tr>
<td>Normal upper limit</td>
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<td>60</td>
<td>65</td>
<td>70</td>
<td>70</td>
<td>70</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>mmHg</td>
</tr>
<tr>
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<td>3.5</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
<td>5.0</td>
<td>5.0</td>
<td>5.5</td>
<td>6.0</td>
<td>6.0</td>
<td>6.5</td>
<td>6.5</td>
<td>7.0</td>
<td>7.0</td>
<td>mm</td>
</tr>
<tr>
<td>ETT</td>
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<td>9.5</td>
<td>11.5</td>
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<td>13.6</td>
<td>14</td>
<td>14.5</td>
<td>15</td>
<td>15.5</td>
<td>16</td>
<td>16.5</td>
<td>17</td>
<td>17.5</td>
<td>cm</td>
</tr>
<tr>
<td>Naso/Gastric Tube</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>14</td>
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<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>FG</td>
</tr>
<tr>
<td>Suction Catheter for ETT</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>FG</td>
</tr>
<tr>
<td>DCCS (Biphasic)</td>
<td>4 Joules/kg</td>
<td>15</td>
<td>20</td>
<td>30</td>
<td>50</td>
<td>50</td>
<td>70</td>
<td>70</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>120</td>
<td>150</td>
<td>joules</td>
</tr>
</tbody>
</table>

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
## Resuscitation drugs

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (kg)</th>
<th>0</th>
<th>3 Min</th>
<th>6 Min</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>yrs</th>
<th>Guideline</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Adrenaline 1:1,000</td>
<td>nebul.</td>
<td>0.1*</td>
<td>0.1*</td>
<td>0.1*</td>
<td>0.1</td>
<td>0.12</td>
<td>0.14</td>
<td>0.16</td>
<td>0.18</td>
<td>0.2</td>
<td>0.22</td>
<td>0.24</td>
<td>0.26</td>
<td>0.33</td>
<td>0.36</td>
<td>mL</td>
<td>Upr airway oedema</td>
</tr>
<tr>
<td>1 mg/1 mL (1 mg = 1 ml)</td>
<td>1 ml syringe</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
<td>200</td>
<td>220</td>
<td>240</td>
<td>260</td>
<td>300</td>
<td>360</td>
<td>mcg</td>
<td>ALS anaphylaxis, asthma</td>
</tr>
<tr>
<td>Adrenaline 1:1,000</td>
<td>10 mcg/kg</td>
<td>1:10,000</td>
<td>0.1</td>
<td>0.12</td>
<td>0.14</td>
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<td>0.2</td>
<td>0.22</td>
<td>0.24</td>
<td>0.26</td>
<td>0.33</td>
<td>0.36</td>
<td>mL</td>
<td>MCA anaphylaxis, asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 mg/1 mL (1 mg = 1 mg)</td>
<td>1 ml syringe</td>
<td>35</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
<td>200</td>
<td>220</td>
<td>240</td>
<td>260</td>
<td>300</td>
<td>360</td>
<td>mcg</td>
<td></td>
</tr>
<tr>
<td>Adrenaline 1:10,000</td>
<td>10 mcg/kg</td>
<td>0.35</td>
<td>0.6</td>
<td>0.8</td>
<td>1</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>1.8</td>
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<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
<td>3.3</td>
<td>3.6</td>
<td>mL</td>
<td>MCA anaphylaxis, cardiac arrest, asthma</td>
</tr>
<tr>
<td>1 mg/10 mL (1 mL = 100 mcg)</td>
<td>1 ml syringe</td>
<td>35</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
<td>200</td>
<td>220</td>
<td>240</td>
<td>260</td>
<td>300</td>
<td>360</td>
<td>mcg</td>
<td></td>
</tr>
<tr>
<td>Sodium Bicarbonate 8.4%</td>
<td>2 mL/kg</td>
<td>7</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>28</td>
<td>32</td>
<td>36</td>
<td>40</td>
<td>44</td>
<td>48</td>
<td>52</td>
<td>56</td>
<td>62</td>
<td>72 mL</td>
<td>Cardiac arrest (TCA OD or hypokalaemia, TCA OD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 mL</td>
<td>Minipet syringe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>5 mg/kg</td>
<td>1.75</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>110</td>
<td>120</td>
<td>130</td>
<td>145</td>
<td>180</td>
<td>mg</td>
<td>V/VT arrest</td>
</tr>
<tr>
<td>100 mg/10 mL (see across for dilution info) (1 mL = 10 mg)</td>
<td></td>
<td>17.5</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
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<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amiodarone</td>
<td>5 mg/kg</td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
<td>3.3</td>
<td>3.6</td>
<td>110</td>
<td>120</td>
<td>130</td>
<td>145</td>
<td>180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mg</td>
<td></td>
</tr>
<tr>
<td>150 mg/3 mL (1 mL = 50 mg)</td>
<td></td>
<td>10 mL</td>
<td>syringe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syringe Scales</td>
<td></td>
<td>1 mL/0.01 mL increments</td>
<td>2.5 mL/0.1 mL increments</td>
<td>10 mL/0.2 mL increments increments</td>
<td>50 mL/1 mL</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*0.1 mL has been made a minimum vol to reduce dosage error. The minimum vol is sometimes different to the prescribed dose and should be recorded/handed over as the dose delivered.

An example of the error that occurs in a vol less than 0.1 mL, is as follows: required dose vol of 0.07 mL, 0.7 mL is prepared and the Pt incorrectly receives 10 x required dose.
# Ceftriaxone and Dextrose

<table>
<thead>
<tr>
<th>Age</th>
<th>9</th>
<th>3 Mth</th>
<th>6 Mth</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>Yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3.5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>33</td>
<td>36</td>
<td>kg</td>
</tr>
<tr>
<td>Ceftriaxone (IM)</td>
<td>50 mg/kg</td>
<td>1 g diluted with 3.5 mL 1% Lignocaine (1 mL = 250 mg)</td>
<td>0.7</td>
<td>1.2</td>
<td>1.6</td>
<td>2</td>
<td>2.4</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4 mL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 mL syringe</td>
<td>175</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>900</td>
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<td>1000</td>
<td>1000</td>
<td>1000 mg</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceftriaxone (IV)</td>
<td>50 mg/kg</td>
<td>1 g diluted with 0.5 mL Water for Injection (1 mL = 100 mg)</td>
<td>1.75</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10 mL</td>
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<td>10 mL syringe</td>
<td>175</td>
<td>300</td>
<td>400</td>
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<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000 mg</td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Dextrose 10%</td>
<td>3 mL/kg</td>
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<td>36</td>
<td>40</td>
<td>44</td>
<td>48</td>
<td>52</td>
<td>66</td>
</tr>
</tbody>
</table>

Use a 50 mL syringe or infusion depending on volume to be delivered.

Drug dose errors can occur when calculations are required. All appropriate checking procedures should be followed including, where available 2 Paramedics independently confirming the required dose and vol and/or checking against approved AV reference material prior to administration.
# Fentanyl, Midazolam, Morphine and Naloxone

<table>
<thead>
<tr>
<th>Age</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 mg/kg</td>
<td>Emergency sedation</td>
</tr>
<tr>
<td>0.1 mg/kg</td>
<td>Post - ET sedation</td>
</tr>
<tr>
<td>0.25 mg/kg</td>
<td>For induction doses, see CPG P0301</td>
</tr>
<tr>
<td>0.1 mg/kg</td>
<td>Extreme traumatic pain</td>
</tr>
<tr>
<td>0.008</td>
<td>Pain relief</td>
</tr>
<tr>
<td>0.1</td>
<td>Opioid overdose</td>
</tr>
</tbody>
</table>

**Fentanyl (IV)**

- 100 mcg/10 mL (1 mL = 10 mcg)
- Add 2 mL (100 mcg) Fentanyl (from 100 mcg in 2 mL ampoule) to 8 mL Normal Saline in a 10 mL syringe

**Midazolam (IV)**

- 15 mg/15 mL (1 mL = 1 mg)
- Add 3 mL (15 mg) Midazolam (from 15 mg in 3 mL ampoule) to 12 mL Normal Saline in a 20 mL syringe

**Ketamine (IV)**

- 200 mg/20 mL (1 mL = 10 mg)
- Add 2 mL (200 mg) Ketamine to 18 mL Normal Saline in 20 mL syringe

**Morphine (IM)**

- 10 mg/1 mL (1 mL = 10 mg)

**Naloxone (IM)**

- 400 mcg/1 mL (1 mL = 400 mcg)

Drug dose errors can occur when calculations are required. All appropriate checking procedures should be followed including, where available, Paramedics independently confirming the required dose and volume and/or checking against approved AV reference material prior to administration.
# Normal Saline and Dexamethasone

## Normal Saline and Dexamethasone

<table>
<thead>
<tr>
<th>Age</th>
<th>0</th>
<th>3 Mth</th>
<th>6 Mth</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>Yrs</th>
<th>Guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3.5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>33</td>
<td>36</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>Normal Saline</td>
<td>20 mL/kg</td>
<td>79</td>
<td>120</td>
<td>160</td>
<td>200</td>
<td>240</td>
<td>280</td>
<td>320</td>
<td>360</td>
<td>400</td>
<td>440</td>
<td>480</td>
<td>520</td>
<td>660</td>
<td>720 mL</td>
<td>Hypovolaemia, asthma, cardiac arrest, anaphylaxis</td>
</tr>
</tbody>
</table>

Use a 50 mL syringe or infusion depending on volume to be delivered.

<table>
<thead>
<tr>
<th>Dexamethasone</th>
<th>600 mcg/kg</th>
<th>0.52</th>
<th>0.9</th>
<th>1.2</th>
<th>1.5</th>
<th>1.9</th>
<th>2.1</th>
<th>2.4</th>
<th>2.7</th>
<th>3</th>
<th>3</th>
<th>3</th>
<th>3</th>
<th>3</th>
<th>mL</th>
<th>Asthma (MCA), croup (AMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 mg in 2 mL (1 mL = 4 mcg)</td>
<td>2.1</td>
<td>3.6</td>
<td>4.8</td>
<td>6</td>
<td>7.2</td>
<td>8.4</td>
<td>9.6</td>
<td>10.8</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 mL syringe</td>
<td>2.5 mL syringe</td>
<td>5 mL syringe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drug dose errors can occur when calculations are required. All appropriate checking procedures should be followed including, where available, 2 Paramedics independently confirming the required dose and vol and/or checking against approved AV reference material prior to administration.
Time Critical Guidelines (Trauma Triage)  CPG P0105

Flowchart

Pre-Hospital Vital Signs Major Trauma Criteria

In the setting of potential major trauma, a child is considered time critical if they meet any of the following criteria (patients > 12 years of age should be assessed as per CPG A0105 Time critical guidelines):

<table>
<thead>
<tr>
<th>Age</th>
<th>0 - 3 months</th>
<th>4 - 12 months</th>
<th>1 - 4 years</th>
<th>5 - 11 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>&lt;100 or &gt;180</td>
<td>&lt;100 or &gt;180</td>
<td>&lt;90 or &gt;160</td>
<td>&lt;80 or &gt;140</td>
</tr>
<tr>
<td>RR</td>
<td>&gt;80</td>
<td>&gt;60</td>
<td>&gt;40</td>
<td>&gt;30</td>
</tr>
<tr>
<td>Syst BP</td>
<td>&lt;80 mmHg</td>
<td>&lt; 60 mmHg</td>
<td>&lt;70 mmHg</td>
<td>&lt; 80 mmHg</td>
</tr>
<tr>
<td>SaO2</td>
<td>&lt; 90%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCS</td>
<td>&lt;15 (or less than Alert on AVPU)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Does the patient have abnormal vital signs meeting the major trauma criteria?

No

Assess patient for specific injuries

Yes

Specific Injuries Meeting Potential Major Trauma Criteria

All penetrating injuries (except isolated superficial limb injuries)

- Blunt injuries
  - Serious injury to a single body region such that specialised care or intervention may be required or such that life, limb or long-term quality of life may be at risk
  - Significant injuries involving more than one body region

Specific Injuries

- Limb amputation / limb threatening injuries
- Suspected spiral cord injury or spinal fracture
- Burns >10% TBSA or suspected respiratory tract burns
- High voltage burn injury
- Serious crush injury
- Major compound fracture or open dislocation
- Fracture to 2 or more of femur/tibia/humerus
- Fractured pelvis

Does the patient have specific injuries meeting the potential major trauma criteria?

No

Assess patient against high risk criteria for major trauma

High Risk Criteria for Major Trauma

Assess for mechanism of injury:

- Motor / cyclist impact > 30mph
- High speed MCA > 60mph
- Pedestrian impact
- Ejection from vehicle
- Prolonged deceleration
- Fall from height > 3m
- Struck on head by object falling > 3m
- Explosion

Does the patient meet the high risk criteria?

No

Transport to the nearest appropriate emergency care facility

Yes

Transport to the highest level of trauma service within 45 minutes travel

Assess for mechanism of injury:

- Motor / cyclist impact > 30mph
- High speed MCA > 60mph
- Pedestrian impact
- Ejection from vehicle
- Prolonged deceleration
- Fall from height > 3m
- Struck on head by object falling > 3m
- Explosion

Does the patient meet the high risk criteria?

No

Transport to the nearest appropriate emergency care facility

Yes

Transport to the highest level of trauma service within 45 minutes travel

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Care Objectives

- To accurately assess patient safety risk
- To transport patients who are at risk of deterioration or adverse outcome

General Notes

Intended patient group

- All paediatric patients (age < 12 years)

Patient Safety Risk

- The Patient Safety Risks are a selection of general risk factors that should be considered as part of the Diagnostic Phase for all patients. No specific combination of risks mandates transport, but any patient judged to be at risk of deterioration or adverse outcome should be transported to hospital.
- The presence of significant risk of any kind should outweigh an apparently benign diagnosis in determining the care plan.

Diagnostic uncertainty

- Diagnostic uncertainty is a significant source of risk. The recognition of significant risk (i.e. where a diagnosis is uncertain or the patient otherwise presents an unacceptable level of risk independent of their diagnosis) should prompt a change in the care plan. This will frequently include transport to hospital.
- Few paramedics develop an experience base which provides them with expertise in assessing and managing paediatric patients. This should result in a low threshold for either transport or seeking expert advice to assist decision-making.
- Parental concern is a valid reason for a child to be seen by a medical practitioner and should not be discounted.

Clinical course / deterioration

- Many patients will present without any obvious concerning findings at the time of assessment but may go on to deteriorate in a predictable way. In addition to the patient’s condition at the time of assessment, paramedics must consider the likely or possible clinical course and where the patient currently sits on that trajectory. An appropriate care plan may include transporting patients who do not have concerning findings at the time of assessment but who still present a reasonable risk of deterioration.

Bias and human factors

- Biases can influence assessment and decision making. No individual is immune to bias, but recognising and acknowledging that a bias is present can help to mitigate the impact on subsequent decisions.
- Patients with mental health problems, substance dependence and Aboriginal and Torres Strait Islanders are at particular risk of the unconscious bias of health care professionals.
Clinical Flags

- **Red Flags** mandate transport. Where paramedics believe transport is not required, they must contact the AV Clinician.

- The Red Flags are not an exhaustive list. Where patients present with abnormal vital signs that do not meet Red Flag criteria, staff are encouraged to maintain a high index of suspicion for serious illness. Similarly, there are other specific conditions that will require transport not listed here.

- If a patient does not meet any Red Flags, but staff have a non-specific concern (“gut instinct”) about their health or welfare, the patient should be transported to ED.

- The Red Flags do not indicate a need for MICA, however, any patient with deranged vital signs is at risk of deterioration. Escalation of care, including MICA, should be considered.

- Some patients will meet the abnormal vital sign criteria at initial presentation but will respond well to treatment, such as heroin overdose or hypoglycaemia. It is reasonable to treat these patients and reassess, with transport or non-transport decisions being based on subsequent sets of vital signs. If patients do not respond to treatment as expected, transport is required.

- **Yellow Flags** do not mandate transport. However, patients with one or more yellow flags must be advised to attend hospital or GP within two hours via their own transport arrangements. If this is not possible for any reason, the other options to escalate care should be explored (e.g. Patient Transport or transport via emergency ambulance).
Patient Safety Risk

Patients at risk of deterioration or adverse outcome if not transported must be taken to hospital by ambulance. Transport by other means may be appropriate in some circumstances.

Consider risk of **diagnostic error:**

- Diagnostic uncertainty
- Bias and human factors
- Age, comorbidities and baseline functioning
- Communication difficulties (e.g. non-verbal, NESB, intellectual disability, developmental delay)
- Current drug or alcohol intoxication
- History of mental health problems
- Aboriginal or Torres Strait Islander
- Multiple comorbidities / complex medical history / ≥ 5 medications
- Rare medical condition
- Highly emotive scene

Consider risk of **deterioration:**

- Expected clinical course / trajectory
- Borderline vital signs
- Failure to respond to community based treatment as expected

Consider **social / environmental risk:**

- Risks to the safety of the patient
- Poor health literacy
- Adequate shelter and warmth

Consider **access to care:**

- The supply of required medications
- Ability to access necessary health services or further help if required
Red Flags

Patients meeting any of the following criteria must be transported to hospital by ambulance*. Consider notification.

- Abnormal vital sign

<table>
<thead>
<tr>
<th>Age</th>
<th>HR bpm</th>
<th>RR breath / min</th>
<th>SBP mmHg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn (&lt; 24 hours)</td>
<td>&lt; 110 or &gt; 170</td>
<td>&lt; 25 or &gt; 60</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>Small infant (&lt; 3 months)</td>
<td>&lt; 110 or &gt; 170</td>
<td>&lt; 25 or &gt; 60</td>
<td>&lt; 60</td>
</tr>
<tr>
<td>Large infant (3 – 12 months)</td>
<td>&lt; 105 or &gt; 165</td>
<td>&lt; 25 or &gt; 55</td>
<td>&lt; 65</td>
</tr>
<tr>
<td>Small child (1 – 4 years)</td>
<td>&lt; 85 or &gt; 150</td>
<td>&lt; 20 or &gt; 40</td>
<td>&lt; 70</td>
</tr>
<tr>
<td>Medium Child (5 – 11 years)</td>
<td>&lt; 70 or &gt; 135</td>
<td>&lt; 16 or &gt; 34</td>
<td>&lt; 80</td>
</tr>
</tbody>
</table>

N.B. In the setting of trauma consider CPG P0105 Time Critical Guidelines (Trauma Triage)

- **GCS** < 15 or not alert (as per AVPU)
- **SpO₂** < 96 %
- Unexplained pain (including behavioural cues in non-verbal aged paediatrics e.g. inconsolable, agitated)
- Second presentation within 48 hours to AV or a Medical Practitioner for related complaint

**Specific Conditions:**

- Febrile > 38°C in small infant (< 3 months old)
- Stridor
- First presentation seizure
- Anaphylaxis (including resolved or possible anaphylaxis or the post-adrenaline patient)
- Unable to walk (when usually able to walk)
- Post-tonsillectomy bleeding (of any amount) up to 14 days post-operation
- Testicular pain
- Ingestion/inhalation of toxic substance
- Inhalation of foreign body
- Non-blanching rash

*Where the patient/carer/guardian refuses transport or paramedics believe transport is not warranted, the AV Clinician MUST be contacted.*
Yellow Flags

Patients meeting any of the following criteria must be advised to attend hospital or GP within two hours via own transport arrangements.

- Ongoing parental concern
- Ingestion of a dangerous foreign body - asymptomatic/normal VSS (including button batteries and magnets)
- Surgical procedure within past 14 days

AND patient’s carer must:

- Have capability to transport patient to hospital/GP
- Be read Referral Advice Script

Referral Advice Script

“Our assessment indicates that your child does not currently require transport to hospital in an emergency ambulance.

However, your child needs to be reviewed by a medical doctor within the next two hours, and we would recommend that you transport them to your GP or the emergency department in your own vehicle.

If you are unable to do so on your own we will assist you.”

This script does not remove the need to seek valid consent including a full explanation of the clinical findings, possible diagnosis, limitations of assessment, and any risks associated with a care pathway.

No flag criteria met

Where the patient does not meet any Red or Yellow Flags and is assessed as being suitable for non-transport, encourage family/carer to see GP for follow-up within 48 hours.
Intended patient group

- A “child” covered under the relevant legislations is defined as babies, children and young people up to and including 17 years of age. Unborn babies are not legally defined as children, but are still covered under this legislation.

Overview

Ambulance Victoria (AV) is a Child Safe organisation and is committed to meeting the Victorian Government’s Child Safe Standards and our legal duty of care to children. All Operational staff have a responsibility to ensure their personal behaviour and actions align with our Child Safety Procedure (PRO/OPS/261) and Child Safety Code of Conduct.

This information is designed to assist Operational staff to ‘Assess, support, and report’ cases involving child abuse, sexual offences against children, or child safety concerns.

- Child safety concerns may involve physical abuse, sexual abuse, sexual offences against children, emotional abuse, psychological abuse, cultural abuse, and neglect. Such abuse or neglect may have occurred, or may be likely to occur in the future.
- Child safety risk factors may include family violence, parent/caregiver alcohol and drug abuse, mental health problems, cognitive impairment, homelessness, illness, failure to provide for care, poor parenting skills or support and/or social isolation. These risk factors frequently co-exist.
- Children witnessing other family members experiencing violence is a legitimate child safety concern.
- Violence and abuse can have damaging cumulative physical and mental health effects that can last for many years after abuse has ended. These include depression, suicidality, alcohol and drug abuse, post-traumatic stress disorder, eating and sleeping disorders, anxiety disorders and injuries.

The role of paramedics

- Operational staff may see victims of abuse during the early stages of their victimisation, before other professionals such as child protection, justice or health services staff. We can play a role in reducing the impacts of abuse and abuse-associated health problems by identifying those at risk early; offering skilled and compassionate support; and reporting to relevant services to support children who may need care and protection.
- Where there is a belief that child abuse exists or a child’s safety is at risk Operational staff must report and handover to either Police or Child Protection Services (depending on the urgency of the case), or the AV Integrity Officer who can report the case to Child Protection Services on your behalf. In cases where a child is transported, all relevant details must also be handed over to a health professional who is a mandated reporter (e.g. a doctor or nurse), as per the Child Safety Procedure. The health service handover should include mention of the plan to report the case to Child Protection Services via the AV integrity officer.
- Record all relevant objective clinical data and observations on a PCR specific to the child.
- Paramedic safety is paramount. A dynamic risk assessment, including any dangers, should form part of any clinical approach. Ensure personal and scene safety and request Police attendance if required.
Unacceptable conduct

- AV staff who witness or reasonably suspect unacceptable conduct by their colleagues must promptly report their concern to the Professional Conduct Unit (PCU) and Police for suspected criminal child abuse. This is a mandatory report.

- Unacceptable conduct may occur within work or private settings, and includes sexual offences, sexual misconduct or physical violence against, with or in the presence of a child; any behaviour that causes significant emotional or psychological harm to a child; and/or significant neglect of a child.

Staff welfare

Child safety procedures may raise personal issues or concerns for staff, including secondary trauma related to observations in community response. Staff are encouraged to proactively seek support from Peer Support or the VACU psychologist via 1800 MANERS (1800 626 377).
Flowchart

**Check Reasonable Belief**
Do you have a reasonable belief that a child
- has been a victim of a sexual offence, or
- has been harmed, or
- is at risk of harm, abuse or neglect as a result of family violence and/or child abuse?

Reasonable belief might be formed if, for example:
- Criminal activity is evident
- A child states they have been abused
- A child states they know someone who has been abused
- Another person states the child has been abused
- Observation of behaviour leads to a belief that the child has been or may be abused
- Signs of abuse are observed
- Co-occurrence of family violence exists

**Immediate Risk**
- Child at risk of, or who has suffered any of the following:
  - **Physical injury**
  - A sexual offence or sexual abuse
  - Who is in an environment exposing them to an unreasonable risk of harm
  - Parents unable or unwilling to protect them from harm (including due to drug / alcohol intoxication)

- Request Victoria Police

**Non-Urgent Risk**
- Basic needs not being met, or
- Medical care not being arranged, or
- Risk of physical or psychological harm due to family violence

- If transported, report concerns directly to Child Protection Services or to the AV Integrity Officer and handover observations / suspicions to a health professional who is a mandated reporter (FN Div. 1 or Dr)
- If not transported, report concerns directly to Child Protection Services or to the AV Integrity Officer who will report the case to Child Protection Services on your behalf

**Support for the child**
- Provide emotional support for children with identified or suspected safety concerns
  - Ask the child if they are ok
  - Believe what the child is telling you, and thank them for trusting you enough to tell you
  - Reassure the child that you believe them, that no one deserves to be hurt or neglected, and that it was not their fault
  - Tell them you will seek help for them and their family / caregivers
  - Communicate your concerns about the child with their parents / caregivers if safe and appropriate

**Documentation**
- Document relevant objective clinical and observational data on a PCR specific to the child.
Cardiac Arrest

Care Objectives

- Effective airway control and adequate ventilation with oxygen is the cornerstone of paediatric resuscitation.

General Notes

- This guideline should be applied to patients < 12 years of age who are unresponsive, not breathing normally and:
  - Pulseless; or
  - HR < 60 bpm (infants); or
  - HR < 40 bpm (children)

- Manage newborn patients (< 24 hrs old) as per CPG N0201 Newborn Resuscitation

- For patients ≥ 12 years manage as per CPG A0201 Cardiac Arrest (Adult)

- Cardiac arrest in children and infants is commonly caused by hypoxia, hence the intent of this guideline is to provide airway and ventilatory support as a priority. Respiratory arrest followed by bradycardic cardiac arrest may be corrected with ventilation prior to commencing chest compressions.

- VF / Pulseless VT is rare in paediatric cases.

- Fluid administration in shockable rhythms may be detrimental and should be limited to medication flush and TKVO only

- During cardiac arrest, rhythm analyses are required every two minutes. Carotid pulse checks are only required for a potentially perfusing rhythm i.e. the presence of QRS complexes which would be expected to be accompanied by a rise in EtCO₂

- When ETT is attempted, it should not interrupt compressions

- EtCO₂
  - Can be used as a surrogate marker of cardiac output during cardiac arrest.
  - May be falsely low in very young infants due to low tidal volumes
  - A gradual fall may suggest CPR fatigue

Airway positioning

- Padding under shoulders may be required to correct flexion in small children while supine due to their comparatively larger occiput

- Use neck and head extension with caution in children < 8 years of age
**High-Performance CPR**

- Prioritise airway and ventilation

- Perform high-quality CPR:
  - Rate: 100 - 120 compressions per minute
  - Depth: 1/3 chest depth, allow for full recoil
  - Ventilation duration: 1 second per ventilation
  - 2 minute rotations of compressor

- Minimise interruptions to chest compressions
  - Focus on team performance and communication
  - Charge defibrillator during compressions
  - On-screen rhythm analysis
  - Hover hands over chest and resume compressions immediately after defibrillation or disarm

- Utilise Team Leader and checklist

**General Notes**

**Compression technique**

- **Infant:**
  - Two rescuers: Two-thumb technique preferred. The hands encircle the chest and thumbs compress the sternum. Take care not to restrict chest expansion during recoil or ventilation.
  - Single rescuer: Two-finger technique preferred in order to minimise transition time between compressions and ventilations.

- **Small Child:** One-hand technique (otherwise similar to that for adults)

- **Medium Child:** Two-handed technique (as for adults)

**Ratios of compressions to ventilations**

- **No ETT/SGA**
  - 15 compressions : 2 ventilations
  - 30 compressions : 2 ventilations (single rescuer)
  - Pause for ventilations

- **ETT/SGA insitu**
  - 10 ventilations per minute
  - No pause for ventilations

- **NB. Evidence suggests compression rates often differ from recommendations. Consider using metronome if available.**

**Intraosseous (IO) cannulation**
• Proceed directly to IO access if IV access cannot be achieved within 60 seconds

**Hypothermic cardiac arrest < 30°C**

• The primary goal is to prevent further heat loss prior to ROSC or transport - significant improvement in temperature from prehospital intervention is unlikely
• Double the interval for *Adrenaline* and *Amiodarone* doses
• Greater than 3 shocks is unlikely to be successful while patient remains severely hypothermic - consider AAV for transport. Where these resources are not available, continue DCCS as per standard cardiac arrest

**PEA reversible causes**

• Tension pneumothorax
• Upper airway obstruction
• Exsanguination
• Asthma
• Anaphylaxis
• Hypoxia

**Tension pneumothorax**

• Where tension pneumothorax is considered to be the cause of cardiac arrest, in either medical or traumatic arrest, decompress chest bilaterally as per *CPG P0802 Chest Injuries*
• Chest decompression should not be routine in medical cardiac arrest

**TCA overdose or hyperkalaemia**

• Administer *Sodium bicarbonate 8.4% 2 mL/kg IV/IO*
• Sodium bicarbonate should not be routinely administered outside of this setting

**Hypovolaemia / anaphylaxis / asthma**

• In PEA arrest where hypovolaemia, anaphylaxis or asthma is suspected or the patient has a rhythm that may be fluid responsive, administer *Normal Saline 20 mL/kg IV/IO*

**Hypoglycaemia**

• Hypoglycaemia in cardiac arrest is rare. However, BGL should be measured and hypoglycaemia treated as per *CPG P0702 Hypoglycaemia*
• All other management to be prioritised above BGL measurement
Flowchart

**Medical cardiac arrest**
- Unconscious and not breathing normally
- Hx, MOI or injuries do not suggest traumatic cause of cardiac arrest

**Action**
- BVM ventilation (with OPA / NPA if required)
- Apply multifunction electrode pads and perform pulse check

**Patient remains unresponsive**
- Pulseless or HR < 40 (Infant: HR < 60)

**VF / Pulseless VT**

**Prioritise High-Performance CPR and timely defibrillation**

**Action**
- Defibrillate 4 J/kg
- Immediately recommence chest compressions
- Amiodarone 5 mg/kg IV / IO if VF / VT after 3rd shock
- Amiodarone 5 mg/kg IV / IO if VF / VT persists after 5th shock (max. combined dose 450 mg)

**Asystole / PEA / Severe Bradycardia**

**Prioritise High-Performance CPR**

**Action**
- Immediately recommence chest compressions
- PEA: Consider reversible causes
  - Tension pneumothorax
  - Upper airway obstruction
  - Exsanguination
- Asthma
- Anaphylaxis
- Hypoxia

**2-minute cycle finishes**

**All cardiac arrest patients**

**Action**
- SGA / ETT
- IV access / Normal Saline TKVO
- Adrenaline 10 mcg/kg IV/IO repeat every 2nd cycle (4-minutely)
- Flush all medications with Normal Saline
- Where time permits ETCO₂ monitoring & insert OG tube

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Care Objectives

- **Major haemorrhage control** over all other interventions
- **Management of correctable causes** in order of clinical need:
  - Oxygenation / ventilation
  - Exclusion of tension pneumothorax by insertion of bilateral intercostal catheters
  - Administration of Normal Saline 20mL/kg IV/IO
- Standard cardiac arrest management including rhythm check following the trauma priorities

General Care

- Consider medical cause in cases where the Hx, MOI or injuries are inconsistent with traumatic cardiac arrest, or patient is in VF / VT. If any doubt exists as to the cause of arrest, treat as per Medical Cardiac Arrest
- Control of major haemorrhage can be achieved with tourniquets, haemostatic dressings and/or direct pressure
- Undifferentiated blunt trauma: A pelvic splint should be applied after other interventions. Where pelvic fracture is clearly contributing to cardiac arrest, a pelvic splint may be applied earlier
Flowchart

Traumatic cardiac arrest
- Hx, MOI or injuries do not suggest medical cause of cardiac arrest

Major haemorrhage
Prioritise control of major haemorrhage over all other interventions

Prioritise treatment of correctable causes of cardiac arrest over chest compressions and in order of clinical need

- Action
  - Airway
    - Ensure patent airway, oxygenation and ventilation
    - ETT if required

- Action
  - Tension pneumothorax
    - Decompress tension pneumothorax

- Action
  - Volume replacement
    - IV / IO access
    - Normal Saline 20 mL/kg IV/IO

Cardiac arrest persists despite addressing correctable causes

- Action
  - Treat as per CPG P0201 Cardiac arrest including chest compressions and Adrenaline.
Flowchart

**Status**
- Post cardiac arrest

**Intubation/ventilation**
- Consider ETT as per CPG P0301 Endotracheal Intubation (Paediatric) if not already intubated
- Maintain ETT as per P0301 Endotracheal Intubation (Paediatric)
- Target ETCO₂ 30-40mmHg
  Ventilate 10 mL/kg

**Perfusion Mx**
- Accurately assess pulse during movement/loading to ensure C.O. maintained throughout
- Normal Saline 20 mL/kg IV/IO in combination with adrenaline
- Commence Adrenaline Infusion at 0.05 mcg/kg/min
  - Titrate to effect (max 1 mcg/kg/min)
  - Consult with RCH regarding ongoing circulatory support at earliest convenience.
- Do not administer Amiodarone unless breakthrough VF/VT occurs

**Tx**
- Action
  - Appropriate receiving hospital
  - Notify early
Care Objectives

- Ensure safe and effective ventilation throughout entire episode of care

General Notes

Intended patient group

- Patients < 12 years of age.
- Patients < 5 years of age: intubation during cardiac arrest should be deferred until ROSC unless the airway cannot be adequately managed with a BVM or SGA alone. Prioritise management with a BVM or SGA until ROSC is achieved.

Tube selection

- Children under 3.0 kg or premature babies should be intubated with a size 2.5 mm or 3.0 mm uncuffed ETT as per CPG N0201 Newborn Resuscitation.
- A cuffed ETT should not be used for children if a manometer is not available to ensure appropriate cuff pressure at inflation. The cuff should be inflated to a pressure of 20 – 30 cmH₂O.

Risk-benefit analysis

- A dynamic risk-benefit analysis is required for every prehospital intubation and should include evaluation of any precautions alongside the clinical context. Prehospital intubation may cause patient harm.
- Minimising scene times should be prioritised over the decision to perform prehospital intubation.
- Physiological derangement refractory to or requiring significant resuscitation, such as hypotension, hypoxia and/or metabolic acidosis may be exacerbated by intubation and precipitate cardiac arrest.
- In rural and regional areas IFS may be undertaken or withheld by single-responder MICA Paramedics following consideration of risk-benefit analysis.

Capnography

- The recording of pre and post-intubation capnography is necessary to accurately describe the therapeutic effect of ETT placement. Post-intubation capnography is essential for confirmation of tracheal placement and must be noted by all paramedics at scene. If there is any doubt about tracheal placement the ETT must be immediately removed.
- If electronic capnography fails, immediately confirm using colorimetric capnometry whilst troubleshooting occurs.

Unassisted intubation

- Unassisted intubation is permitted in patients with a GCS of 3 where there are no airway reflexes present, excluding TBI/NTBI.
- Unassisted intubation is permitted in the setting of pre- and peri-arrest multi-trauma with TBI and no airway reflexes, however transport unintubated is preferred.
In this cohort, gentle laryngoscopy should be undertaken during intubation attempts and suction prepared. ETI should be abandoned if airway reflexes interfere with laryngoscopy or intubation.

Unassisted intubation is not a shortcut. Prepare and anticipate the need for rapid post ETT sedation.

Preparing and support

- When you attend a critical paediatric case, consider contacting the following experts to assist or advise:
  - AV Clinician
  - PIPER
  - Receiving hospital

- Managing a critically unwell paediatric case can be distressing. It is recommended that you make contact with AVs peer support services.

Flowchart - Indications and Preparation

- Indications
  - Airway not patent
    - Inability to support own airway such that ongoing airway maintenance and/or clearance is required
  - Respiratory failure
    - Refractory to other ventilation techniques and medications
    - OR
    - Requiring ongoing assisted manual ventilation
  - Targeted treatment required
    - E.g. status epilepticus, refractory hyperthermia, TCA overdose, ROSC

- Precautions
  - Baseline neurological function, significant comorbidities or advanced care directive may preclude intubation
  - Anticipated difficult BVM or intubation (e.g. situation, anatomical, physiological, resourceing)
  - IFS may be harmful in hypovolemic shock, multi-trauma and metabolic acidosis
  - Scenarios may be harmful where there is need for rapid in-hospital management
  - Avoid IFS in the setting of severe hypothermia < 30°C

- Risk v Benefit Analysis
  - Is prehospital intubation the most appropriate airway management for this patient?

- Preparation
  - Medications prepared
  - Laryngoscope + blade x 2
  - Video laryngoscope
  - ETT + 1 smaller & 1 larger
  - Introducer / stylet
  - Difficult airway setup
  - Suction tested

- Position
  - Optimise environment
  - Optimise patient position - ‘ear to sternum’
  - C-spine considerations

- Perfusion
  - IV / IO access x 2
  - Hydration
  - TPT release
  - Blood pressure optimised

- Pre-oxygenation
  - BVM with 5 cmH₂O PEEP and FiO₂ 1
  - Note ETCO₂ reading and confirm functional
  - Apnoea oxygenation via nasal cannula @ 12 L/min

- People
  - Ensure adequate crew resources
  - Identify team leader
  - Allocate roles
  - Briefing
  - Complete RSI Checklist
**Endotracheal Intubation**

**Flowchart - Procedure**

**Status**
- Patient prepared for intubation

**Contraindications**
- No functional electronic capnography
- When airway rescue using CPG P0302 Difficult Airway Guideline is not possible
- If GCS ≥ 10 patients can only be intubated after consultation

**Unassisted endotracheal intubation**
- No airway reflexes with gentle laryngoscopy / suction
  - **Action**
    - Proceed with intubation – no drugs required

**IFS**
- Sedation required to facilitate ETI
  - **Action**
    - Fentanyl 2 mcg/kg IV
    - Midazolam 0.2 mg/kg IV
    - If unable to administer Fentanyl
      - Morphine 0.2 mg/kg IV

**Unable to intubate due to excessive tone**
- **Action**
  - If GR 1 or 2 view but respiratory effort or airway reflexes are preventing intubation:
    - Repeat same dose of sedation and reattempt intubation once only
  - If GR 3 or 4 view:
    - Proceed to CPG P0302 Difficult Airway Guideline

**Placement**
- **Action**
  - Sight the ETT through the vocal cords* and position appropriately via Australian Standard markings
  - Note length at lips

**Immediately confirm placement with end-tidal respiratory waveform**

**Supplementary checks**
- Capnometry
- Rise and fall of chest
- Auscultation
- SpO₂

*If unable to obtain a Grade 1 or 2 view
- Consider “head, scope, throat”
- Problem-solve airway view by using additional head lift plus any combination of:
  - lip retraction
  - external laryngeal manipulation
  - jaw support/mouth opening
- If unable to improve airway view manage as per CPG P0302 Difficult Airway Guideline
Guideline Principles

- This guideline applies to all patients (< 12 years of age) undergoing medication assisted intubation. However, the principles may also be applied to unassisted intubation.
- RSI and cricothyroidotomy in paediatric patients are only authorised for MFPs.

Oxygenation

- A strategy for effective oxygenation and ventilation should be identified prior, during and post intubation.
- A critical desaturation threshold should be identified by the team. For the adequately oxygenated patient this may be defined as < 90%. In difficult to oxygenate patients this will be lower, but a critical threshold should still be verbalized.
- Rescue airway strategies should be used at any time during the procedure to correct critical desaturation.

Crew Resource Management

- Paediatric intubation, particularly those facilitated by medication, is a team-based procedure. Team roles, anticipated challenges and airway plan must be verbalized prior to commencement.
- Difficulties encountered during the procedure must be verbalised to the team to ensure a shared awareness and collaborative effort towards correction.

Plan A: OPTIMISED First intubation attempt

- First pass intubation is the goal of this guideline.
- The strategy of ‘Head-Scope-Throat’ is a rapid analysis of intubation difficulties and appropriate equipment selection. ‘Head-Scope-Throat’ should be performed when difficulties are encountered and/or between first and second attempt.
- Equipment selection is based on paramedic preference and clinical context (i.e. anatomy, airway complications). However it is recommended that Plan A should include the use of a bougie.

Plan B: ALTERNATIVE second intubation attempt

- A second intubation attempt must involve an alternative strategy that corrects identified issues.
- Alternative strategies should include the bougie and/or video laryngoscope (size appropriate) if not previously utilized.

Plan C: Rescue Airway Strategy

- If intubation is unsuccessful following two attempts, rescue airway strategies must be implemented with the key objective of achieving adequate oxygenation.
- The preferred airway rescue strategy is the SGA. However there may be clinical circumstances where reverting to two-handed BVM combined with basic airway adjuncts is appropriate.
- Sedation/paralysis should not be administered for the purpose of maintaining an SGA. This applies to...
Plan D: Can’t Intubate Cant Oxygenate (MFP only)

- A can’t intubate, can’t oxygenate (CICO) situation is a life-threatening emergency that requires cricothyroidotomy.
- While rare, in critical desaturation where the patient is deemed to be at immediate risk of arrest, moving directly to Plan D may be appropriate.
- Cricothyroidotomy is a primary airway method when intubation is deemed impossible, and other airway techniques (i.e. SGA and BVM) are not feasible or ineffective.
Care Objectives

- Optimise sedation +/- paralysis
- Optimise ventilation parameters using lung protective strategies

General notes

- Cervical collars should be placed on all intubated children over the age of 4 years where practicable.
- Insert bite block.
- Suction ETT and oropharynx
- Gastric decompression is especially important in paediatric patients. Children’s stomachs are easily inflated, insertion of an OG or NG tube may decrease splinting of the diaphragm and improve ventilation.
- To reduce the risk to tube dislodgement, consider disconnecting ETT circuit during transfer if clinically appropriate.
- Re-confirm tracheal placement following each movement.
- If electronic capnography fails, immediately confirm using colorimetric capnometry whilst troubleshooting occurs.
- Position patient in a 30° head-up semi-recumbent position if clinically appropriate
- Check cuff pressure and ensure 20 – 30 cmH₂O.
- Maintain normothermia.

Ventilation

- Settings:
  - Ventilate using 100% O₂
  - Tidal Volume of 5 - 10 mL/ kg
- Maintain:
  - SpO₂ > 95%
  - EtCO₂ at 30 - 35 mmHg
- EtCO₂ target may vary in the following patient cohorts:
  - **Asthma** - higher EtCO₂ may be appropriate permitted
  - **TCA OD** - maintain 20 - 25 mmHg
  - **DKA** - EtCO₂ should be maintained at the level detected immediately pre-intubation, with a maximum of 25 mmHg.

Sedation
Patients should be routinely given a loading dose of sedation prior to commencement of the infusion to ensure a therapeutic level is rapidly reached.

Consider separate Morphine and Midazolam infusions for specific presentations (e.g. pain-producing pathology or injuries, status epilepticus, etc.).

Signs of inadequate sedation include cough, gag or patient movement, HR and BP trending up together, lacrimation, diaphoresis, and hypersalivation.

**Paralysis**

- Post-intubation paralysis requires consultation with the receiving hospital or RCH.
- All patients who are paralysed require ongoing sedation.

**Infusions**

**Fentanyl + Midazolam Infusion (preferred)**

- **Fentanyl 300 mcg + Midazolam 15 mg in 15 mL D5W or Normal Saline**
  - 1 mL = 20 mcg Fentanyl + 1 mg Midazolam
  - 0.1 mL = 2 mcg Fentanyl + 0.1 mg Midazolam

**Morphine + Midazolam Infusion (Paediatric)**

- **Morphine 15 mg + Midazolam 15 mg in 15 mL D5W or Normal Saline**
  - 1 mL = 1 mg each drug
  - 0.1 mL = 0.1 mg each drug
  - 1 mL/hr = 1 mg/hr
Flowchart

Status
- Intubated
- SGA

Stop
- Tracheal placement must be continually monitored via electronic capnography and confirmed prior to administration of paralysis
- Ongoing paralysis is contraindicated in SGA

Assess
- Level of sedation / analgesia required
- Requirement for paralysis

Sedation

Action
- Fentanyl / Midazolam infusion 0.1 – 0.2 mL/kg/hr IV OR
- Morphine / Midazolam infusion 0.1 – 0.2 mL/kg/hr IV

Until sedation infusion established:
- Midazolam 0.1 mg/kg IV as required, AND
- Fentanyl 1 mcg/kg IV as required

Paralysis

Action
- Rocuronium 0.6 mg/kg IV every 15 minutes (consult only)
Care Objectives

- To reduce the suffering associated with the experience of pain to a degree that the patient is comfortable.

General Notes

- The adequacy of analgesia should be discussed, where possible, with the patient and balanced against medication side effects. The patient reporting comfort is the most important indicator of adequate analgesia. Distressed appearance, physiological signs of pain and verbal numerical rating may contribute to determining the adequacy of analgesia.

- An inability to report or rate pain (e.g., age, intellectual disability, non-English speaking) should not preclude analgesia. Where discomfort is evident in the setting of possible pain producing stimuli, strongly consider options for analgesia.

- **Fentanyl IN** is well established as a safe and effective analgesic, even in severe pain. Paramedics are encouraged to consult for further doses if the maximum dose has been reached but the patient remains in pain. It is the preferred option of RCH in most cases for ALS and MICA paramedics. Where it is insufficient in extreme traumatic pain consider Ketamine +/- IV opioids rather than IV opioids alone.

- Consider administering paracetamol in addition to opioids for moderate pain where the oral route is not contraindicated (e.g., possible emergency surgery or procedural sedation).

- The analgesic effect of morphine IM is slow and variable. In rare cases, consider **Morphine 0.1 mg/kg IM** (single dose only) as a last resort **ONLY** where unable to administer IN and the fentanyl IV route is unavailable. Unless the patient is heavier than their age-calculated weight, the maximum dose should not exceed 5 mg.

Procedural analgesia

- Procedural pain refers to any situation in which a patient requires supplemental analgesia for short periods of time. Methoxyflurane should not be used as a sole analgesic.

Quality analgesia

- Emergence reactions, hallucinations or other behavioural disturbances may occur with Ketamine administration and will usually respond to reassurance. Consult with RCH if further management options are required.

- Opioids/ketamine should be titrated to pain or side effects. In younger patients (1 – 2 years) adequate analgesia may be attained with a single dose of **Fentanyl IN**. If significant respiratory depression occurs due to opioid administration, manage as per CPG P0707 Overdose.

- Hypersalivation is a known side effect of ketamine. On most occasions suctioning will be sufficient. Where hypersalivation becomes difficult to manage or the airway is compromised, consult RCH for management options which may include administration of **Atropine** (MICA only).
### Paediatric paracetamol dose table

Paracetamol 15 mg/kg dose (based on 120 mg in 5mL liquid) CONFIRM DOSE WITH LABEL ON BOTTLE

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Weight (kg)</th>
<th>Dose (mg)</th>
<th>Volume (nearest mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 month</td>
<td>6</td>
<td>90</td>
<td>4</td>
</tr>
<tr>
<td>6 month</td>
<td>8</td>
<td>120</td>
<td>5</td>
</tr>
<tr>
<td>1 year</td>
<td>10</td>
<td>150</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>180</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>14</td>
<td>210</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>240</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>270</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>300</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>330</td>
<td>14</td>
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<td>8</td>
<td>24</td>
<td>360</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>26</td>
<td>390</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>33</td>
<td>495</td>
<td>21</td>
</tr>
<tr>
<td>11</td>
<td>36</td>
<td>540</td>
<td>23</td>
</tr>
</tbody>
</table>

NB. Children aged 10 - 11 can have a single 500mg tablet as an alternative to the liquid preparation depending on the patient preference.
Flowchart

Status
- Complaint or suspicion of pain

Assess
- Reported level of pain (using pain scale)
- Physical signs of discomfort (and document)
- Acute vs. chronic pain
- Analgesia already taken
- Opioid tolerance
- Co-morbidities

All patients
- Consider non-pharmacological management options as appropriate e.g. splinting, cold / heat therapy

Mild pain
✓ Action
If Pt or carer requests analgesia consider:
- Paracetamol 15 mg/kg oral if not already administered within past 4 hours
- If pain not controlled or rapid pain relief required, consider treating as per Moderate pain

Moderate pain
✓ Action
Fentanyl IN
- Small child (10 – 17 kg): 25 mcg IN
- Medium child (18 – 30 kg): 25 – 50 mcg IN
- Repeat initial dose at 5 – 10 minute intervals (consult after 3 doses)
- Consult with RCH for doses in children < 10 kg
- Consider Paracetamol as per Mild pain in combination with opioids
Unable to administer Fentanyl IN OR Moderate/severe procedural pain:
- Methoxyflurane 3 mL inhaled
  - Repeat 3 mL if required (max. 6 mL)

Severe pain
✓ Action
- Fentanyl IN +/- Methoxyflurane as per Moderate pain
- Consult for further doses of Fentanyl IN if required

Extreme traumatic pain persists despite opioid therapy:
- Consider Ketamine 0.25 mg/kg IV at 5 – 10 minute intervals (max. 0.5 mg/kg)
- Morphine 0.05 – 0.1 mg/kg IV
  - Repeat up to 0.05 mg/kg IV at 5 – 10 minute intervals
  - Max. 0.2 mg/kg without consultation
Patients with suspected epiglottitis can be difficult to identify, however should be considered time critical.

- In the patient presenting with stridor and increased work of breathing, drooling and an absence of cough are suggestive of epiglottitis (a cough and absence of drooling are more likely to indicate croup).
- Other reliable indicators of epiglottitis include a low pitched expiratory stridor (often snoring) and the patient preferring to sit in a ‘tripod’ or ‘sniffing’ position.
- Do not inspect the airway in patients with suspected epiglottitis due to the risk of precipitating respiratory arrest.

Flowchart
Decreased cough / stridor and increasing lethargy may be a sign of patient condition deteriorating and needs to be assessed carefully.

Nebulised Adrenaline for croup is indicated for children presenting with signs of hypoxia or those whose condition is deteriorating.

### RCH croup severity table

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stridor</td>
<td>Normal</td>
<td>Some/ intermittent irritability</td>
<td>Increasing irritability and/ or lethargy</td>
</tr>
<tr>
<td>Stridor</td>
<td>Barking cough. Stridor only when active or upset.</td>
<td>Some stridor at rest</td>
<td>Stridor present at rest</td>
</tr>
<tr>
<td>Respiratory Rate</td>
<td>Normal</td>
<td>Increased resp. rate Tracheal tug Nasal flaring</td>
<td>Marked increase or decrease in RR Tracheal Tug Nasal flaring</td>
</tr>
<tr>
<td>Accessory Muscle Use</td>
<td>None or minimal</td>
<td>Moderate chest wall retraction</td>
<td>Marked chest wall retraction</td>
</tr>
<tr>
<td>Oxygen</td>
<td>No oxygen requirement</td>
<td>No oxygen requirement</td>
<td>Hypoxaemia (late sign)</td>
</tr>
</tbody>
</table>
Flowchart: Croup

**Status**
- Croup / suspected croup

**Assess**
- Respiratory distress
- Cough / stridor

**Mild**
- **Action**
  - BLS
  - Rx as per Severe if Pt deteriorates

**Moderate**
- **Action**
  - Dexamethasone 600 mcg/kg Oral (Max. 12 mg)
  - Tx
  - Rx as Severe if Pt deteriorates

**Severe**
- **Action**
  - Either:
    - Increasing respiratory distress
    - Increasing lethargy
    - Decreasing stridor
  - Adrenaline 5 mg (5 mL) Nebulised (1:1,000)
  - Dexamethasone 600 mcg/kg Oral (Max 12 mg)

**If improved**
- **Action**
  - Continue to monitor Pt
  - Tx

**If unimproved**
- **Action**
  - Repeat Adrenaline as above at 5 minute intervals until improvement
  - Continue to monitor Pt
  - Tx

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Asthmatic patients are dynamic and can show initial improvement with treatment then deteriorate rapidly.

Consider MICA support but do not delay transport waiting for back up.

Despite hypoxaemia being a late sign of deterioration, pulse oximetry should be used throughout patient contact.

An improvement in SpO\textsubscript{2} may not be a sign of improvement in clinical condition.

Nebuliser masks require a minimum volume of fluid to operate correctly. For doses of nebulised \textit{Salbutamol} less than a single nebule, draw up appropriate volume of drug and dilute with normal saline to a minimum of 5 mL.

Caution should be used when administering nebulised \textit{Salbutamol} to children as it can cause profound lactic acidosis. Nebulised \textit{Salbutamol} should be reserved for severely ill children.

Children under 2 years of age should not be treated with nebulised \textit{Salbutamol} as it is unlikely to provide benefit.

When using pMDI use child’s own mask and spacer where available.

If an IV cannot immediately be inserted in the critically unwell child, obtaining IO access must not be delayed.

**Preparation of \textit{Adrenaline} infusion (syringe pump): \textit{Adrenaline 300 mcg} added to make 50 mL with 5% \textit{Dextrose} or \textit{Normal Saline}.

- \(1 \text{ mL} = 6 \text{ mcg}\)
- \(1 \text{ mL/hr} = 0.1 \text{ mcg/min}\)

At low flow rates in younger children an infusion may not be as effective as providing boluses. Clinical judgement should be applied as to the most effective route of administration.

A pMDI is the preferred route of administration for \textit{Salbutamol} in patients with mild or moderate respiratory distress. If a pMDI is not available, nebulise \textit{Salbutamol} as per Severe respiratory distress.

**Severity**

- Assess severity as follows. Vital signs can vary significantly depending on the age of the child.

\textbf{Mild/Moderate}: Normal conscious state, some increased work of breathing, tachycardia, speaking in phrases/ sentences.

\textbf{Severe}: Agitated/distressed, markedly increased work of breathing, including accessory muscle use/retraction, tachycardia, speaking in words.

\textbf{Critical}: Altered conscious state, maximal work of breathing, marked tachycardia, unable to talk.
Flowchart

**Asthma CPG P0602**

### Mild or Moderate
- **Action**
  - Salbutamol pMDI and spacer
  - > 6 years: Salbutamol 4 - 12 doses
  - 2 - 5 years: Salbutamol 2 - 6 doses
  - Pt to take 4 breaths for each dose
  - Repeat at 20 minute interval if required

### Severe
- **Action**
  - Nebulised Salbutamol
    - Small children (2 - 4 years):
      - Salbutamol 2.5 mg (1.25 mL) nebulised
    - Medium children (5 - 11 years):
      - Salbutamol 2.5 - 5 mg (1.25 - 2.5 mL) nebulised
    - Repeat Salbutamol at 20 minute interval if required
  - Ipratropium Bromide 250 mcg (1 mL) nebulised

### Critical
- **Action**
  - Nebulised Salbutamol
    - All children (2 - 11 years): Salbutamol 10 mg (5 mL) nebulised
    - Repeat Salbutamol at 5 minute intervals if required
  - Ipratropium Bromide 250 mcg (1 mL) nebulised
  - If unable to gain IV or unaccredited in IV Adrenaline:
    - Adrenaline 10 mcg/kg IM (1:1000)
    - Repeat at 5 - 10 minute intervals as required (max 30 mcg/kg IM)
  - Dexamethasone 600 mcg/kg IV/Oral (max 12 mg) (IV route for MICA only)
  - Adrenaline 10 mcg/kg IV/IO
    - Repeat 5 mcg/kg IV/IO at 3 minute intervals if required
  - If unimproved:
    - Adrenaline infusion 0.06 mcg/kg/minute
      - Titrate to response to maximum of 0.5 mcg/kg/minute

### Adequate response
- **Action**
  - Tx with continued reassessment
  - Repeat Salbutamol as necessary

### No significant response after 20 minutes
- **Action**
  - Rx as per Severe

---

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
High EtCO$_2$ levels should be anticipated in the intubated asthmatic patient. An EtCO$_2$ level of 120 mmHg in this setting is considered safe and when managing ventilation the Paramedic should be conscious of the effect of gas trapping when attempting to reduce EtCO$_2$.

Extreme care must be taken with assisted ventilation as gas trapping and barotrauma occurs easily in asthmatic patients with already high airway pressures. Give early consideration to bilateral chest decompression in the manually ventilated asthma patient.

If a mechanical ventilator is not available it can be difficult to assess tidal volume during manual ventilation. In this setting all paediatric patients should be ventilated with sufficient pressure and volume to achieve visible rise and fall of the chest.
General Notes

- Consider potential for TPT and manage as per CPG P0802 Chest Injuries (Paediatric).
- Due to high intrathoracic pressure as a result of gas trapping, venous return is impaired and C.O. may be lost. Apnoea allows the gas trapping to decrease.
- The patient receiving APPV is at higher risk of this occurring and should be monitored closely.

Flowchart
The main focus in paediatric nausea and vomiting is oral rehydration.

If nausea and vomiting is being tolerated, basic care and transport is the only required treatment.

Intravenous fluid replacement is intended for the patient in shock.

Undifferentiated nausea and vomiting may include but is not limited to:

- secondary to opioid analgesia
- secondary to cytotoxic drugs or radiotherapy
- severe gastroenteritis

**Flowchart**

- **Status**: Actual or potential for nausea and vomiting
- **Assess**: Nausea and vomiting, or
  - Potential spinal injury
  - Potential eye trauma
- **Undifferentiated nausea and vomiting**
  - **Action**: Ondansetron ODT orally
    - Small child – 2 mg
    - Medium child – 4 mg
  - If IV insitu / indicated:
    - Ondansetron 0.1 mg/kg IV (up to 4 mg, no repeat dose)
- **Prophylaxis for**
  - Awake Pt (GCS 13-15) with potential spinal injuries and immobilised
  - Eye trauma – e.g. penetrating eye injury or hyphema
  - **Action**: Ondansetron ODT orally
    - Small child – 2 mg
    - Medium child – 4 mg
Normalisation of blood glucose level

Intended patient group
- All paediatric patients

Management
- Patient may be aggressive during management.
- Ensure IV is patent before administering Dextrose. Extravasation of Dextrose can cause tissue necrosis.
- All IVs should be well flushed before and after Dextrose administration (minimum 10 mL Normal Saline).
- The median time to restoration of normal conscious state after the administration of Dextrose IV can vary from 5 to 15 minutes. A slow response exceeding 15 minutes can also occur occasionally. When considering additional doses of Dextrose IV, it is appropriate to reassess both conscious state and BGL.
- If BGL has returned to normal but the Pt remains altered conscious, consider concomitant illness (e.g. sepsis, head injury, trauma) and transport without undue delay.
- Further doses of Dextrose 10% IV may be required in some severe hypoglycaemic episodes. Consider consultation if BGL remains less than 4 mmol/L despite Dextrose 10% IV 500 mg/kg and unable to administer oral carbohydrates.
- Consult early for Dextrose 10% IV in the setting of an insulin overdose even if BGL > 4 mmol/L and/or patient obeying commands.
- If next meal is more than 20 minutes away, encourage patient to eat a long acting carbohydrate (e.g. sandwich, fruit, glass of milk) to sustain BGL until next meal.
- If adequate response, maintain initial management and transport.
- Maintain general care of unconscious patient and ensure adequate airway and ventilation.

Refusal of transport
- If the patient or legal guardian refuses transport, repeat the advice for transport. If patient still refuses transport, document the refusal and leave patient with a responsible guardian. Advise the guardian of actions to take if symptoms recur and of the need to make early contact with LMO for follow up.
Flowchart

**Status**
- Evidence of possible hypoglycaemia
  - e.g. diabetic, altered conscious state, agitation, pale, diaphoretic

**Assess**
- BGL
- Conscious state assessment

**BGL 4 – 11**
- **Action**
  - Consider other causes, e.g.
    - Stroke
    - Seizure
    - Hypovolaemia

**BGL < 4 Responding to commands**
- **Action**
  - Glucose 15 g oral
    - If inadequate response after 15 min:
      - Consider repeat Glucose 15 g oral
        - titrated to response (max. 30 g) or
      - Glucagon IM
    - Consider Dextrose IV

**BGL < 4 Not responding to commands**
- **Action**
  - If not accredited in IV Dextrose or unable to obtain IV access
    - < 25 kg: Glucagon 0.5 IU (0.5 mL) IM
    - ≥ 25 kg: Glucagon 1 IU (1 mL) IM
  - IV cannula in large vein

**Confirm IV patency**
- Dextrose 10% 300 mg/kg (3 mL/kg) IV
  - Normal Saline 10 mL flush
- If GCS or BGL not returned to normal after 5–10 min:
  - Dextrose 10% 200 mg/kg (2 mL/kg) IV titrating to effect
Care Objectives

- Adequate fluid replacement where indicated

General Notes

Intended patient group

- All paediatric patients

Diabetic ketoacidosis (DKA)

- Any patient with
  - a pre-existing history of diabetes
  - BGL > 11 mmol/L, and
  - clinical features of DKA (e.g. confusion, signs of dehydration, Kussmaul’s breathing) should be transported to hospital for further investigation.

- Approximately one half of diabetic ketoacidosis (DKA) cases will present with low to moderate hyperglycaemia (11-29 mmol/L).

- Occasionally, DKA will occur in paediatric patients without previously diagnosed diabetes. Paramedics should be vigilant to assess BGL in paediatric patients with signs or symptoms of hyperglycaemia or unexplained illness.

- Kussmaul’s breathing can often be confused for hyperventilation related to anxiety. Any patient with a BGL > 11 mmol/L, clinical signs of dehydration and hyperventilation requires further investigation in hospital.

- Clinical features alone may not be sufficient to differentiate between DKA and a Hyperosmolar Hyperglycaemic State (HHS).

Hyperosmolar Hyperglycaemic State (HHS)

- Patients with HHS are
  - typically older
  - have higher BGL readings (> 30mmol/L)
  - and usually do not present with clinical features of DKA (e.g. Kussmaul’s breathing).

- HHS is unlikely in paediatric patients.

Management

- There is no value in differentiating between hyperglycaemic crises in the prehospital setting. Adequate fluid replacement in patients with less than adequate perfusion should be aim of care in symptomatic patients.

- Paediatric patients with DKA/HHS who are adequately perfused do not require bolus doses of Normal Saline in the prehospital setting.

- Patients should not be encouraged to self-administer additional doses of insulin prior to transport to
hospital.

**Intubation**

- Removing the patient’s ability to achieve compensatory respiratory alkalosis (i.e. Kussmaul’s respirations) can lead to poorer outcomes in DKA patients. As such, endotracheal intubation should be avoided except in cases where the patient is severely obtunded.
Flowchart

**Status**
- Evidence of possible hyperglycaemia, e.g.
  - Confusion
  - Dehydration
  - Tachypnoea
  - Polydipsia
  - Polyuria
  - Kussmaul's breathing

**Assess**
- BGL
- Perfusion status assessment

**BGL 4 – 11**
- Consider other causes, e.g.
  - Dehydration
  - Sepsis
  - Metabolic disorders

**BGL >11**
- Less than adequate perfusion AND
- Clinical features of DKA/HHS, e.g.
  - Confusion
  - Dehydration
  - Tachypnoea
  - Polydipsia
  - Polyuria
  - Kussmaul's breathing
  - Hx diabetes
- Consider antiemetic as per CPG P0701 Nausea and Vomiting
  - Normal Saline 10 mL/kg IV titrated to perfusion status
    - Consult with RCH if further doses are required to maintain adequate perfusion

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
For the purposes of this CPG, Status Epilepticus (SE) refers to either ≥ 5 minutes of continuous seizure activity OR multiple seizures without full recovery of consciousness (i.e. back to baseline) between seizures.

Generalised Convulsive Status Epilepticus (GCSE) is characterised by generalised tonic-clonic movements of the extremities with altered conscious state.

Subtle SE may develop from prolonged or uncontrolled GCSE and is characterised by coma and ongoing electrographical seizure activity with or without subtle convulsive movements (e.g. rhythmic muscle twitches or tonic eye deviation). Subtle SE is difficult to diagnose in the pre-hospital environment but should be considered in patients who are witnessed to have generalised tonic-clonic convulsions initially and present with ongoing coma with no improvement in conscious state (with or without subtle convulsive movements).

For seizures other than GCSE, Midazolam may only be administered following consultation via the Clinician.

Some patients may be prescribed buccal / intranasal midazolam or rectal diazepam to manage seizures.

If a single seizure has spontaneously terminated continue with initial management and transport.

If patient has a past history of seizures and refuses transport, they may be left in the care of a responsible third party. Advise the person of the actions to take for immediate continuing care if symptoms recur, and the importance of early contact with their primary care physician for follow up.

### Midazolam Dosage Chart

<table>
<thead>
<tr>
<th>Age</th>
<th>Newborn</th>
<th>Infant &lt;1</th>
<th>Small Child 1-4</th>
<th>Medium Child 5-11</th>
<th>Yrs</th>
<th>Weight</th>
<th>Midazolam (IM) 5 mg/1 mL (0.2 mL = 1 mg)</th>
<th>Midazolam (IV) 15 mg/15 mL (1 mL = 1 mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 5</td>
<td>5 - 9</td>
<td>10 - 17</td>
<td>18 - 39</td>
<td>kg</td>
<td>kg</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
<td>1</td>
<td>2.5</td>
<td>2.5 - 5</td>
<td>mg</td>
<td>mg</td>
<td>1 mL syringe</td>
<td>1 mL syringe</td>
</tr>
<tr>
<td></td>
<td>0.2</td>
<td>0.5</td>
<td>1</td>
<td>1 - 2</td>
<td>mL</td>
<td>mL</td>
<td>Add 3 mL (15 mg) Midazolam (from 15 mg in 3 mL ampoule) to 12 mL Normal Saline in a 20 mL syringe</td>
<td>Add 3 mL (15 mg) Midazolam (from 15 mg in 3 mL ampoule) to 12 mL Normal Saline in a 20 mL syringe</td>
</tr>
</tbody>
</table>
Flowchart

**Status**
- Seizure activity

**Assess / manage**
- Evidence of Status Epilepticus (≥ 5 minutes or ≥ 2 seizures without recovery)
  - GCS or other SE (including subtle SE)
  - Consider other causes e.g. hypoglycaemia, hypoxia, head trauma, stroke / ICH, electrolyte disturbance, meningitis
  - Consider Pt’s own Mx plan and Rx already given

**Seizure activity ceased / Other SE / Subtle SE**
- **Action**
  - BLS
  - Continue to monitor airway, ventilation, conscious state and BP
  - If subtle SE suspected, consider time-critical transport to hospital and consult Clinician for Midazolam IM

**Generalised Convulsive SE**
- **Action**
  - Mx airway and ventilation as required
  - If intubated patient, administer high-flow O2
  - Midazolam IM
    - Medium Child (6 - 11 years) Midazolam 2 - 5 mg IM
    - Small child (1 - 4 years) Midazolam 2.5 mg IM
    - Small & Large Infant (< 12 months) Midazolam 1 mg IM
    - Newborn Midazolam 0.5 mg IM
  - Continue to monitor airway, ventilation, conscious state and BP

**Seizure activity continues > 5 minutes**
- **Action**
  - IV access
  - Midazolam IV
    - Medium Child (6 - 11 years) Midazolam 1 - 2 mg IV
    - Small child (1 - 4 years) Midazolam 1 mg IV
    - Small & Large Infant (< 12 months) Midazolam 0.5 mg IV
    - Newborn Midazolam 0.2 mg IV
  - Repeat original dose IV at 2 - 5 minute intervals as required
    - Max. of 5 doses in total (IM + IV)
  - Consult for further doses
  - Consider intubation as per CPG P0031 Endotracheal Intubation

**Seizure activity continues > 10 minutes**
- **Action**
  - No IV access/creditation
  - Repeat original Midazolam IM dose once only
  - Consult for further doses
  - Continue to monitor airway, ventilation, conscious state and BP
Anaphylaxis

General Notes

- Signs of allergy include a range of cutaneous manifestations and/or a history of allergen exposure. This history can include food, bites/stings, medications or the allergen can be unknown.

- In rare circumstances anaphylaxis can occur with symptoms in an isolated body system. If a patient has hypotension relative to age (as per CPG P0101) following exposure to a known allergen for them consider treating as per anaphylaxis.

- International guidelines recommend IM administration of Adrenaline to the anterolateral mid-thigh as the preferred site due to improved absorption. Whilst remaining alert to patient comfort and dignity issues, the mid-lateral thigh should be considered the preferred site of administration where possible.

- IV Adrenaline should be reserved for the patient who is extremely poorly perfused or facing impending cardiac arrest.

- IV Adrenaline should be subsequent to IM Adrenaline in all cases with an initial IM therapy option selected for every anaphylaxis patient regardless of presentation.

- IV Adrenaline should preferably be administered via a syringe pump infusion where possible.

- For patients persistently unresponsive to Adrenaline (especially if taking beta blocking medication) the administration of Glucagon 20-30 mcg / kg (max 1 mg) IV can be considered under consultation. Glucagon administration must not delay further Adrenaline administration.

- Anaphylaxis can be difficult to identify. Cutaneous features are common though not mandatory. Irrespective of known allergen exposure, if 2 systemic manifestations are observed then anaphylaxis should be accepted.

- Deaths from anaphylaxis are far more likely to be associated with delays in management rather than due to inadvertent administration of Adrenaline.

- All patients with suspected anaphylaxis must be advised that they should be transported to hospital regardless of the severity of their presentation or response to management. International guidelines recommend at least 4 hours of observation following treatment.

- Different brands of self-administered adrenaline autoinjectors will deliver different doses of adrenaline. In the absence of Paramedic intervention, an auto-injector is an appropriate treatment.

- Nebulised pharmacotherapy may be of benefit in management of anaphylaxis however should always be secondary therapy. Salbutamol may be of use for persistent bronchospasm and Adrenaline may be of use for persistent upper airway oedema and stridor.

- Where poor perfusion persists despite initial Adrenaline therapy, large volumes of fluid may be extravasating. IV fluid therapy is indicated to support vasopressor administration.

Infusion preparation

Preparation of Adrenaline infusion (syringe pump): Adrenaline 300 mcg added to make 50 mL with 5% Dextrose or Normal Saline

1 mL = 6 mcg
1 mL/hr = 0.1 mcg/min

At low flow rates in younger children an infusion may not be as effective as providing boluses. Clinical judgement should be applied regarding the most effective route of administration.
Meningococcal Septicaemia

General Notes

- A typical purpuric rash may be subtle in some cases and present as a single ‘spot’ only.
- The presence of rapid onset symptoms of sepsis +/- rash may be a sign of meningococcal septicaemia.
- Meningococcal is transmitted by close personal exposure to airway secretions / droplets.
- Ensure face mask protection especially during intubation / suctioning.
- Ensure medical follow up for staff post exposure.
- Consider consultation where diagnosis is uncertain.

Ceftriaxone preparation

- Dilute Ceftriaxone 1 g with 9.5 mL of Water for Injection and administer 50 mg/kg IV over approximately 2 minutes (NB 1 mL = 100 mg).
- If unable to obtain IV access, or not accredited in IV cannulation, dilute Ceftriaxone 1 g with 3.5 mL 1% Lignocaine HCL and administer 50 mg/kg IM into the upper lateral thigh (NB 1 mL = 250 mg).

Paediatric Chart

<table>
<thead>
<tr>
<th>Age/ Years</th>
<th>0</th>
<th>3 Mth</th>
<th>6 Mth</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>3.5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>24</td>
<td>26</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
<td>Ceftriaxone (IM)</td>
<td>50 mg/kg</td>
<td>0.7</td>
<td>1.2</td>
<td>1.6</td>
<td>2</td>
<td>2.4</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1 g diluted with 3.5 mL 1% Lignocaine (1 mL = 250 mg)</td>
<td>1 mL syringe</td>
<td>175</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>900</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5 mL syringe</td>
<td>2.8</td>
<td>3.2</td>
<td>3.6</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 mL syringe</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

| Ceftriaxone (IV) | 50 mg/kg | 1.75 | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 10 | 10 | 10 | 10 |
| 1 g diluted with 9.5 mL Water for Injection (1 mL = 100 mg) | mL | 175 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1000 | 1000 | 1000 |
| | 10 mL syringe | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
### Flowchart

**Status**
- Possible meningococcal septicaemia

**PPE**

**Confirm meningococcal septicaemia**
- Typical purpuric rash
- Septicaemia signs
  - Fever, rigor, joint and muscle pain
  - Cool hands and feet
  - Tachycardia, hypotension
  - Tachypnoea
- Meningeal signs
  - Headache, photophobia, neck stiffness
  - Nausea and vomiting
  - Altered consciousness
  - Irritable or whimpering

**IV Access**
- **Action**
  - **Ceftriaxone 50 mg/kg IV (max. 1000 mg)**
    - Dilute 1000 mg to 10 mL with Water for Injection
    - Administer slowly over 2 minutes

**No IV Access**
- **Action**
  - **Ceftriaxone 50 mg/kg IM (max. 1000 mg)**
    - Dilute 1000 mg with 3.5 mL Lignocaine 1%
    - Administer into upper lateral thigh

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
General Notes

- Provide supportive care (in all cases)
  - Provide appropriate airway management and ventilatory support.
  - If patient is in an altered conscious state, assess BGL and if necessary manage as per CPG P0702 Hypoglycaemia (Paediatric).
  - If patient is inadequately perfused, manage as per CPG P0801 Hypovolaemia (Paediatric) in cases other than TCA OD.
  - Assess patient temperature and manage as per CPG P0901 Hypothermia / Cold exposure (Paediatric), or CPG P0902 Environmental Hyperthermia / Heat Stress (Paediatric).

- Confirm clinical evidence of substance use or exposure
  - Identify which substance/s are involved and collect evidence if possible.
  - Identify by which route the substance/s have been taken (e.g. ingestion).
  - Establish the time the substance/s were taken.
  - Establish the amount of substance/s taken.
  - What were the substance/s mixed with when taken (e.g. alcohol, water)?
  - What treatment has been initiated prior to ambulance arrival (e.g. induced vomiting)?

- If patient claims to have taken an overdose of a potentially life-threatening substance then they must be transported to hospital. Police assistance should be sought to facilitate this as required.

When dealing with cases of overdose, if Paramedics are unfamiliar with a substance or unsure of the effects it may have, then consultation with Poisons Information should take place. Poisons Information can be contacted via the Clinician, or on 13 11 26.
Opioids may be in the form of IV preparations such as Heroin or Morphine and oral preparations such as Codeine, Endone, MS Contin. Some of these drugs also come as suppositories and topical patches.

Not all opioid overdoses are from IV administration of the drug.

If inadequate response after 10 minutes patient is likely to require transport without delay.
- Maintain general care of the unconscious patient including airway management and supported ventilations if required.
- Consider other causes e.g. head injury, hypoglycaemia or polypharmacy overdose.
- Beware of patient becoming aggressive.

Flowchart

- **Status**
  - Possible opioid OD

- **Stop**
  - Ensure personal / crew safety
  - Scene may have concealed syringes

- **Assess evidence of opioid OD**
  - Exclude other causes of altered consciousness
  - Confirm clinical signs of opioid OD
  - Assess most likely substance(s) involved

- **Opioid OD**
  - Action
    - Assist and maintain airway / ventilation
    - Naloxone 10 mcg/kg (max. 400 mcg) IM

- **Adequate response**
  - Action
    - BLS

- **Inadequate response after 10 minutes**
  - Action
    - Repeat Naloxone 10 mcg/kg (max. 400 mcg) IM
    - Naloxone 10 mcg/kg (max. 400 mcg) IM or IV
    - Consider airway Mx
      - CPG P0301 Endotracheal Intubation
    - Consult with receiving hospital for further doses of Naloxone
For patients who refuse transport, repeat the advice for transport using friend/relative assistance. If patient still refuses transport advise the patient and responsible third person of follow up options, counselling services and actions to take for immediate continuing care if symptoms recur.

For young persons, Paramedics should strongly encourage them to make contact with a responsible adult.

Paramedics should contact Police if in their professional opinion the patient appears to be a victim of or at increased risk of:
- Family violence (e.g. from a parent, guardian or care giver).
- Sexual exploitation or abuse.
- Or if:
  - The supply of drugs appears to be from a parent/guardian/caregiver.
  - There is other evidence of child abuse/maltreatment or evidence of serious untreated injuries.

If patient claims to have taken an overdose of a potentially life-threatening substance then they must be transported to hospital. Police assistance should be sought to facilitate this as required.

Documentation of refusal and actions taken must be recorded on the PCR.

If the Police are contacted, they will notify the Department of Human Services (DHS) Child Protection if they believe the young person is in need of protection.

If a young person makes it known they are involved with DHS Child Protection and they give permission, an attempt should be made on their behalf to contact the young person's Child Protection practitioner, Region or Child Protection After Hours Service (24 hours on 131 278) to advise of the ambulance attendance and treatment. The intent is to make arrangements for ongoing care for this patient. Such contact is best made through the Clinician in the operations/communications centre.
Flowchart

**Status**
- Sedative agents
- Psychostimulants

**Assess**
- Substances involved

**Sedative agents**
- **Action**
  - Be aware of the potential for agitation / aggression particularly in GHB / volatile substance abuse
  - Pt may require airway Mx
  - Mx agitation / aggression as per CPG A0708

  **Agitation**
  - Children up to 11 years will be Mx in accordance with the adult CPG if sedation is required (consult only)

**Psychostimulants**
- **Action**
  - Be aware of the potential for violent behaviour particularly with methamphetamine
  - Reduce stimulus by calming and controlling Pt environment
  - Mx seizures as per CPG P0703 Seizures (Paediatric)
  - Mx temp as per CPG P0901 Hypothermia / Cold Exposure (Paediatric) or CPG P0902 Environmental Hyperthermia / Heat Stress (Paediatric)
  - Mx agitation / aggression as per CPG A0706 Agitation
Signs and symptoms of TCA toxicity

- Mild to moderate OD
  - Drowsiness, confusion
  - Tachycardia
  - Slurred speech
  - Hyperreflexia
  - Ataxia
  - Mild hypertension
  - Dry mucus membranes
  - Respiratory depression

- Severe toxicity (within 6 hours ingestion)
  - Coma
  - Respiratory depression / hypoventilation
  - Conduction delays
  - PVCs
  - SVT
  - VT
  - Hypotension
  - Seizures
  - ECG changes

This could lead to aspiration, hyperthermia, rhabdomyolysis and APO.

ECG Changes

ECG changes include prolonged PR, QRS and QT intervals associated with an increased risk of seizures if QRS > 0.10 seconds and ventricular arrhythmias if QRS > 0.16 seconds.

TCAs may be prescribed to treat medical conditions other than depression (e.g. chronic pain).
Flowchart

**Status**
- Possible TCA OD

**Assess**
- Substance involved
- Perfusion status
- ECG criteria

**No toxicity**
- **Action**
  - BLS
  - Consider potential to develop signs of toxicity

**Signs of TCA toxicity**
- Any of the following:
  - QRS > 0.12 sec
  - Hypotension
  - Ventricular arrhythmias

**Stop**
- **Amiodarone** is C/I in the setting of confirmed or suspected TCA OD

- **Action**
  - **Sodium Bicarbonate 8.4% 2 mL/kg IV over 3 minutes**
    - Repeat 2 mL/kg IV after 10 minutes if signs of toxicity persist
    - Severe cases may require continuing doses
    - Consult RCH or receiving hospital
  - Consider ETT as per **CPG P0301 Endotracheal Intubation**
    - Hyperventilate relative to age with 100% O₂
    - ETCO₂ target 20 - 25 mmHg if intubated
Notify the receiving hospital as patient isolation is essential.

The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used not only commercially but also domestically.

If a potential contamination by a possible organophosphate has occurred, the container identifying trade and generic names should be located and the Poisons Information Centre contacted for confirmation and advice via the Clinician, or on 13 11 26.

In symptomatic cases, MICA Paramedics should consider calling for extra MICA support early as imprest levels of Atropine may be quickly exhausted if scene times or transport times are prolonged.

Where possible, remove contaminated clothing and wash skin thoroughly with soap and water.

Minimise the number of staff exposed.

Attempt to minimise transfers between vehicles in order to reduce risk of vehicle or equipment contamination and staff exposure.
General Notes

- Modifying factors must be considered and managed prior to aggressive fluid therapy.
- Always consider the possibility of TPT in the patient with persistent hypotension unresponsive to fluid therapy, in the setting of a chest injury.
- Excessive fluid should not be given if SCI is an isolated injury.
- If IV access is unable to be obtained and the patient is obtunded, insert IO.
- Provide pain relief as per CPG P0501 Pain Relief (Paediatric).

Modifying factors

- Patients with isolated neurogenic shock can be given up to 5 mL/kg Normal Saline IV bolus to correct hypotension.
- Chest injury - Consider TPT and manage as per CPG P0802 Chest Injury (Paediatric).
- Penetrating trunk injury or uncontrolled haemorrhage
  - accept palpable carotid pulse and transport immediately. Consider IV access en route to hospital.
Chest Injuries

Care Objectives

• To identify and manage time critical chest injuries such as tension pneumothorax

General Notes

Flail segment / rib fractures

• Pain associated with rib fractures may lead to hypoventilation. In these instances, prioritise careful titration of analgesia.

TPT in the awake / spontaneously ventilating patient

• Patients with generic signs and symptoms of pneumothorax are not indicated for decompression. Paramedics should closely monitor the patient for deterioration.

• TPT is highly likely in the patient with generic symptoms of pneumothorax AND subsequent deterioration in respiratory status and/or conscious state. Decompression is indicated in these patients.

• Hypotension is a late sign in the spontaneously ventilating patient. MICA paramedics should not wait for a drop in BP prior to decompression.

TPT in the ventilated patient

• TPT in the ventilated patient is more likely to develop rapidly, with a sudden decrease in SpO\textsubscript{2} and BP.

• Chest injury patients receiving IPPV have a high risk of developing a TPT. Bilateral chest decompression is appropriate prior to managing decreased perfusion.

• Equal air entry is NOT an exclusion criterion for TPT.

• Cardiac arrest patients are at risk of developing chest injury during CPR.

Chest decompression

• Insertion site for cannula/intercostal catheter (SMART):
  – Second intercostal space
  – Mid - clavicular line (avoiding medial placement)
  – Above rib below (avoiding neurovascular bundle)
  – Right angles to chest
  – Towards body of vertebrae

• Insert a 14g or 16g cannula depending on patient size.

• If air escapes, or air and blood bubble through the cannula, or no air / blood detected, leave in situ and secure.

• If no air escapes but copious blood flows through the cannula then a major haemothorax is present. Remove the cannula and cover the insertion site.

• Catheter troubleshooting:
Patient may re-tension as lung inflates if catheter kinks off
- Catheter may also clot off. Flush with sterile Normal Saline

Local anaesthesia for GCS > 10
- Consult with RCH if local anaesthetic is required for chest decompression in the conscious paediatric patient.

Flowchart: Chest Injuries - General

- Status
  - Chest injury
    - traumatic
    - spontaneous
    - iatrogenic

- Assess
  - Respiratory status
  - Type of chest injury

- Action
  - Supplemental $O_2$
  - Pain relief as per CPG P0501 Pain Relief (Paediatric)
  - Position Pt upright if possible unless perfusion is < adequate, altered conscious state, associated barotrauma or potential spinal injury

- Flail segment/rib fractures
  - Action
    - May require ventilatory support if decreased $V_t$

- Open chest wound
  - Action
    - Do not occlude open pneumothorax
    - Appropriate dressing only if required for haemorrhage

- Pneumothorax
  - Action
    - See CPG P0802 Chest injuries – Tension Pneumothorax
Flowchart: Chest Injuries - Tension Pneumothorax

**Status**
- Chest trauma
- Ventilated patient
- Suspected spontaneous pneumothorax

**Assess**
- Criteria for simple pneumothorax vs tension pneumothorax

**Simple pneumothorax**
- Any of the following:
  - Unequal breath sounds in spontaneously ventilating Pt
  - SpO₂ <92% on room air
  - Subcutaneous emphysema
- Ensure Mx as per Chest Injuries - General
- Monitor closely for possible development of TPT

**TPT**
- Any of the following +/- signs of Simple pneumothorax:
  - Respiratory distress in the awake Pt
  - SpO₂ to <92% despite O₂
  - Conscious state
  - Poor perfusion or ↑ HR +/- ↓ BP
  - Peak inspiratory pressure (ventilator) / stiff bag
  - ↑ EtCO₂
  - ↑ JVP
  - Tracheal shift
  - Low SpO₂ on O₂ (late sign)

**Cardiac arrest imminent**
- Immediate chest decompression as per general care

**Cardiac arrest NOT imminent**
- Monitor closely for deterioration
  - GCS > 10 consult with RCH for Lignocaine 1% local anaesthetic infiltration and decompress as per general care

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Care Objectives

- To identify and manage potential airway burns as a priority
- To minimise the impact of injury by maintaining tissue and organ perfusion, minimising pain, appropriate burn wound cooling and minimising heat loss during transfer to hospital.

General Notes

- Signs and symptoms of airway burns include:
  - Evidence of burns to upper torso, neck and face
  - Facial and upper airway oedema
  - Sooty sputum
  - Burns that occurred in an enclosed space
  - Singed facial hair (nasal hair, eyebrows, eyelashes, beards)
  - Respiratory distress (dyspnoea +/- wheeze and associated tachycardia, stridor)
  - Hypoxia (restlessness, irritability, cyanosis, decreased GCS)

- Patients who receive intubation and paralysis are at increased risk of hypothermia. Once a long term paralytic is administered, temperature management becomes a more significant priority.

- Volume replacement is calculated for the burn injury only. Manage other injuries accordingly including the requirement for additional fluid.

- Electrical burns are at increased risk of acute kidney injury secondary to profound muscle damage and may require extra fluid.

- PIPER can be contacted via the Clinician or on 1300 137 650. They should be notified in all cases of suspected airway burns or if TBSA > 10% and the patient is not being transported directly to RCH.

Burn Cooling

- Burn cooling should ideally be undertaken for 20 minutes. Stop cooling if the patient begins shivering or has a temperature ≤35°C. Cooling provided prior to AV arrival should be included in the timeframe.

- Cool with gentle running water between 5 – 15°C where available. Ice and iced water is not desirable. Dirty (e.g. dam) water should be avoided due to contamination and risk of infection.

- If running water is not available, cooling may be achieved by immersing the injury in still water, using a spray bottle or applying moist towels.

- Whilst being mindful of temperature management, chemical burns should be irrigated for as long as pain persists. Avoid washing chemicals onto unaffected areas, especially eyes.

- Remove burnt clothing or clothing containing chemicals or hot liquid when safe to do so. Do not remove any matter that is adhered to underlying tissue. Remove jewellery prior to swelling occurring.

Minimise heat loss

- Maintaining normothermia is vital. Assess temperature as soon as practicable. Protect the patient from heat loss where possible.
Elevate

- If clinically appropriate, elevation of the affected area during transport will minimise swelling and oedema, especially in circumferential burns.

Dressing

- Cling wrap is an appropriate burns dressing and is preferred for all burns. It should be applied longitudinally to allow for swelling.

Transport

- All burns patients who meet the time critical trauma criteria (> 10% TBSA, suspected airway burns, > 1000 volt electrical burns) should be transported to the Royal Children’s Hospital as a preference, if within 45 minutes transport time. If transport time > 45 minutes, transport to the nearest alternative highest level of trauma service.

- Any burns involving the face, hands, feet, genitalia, major joints, or circumferential burns of the chest or limbs are recommended for assessment by a major burns service. These patients may not require direct transport to the Royal Children’s Hospital if distance is prohibitive, as it may be via telemedicine or secondary transfer.

- In all cases of prolonged transport times, consider alternative air transport.

- In all cases of significant burn injury – whether due to % TBSA or location of injury – consider consultation with PIPER for further management, appropriate destination and hospital notification.
Flowchart

**Status**
- Evidence of burn injury

**Stop**
- **Paramedic safety is paramount**
- Ensure safety and removal from burn mechanism
- Avoid chemical contamination

**Assess mechanism of burn and burn injury**
- Signs/symptoms of airway burns
- Mechanism of injury
- Severity of injury (%TBSA, estimated depth, other injuries, comorbidities)

**Suspected Airway Burns**
- **Action**
  - If suspected airway burns, early involvement of senior airway expertise via AAV and/or PIPER is essential

**Partial or full thickness burns > 10% TBSA**
- **Action**
  - Normal Saline - 3 X % TBSA x Pt wt (kg) = vol (mL)
    - Given over 24 hours from time of burn
    - Administer half of the 24-hour fluid volume over the first 8 hours

**All burns**
- **Action**
  - Rx pain as per CPG P0501
  - Pain Relief
  - Cool the burn
    - warm the patient
  - Apply appropriate dressing
  - Tx to an appropriate facility

If resources allow manage concurrently
Paediatric - Adult Burns Assessment Ruler

**Special Notes**

**Paediatric-Adult Burns Assessment Ruler**

Expressed as a % of Total Body Surface Area

<table>
<thead>
<tr>
<th>1 yr</th>
<th>2 yr</th>
<th>3 yr</th>
<th>4 yr</th>
<th>5 yr</th>
<th>6 yr</th>
<th>7 yr</th>
<th>8 yr</th>
<th>9 yr</th>
<th>10 yr - Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
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</tbody>
</table>

Chest + Abdomen = 18% Front or 18% Back

Limbs are measured circumferentially

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**Care Objectives**

- To identify and appropriately manage hypothermic patients
- To minimise the risk of major trauma patients becoming hypothermic

**General Notes**

**Intended patient group**

- All paediatric patients

**Classification**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>32 – 35°C</td>
</tr>
<tr>
<td>Moderate</td>
<td>28 – 32°C</td>
</tr>
<tr>
<td>Severe</td>
<td>&lt; 28°C</td>
</tr>
</tbody>
</table>

**Assessment**

- Hypothermia is insidious and rarely occurs in isolation if the patient is part of a group.
- Frail patients are at increased risk group for suffering hypothermia and this should be considered when assessing them, irrespective of the initial complaint.
- Potential major trauma patients should receive thermal management under this guideline, irrespective of their temperature.

**Cardiac arrhythmias**

- Associated with temperatures < 33°C.
- Gentle handling of the patient is essential to avoid stimulating lethal arrhythmias.
- Atrial arrhythmias, bradycardias or A-V blocks will generally resolve on rewarming and this should be the focus of treatment. If the patient has a profound bradycardia and an altered conscious state despite all attempts at rewarming being made, consult for further management.
- Defibrillation and cardioactive medications may not be effective at temperatures < 30°C. VF may resolve spontaneously upon rewarming.

**Management**

**All patients**

- The target temperature for the patient compartment of the ambulance for patients suffering or at risk of hypothermia is 24°C or higher.
- If a patient has wet clothes on they must be removed, the patient dried and then thermally protected. If a patient has dry clothes on, they should only be removed if required to assess and treat injuries.
- Where IV fluid is indicated it should be delivered via a fluid warmer if available.
• Bags of IV fluid are **not** to be warmed in a microwave and either administered to a patient, or used as a hot water bottle.

**Cardiac arrest**

• The onset and duration of medications is prolonged during hypothermia. In cardiac arrest if the patient has a temperature < 30°C, the interval between doses of adrenaline or amiodarone is doubled as per **CPG P0201 Cardiac Arrest**.

**Intubation**

• Intubated hypothermic patients should have their temperature monitored with an oesophageal temperature probe where available.

• Intubated patients who are sedated and paralysed are at risk of becoming hypothermic and should have thermal management initiated once stabilised.
Flowchart

**Status**
- Hypothermia or
- Potential major trauma

**Assess**
- Perfusion status
- BGL if altered conscious state

**Hypothermia < 35°C**

**Action**
- Protect the patient from heat loss using all available options including:
  - Ensure ambulance heater remains on and the rear of the vehicle closed as much as possible
  - Remove wet clothing and dry the patient
  - Cover the patient above and below with a thermal wrap (sheet/space blanket/standard blanket) or if available, an active warming blanket device
- Intubation needs to be approached with caution in severe hypothermia, due to the risk of stimulating a lethal arrhythmia
- If required consider ETT as per CPG P0301 Endotracheal Intubation (paediatric)

**Potential Major Trauma regardless of T°**

**Action**
- Manage the patient as per relevant CPGs, whilst concurrently protecting the patient from heat loss using all available options including:
  - Ensure ambulance heater remains on and the rear of the vehicle closed as much as possible
  - Minimise scene time as per CPG A0800 Principles of Major Trauma
  - Remove wet clothing and dry the patient
  - Cover the patient above and below with a thermal wrap (sheet/space blanket/standard blanket) or if available, an active warming blanket device
- If patient is a high risk trauma patient (Temp < 35°C or intubated or haemorrhagic shock), all of the above measures are an urgent priority and MUST be implemented as soon as possible, concurrently with other management
Care Objectives

- To identify and appropriately manage hyperthermic patients with an urgency relative to their presentation.
- The focus of treatment must be on aggressive cooling.

General Notes

Intended patient group

- The cause of heat illness may be:
  - Environmental
  - Exertional
  - Chemically mediated

- Heat stroke is generally defined as a temperature > 40°C with associated CNS dysfunction and is an urgent medical emergency.

- There may be some patients who have cross-over between environmental / exertional and toxin induced heat illness. Irrespective of whether the cause is clear, the focus of management is aggressive cooling.

- If a patient presents with signs / symptoms of heat stroke in a context where it is the likely diagnosis, and other causes of CNS dysfunction are ruled out, they should be actively and aggressively cooled. It is expected that the temperature will be >38°C, but the exact number should not be the defining factor when deciding to treat or not.

- Exertional heat illness may affect patients in groups. If presented with a group suffering heat illness, consider requesting further resources such as ice and bottled water be brought to the scene to facilitate cooling and rehydration of multiple patients.

Management

Position

Gentle handling of the patient is essential. Position flat or lateral and avoid head-up positioning as far as possible to avoid hypotension, collapse and possible arrhythmias.

Cooling techniques

Strip / spray / fan

Air flow over the wet skin must be vigorously promoted. Passively blowing air conditioning is not adequate – aggressive fanning is required.

Oral fluids

If the patient is able, cold oral fluids are a suitable method of rehydration.

IV fluids

Cold IV fluid administration is to be titrated to adequate perfusion and consideration of temperature.

Consider a slower rate of fluid administration for the elderly or patients with impaired renal or cardiac function.
**Ice bath / cold shower**
In some sporting environments access to ice baths and/or open shower facilities may facilitate effective rapid cooling for exertional hyperthermia patients. Consider using these techniques where these facilities and resources are readily accessible while preparing for transport.

Some events will also have ice baths on scene for toxin induced hyperthermia patients. In this circumstance it is possible that the patient will be intubated and placed in the bath prior to AV arrival. If definitive transport is going to be delayed (e.g. awaiting HEMS) consider leaving the patient in the ice bath until ready to move.

**Target temperature**
Aim for a target patient temperature < 40°C within 30 minutes of onset of symptoms if possible.

**Intubated hyperthermic patients**
Monitor temperature with an oesophageal temperature probe where available.

**Risk Factors**

**Very young patients**
Very young patients are at increased risk of environmental hyperthermia, particularly during heat wave conditions. There should be a low threshold for transport, even if it is purely so they can be monitored in an air conditioned environment.

**Toxin induced hyperthermia**
Maintain a lower threshold to manage agitation with early sedation to prevent further increases in temperature, as per CPG P0707 Overdose: Sedative Agents/Psychostimulants.
### Flowchart

#### The Febrile Patient

This guideline is **NOT FOR USE** in the patient who is febrile due to suspected infection.

#### Signs and symptoms

- Elevated temperature and any of:
  - Altered consciousness / confusion / incoherent speech
  - Dizziness / collapse
  - Nausea / vomiting
  - Abnormal gait
  - Seizures

#### Other assessments

- BGL if altered conscious state
- Perfusion and hydration status

#### Environmental / Exertional

- Athletic training / playing in hot conditions
- Patient in a hot environment (e.g., hot room, hot car, direct sunlight)

- **Young / fit / healthy patient**
  - Consider immediate ice bath or cold shower if facilities and resources allow while preparing for transport, otherwise:
  - Cooling techniques

  - **Cold Normal Saline IV** (max. 40 mL/kg)
  - Consider intubation as per CPG P0301 Endotracheal Intubation if required to facilitate cooling

#### Toxin induced

- Psychostimulants
- Anticholinergics
- Phenothiazines
- Serotonergics

- **All patients**
  - Consider early request for MICA
  - Cooling techniques
  - Early transport – cooling methods in isolation are less likely to be effective
  - Treat agitation early if required to facilitate cooling (consult RCH)

  - **Cold Normal Saline IV** 20 mL/kg (max. 40 mL/kg)
  - Consider early intubation (consult) as per CPG P0301 Endotracheal Intubation

#### Cooling techniques

- Remove Pt from hot environment
- Strip / spray / fan (aggressive fanning)
- Junctional ice packs

---

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Definitions

<table>
<thead>
<tr>
<th>Term:</th>
<th>37 - 42 weeks gestation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preterm:</td>
<td>24 – &lt; 37 weeks gestation</td>
</tr>
<tr>
<td>Show:</td>
<td>Vaginal discharge of mucous and blood</td>
</tr>
<tr>
<td>Spontaneous rupture of membranes:</td>
<td>Gush of normally clear or pink coloured fluid. Can occur from prior to onset of labour until baby is born.</td>
</tr>
<tr>
<td>Meconium stained amniotic fluid:</td>
<td>Greenish / brown stained amniotic fluid</td>
</tr>
<tr>
<td>First stage labour:</td>
<td>Onset of regular painful contractions to full cervical dilatation (i.e. contractions every 2 - 20 minutes, 20 - 60 seconds duration)</td>
</tr>
<tr>
<td>Second stage labour:</td>
<td>Full cervical dilatation to birth of baby (typical duration Primipara 1 - 2 hours, Multipara 15 - 45 minutes)</td>
</tr>
<tr>
<td>Imminent birth presentation:</td>
<td>Active pushing / grunting Rectal pressure – urge to use bowels or bladder Anal pouting / bulging perineum Strong unstoppable urge to push Presenting part (baby’s head) on view - crowning Mothers statement – “I am going to have the baby”</td>
</tr>
<tr>
<td>Precipitate birth:</td>
<td>Unusually rapid labour (less than 4 hours) with extremely quick birth. The rapid change in pressure from intrauterine life may cause cerebral irritation.</td>
</tr>
</tbody>
</table>

Role of paramedics at a home birth

There are home birth programs that have been set up in conjunction with hospitals and under the guidance of the Victorian Department of Health. The midwives in these programs are endorsed by their hospital and will be equipped and have a range of medications to manage common obstetric emergencies and will have two midwives present. In the case of Ambulance Victoria attending the home of a woman in one of these home birth programs (as opposed to an independent home birth), the Ambulance Victoria paramedic will work with the health service midwives to ensure safe and effective care. In the case of an obstetric emergency, the paramedics will usually assist the attending midwives. If the reason for the emergency call is not related specifically to the birth (for example cardiac arrest), the Ambulance Victoria paramedic will take the clinical lead with the home birth midwives assisting. If the home birth is not part of an obstetric hospital staffed and supported program, paramedics are expected to take the clinical lead in all cases, with assistance from any trained staff present at their discretion. If disagreement between parties at scene cannot be resolved, consult with PIPER.
Assessment

Focussed history

In addition to routine history/examination

Previous pregnancies

- Any / number of previous pregnancies?
- Prior caesarean sections / interventions?
- Complications / problems with previous pregnancies?
- Length of previous labours?

Current pregnancy

- How many weeks pregnant are you?
- Are you expecting a singleton or multiple pregnancy?
- Have your membranes ruptured? What was the colour of the amniotic fluid?
- Are you having contractions? Assess frequency and duration.
- Do you have an urge to push?
- Have you felt fetal movements? More / less or same as normal?
- Hospital interventions (if any)?
- Do you anticipate any problems / complications (baby / mother)?
- Have you had any antenatal care?
- Any current complaints?
  - vaginal bleeding / PV loss
  - high BP
  - pain
  - trauma
  - any other issues
Physiological Parameters

**Cardiovascular**

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>BP</strong></td>
<td>Minimal change – initial decrease in 1st and 2nd trimesters, normal in 3rd trimester SBP &gt; 170 mmHg and DBP &gt; 110 mmHg is significant</td>
</tr>
<tr>
<td><strong>HR</strong></td>
<td>↑ by 15 – 20 bpm (Normal pregnancy HR 80 – 110 bpm)</td>
</tr>
<tr>
<td><strong>Cardiac output</strong></td>
<td>↑ by 30 – 40% (Normal volume 6 – 7 L/minute during pregnancy)</td>
</tr>
<tr>
<td><strong>ECG</strong></td>
<td>Non specific ST changes, Q waves – (leads III and AVF) atrial and ventricular ectopics</td>
</tr>
<tr>
<td><strong>SVR</strong></td>
<td>↓ due to progesterone and blood volume</td>
</tr>
</tbody>
</table>

**Respiratory**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Respiratory rate</strong></td>
<td>↑ by 15% (2 – 3 breaths/minute) 14 - 19 breaths/minute at term</td>
</tr>
<tr>
<td><strong>O₂ demand</strong></td>
<td>↑ by 15 - 20%</td>
</tr>
<tr>
<td><strong>Minute ventilation</strong></td>
<td>↑ by 25 – 50% (11 - 19 L/minute at term)</td>
</tr>
<tr>
<td><strong>Tidal volume</strong></td>
<td>↑ by 25 – 40%</td>
</tr>
<tr>
<td><strong>Arterial pH</strong></td>
<td>↑ to 7.40 – 7.45</td>
</tr>
<tr>
<td><strong>PaO₂</strong></td>
<td>↑ by 10 mmHg (104 - 108 mmHg at term)</td>
</tr>
<tr>
<td><strong>PaC₂</strong></td>
<td>↓ 27 – 32 mmHg</td>
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</tbody>
</table>

**Haematological**

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<table>
<thead>
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<tbody>
<tr>
<td><strong>Blood volume (mL)</strong></td>
<td>↑ 30 – 50% vol (5,500 mL at term)</td>
</tr>
<tr>
<td><strong>Haemoglobin (g/dL)</strong></td>
<td>↓ 10 – 14 Red cell mass ↑ by 20 – 30% but is less than blood volume increase</td>
</tr>
<tr>
<td><strong>Haemoglobin (g/L)</strong></td>
<td>↓ 100 – 140</td>
</tr>
<tr>
<td><strong>Haematocrit (%)</strong></td>
<td>↓ 32 – 42 (physiological anaemia)</td>
</tr>
<tr>
<td><strong>Plasma volume (mL)</strong></td>
<td>↑ 30 – 50%</td>
</tr>
</tbody>
</table>
Basic Care

As per Clinical Approach CPG A0101 with the following modifications:

**Position:** (If patient > 20 weeks pregnant)

- Allow the woman to assume a safe position of comfort. If supine, a left lateral tilt can help to reduce aorta-caval compression and subsequent hypotension.
- A 30° tilt can be achieved by placing a wedge (using blankets or pillows if required) under the patient’s right hip. This can significantly improve BP.
- If patient requires spinal immobilisation, then she should be packaged and tilted as an entire unit with a 15° tilt.

**Supplemental O₂:** To maintain SpO₂ > 94%

**IV access and fluid therapy:**

- Early IV access required in emergencies.
- Consider high compensatory ability in pregnancy. The mother may lose up to 30 – 35% (2 L) circulating blood volume before showing signs of shock / hypotension.
- Fetus may be compromised even when the mother appears stable.

**Stabilisation:**

- Assessment and resuscitation of the mother must take priority as ultimately the welfare of the fetus is optimised by providing the best available care to the mother.
- If there is any doubt as to the application of any maternity CPG, consult with PIPER

**Triage:**

- Fetal morbidity and mortality can occur with seemingly minor blunt trauma.
- All injured pregnant women should have an obstetric assessment due to the risk of placental abruption.
- Even minor injuries may be associated with complications such as feto-maternal haemorrhage.

**Contact Paediatric Infant Perinatal Emergency Retrieval (PIPER) 24/7 via Clinician or on 1300 137 650.**
Flowchart

Maternity Clinical Network (SCV)

Related Resources

- Maternity Clinical Network (SCV)
General Notes

- If birth is imminent transport to the closest hospital with a maternity service.

Metropolitan

- When transporting a baby born outside hospital or a woman in labour, if >36 weeks gestation and an uncomplicated labour is anticipated, transport to the maternity unit the patient is booked into. If the patient is not booked into a maternity unit, transport to the closest unit. Notify receiving facility.

- If between 32 – 36 weeks gestation, consult with PIPER for destination advice.

- If <32 weeks gestation transport the patient to the closest of the Royal Women’s Hospital, Mercy Hospital for Women Heidelberg or Monash Medical Centre Clayton, as the patient will need NICU facilities.

Rural

- All pregnant women with complications of pregnancy/labour should be transported to the closest regional base hospital.
Flowchart

Status
- Known or suspected pregnancy

Alfred Hospital
Pregnant women must not be transported to the Alfred Hospital unless in cardiac arrest < 24 weeks gestation with mCPR in progress as resuscitative hysterotomy is no longer indicated in this patient group.

✅ Obstetric issue
- Any condition covered by the Maternity Emergency CPGs
- Ruptured membranes / labour
- Lower abdominal pain indicating possible ectopic pregnancy
- Hyperemesis of pregnancy

Transport to a primary obstetric service
Consult with the Clinician for advice if required

✅ Non-obstetric issue
- Cardiac presentations
- Respiratory presentations including asthma or suspected PE
- Neurological presentations including suspected eclampsia
- Overdose
- Mental health issues

Do not transport to a primary obstetric service
Transport to closest major ED capable of receiving a critically ill adult and that has obstetric support
Consult with PIPER for advice if required

✅ Minor trauma
Do not transport to a primary obstetric service
Excluding the Alfred Hospital, transport to the nearest major, metropolitan or rural trauma service with obstetric support
Consult with PIPER for advice if required
Female Genital Mutilation/Cutting includes all procedures that involve partial or total removal of the external female genitalia, or other injury to the female genitals, for non-medical reasons.

It is most commonly practiced in approximately 30 countries in Africa, the Middle East and Asia. Paramedics may encounter a patient who has migrated to Australia having undergone the procedure previously.

It is usually performed on girls between infancy and age 15. Some patients will have had it performed on them and be unaware that it was done. It is important for the psychological health of the patient to be sensitive when asking about FGM/C.

It is important not to react with shock if FGM/C is noted during assessment. The patient should not be left feeling ashamed. When asking about the medical history, the preferred terminology is female genital cutting or circumcision, as patients do not see themselves as mutilated.

There are four types of FGM/C ranging from part or all of the clitoris being removed, through to stitching or cauterizing the labia, closing off most of the vaginal opening.

Assessment and cultural considerations

- FGM/C can lead to significant complications during childbirth, including prolonged second stage of labour, increased risk of tears/lacerations and associated haemorrhage, increased need for episiotomy and increased need for a caesarean section.
- If a patient is geographically close to hospital and can be loaded into the ambulance, rapid transport with notification is the best option. If a patient is not geographically close to hospital or cannot be loaded due to advanced labour, PIPER will advise on management options.
- FGM/C cases may be confronting in some circumstances. Staff are encouraged to contact Peer Support on 1800 626 377.
- If a woman presents in labour and has had FGM/C, contact PIPER as soon as possible via the Clinician or on 1300 137 650 for support and advice.

General Care
Flowchart

**Status**
- Antepartum haemorrhage

**Assess**
- Perfusion status
- External bleeding
- Patient Hx
- Abdominal pain
- > 20 weeks gestation

**No clinical signs of altered perfusion**
- Antepartum haemorrhage

**Action**
- Place Pt in left lateral tilt position
- Tx to appropriate obstetric hospital

**Any clinical signs of altered perfusion**
- Internal bleeding may greatly exceed visible external bleeding
- Signs of poor perfusion may present late and are always significant

**Action**
- Place Pt in left lateral tilt position
- Tx to appropriate obstetric hospital with notification in all cases
- Less than adequate perfusion:
  - Consider Normal Saline IV (max. 40 mL/kg) titrated to patient response
  - Consult for further fluid. If consult unavaliable repeat Normal Saline 20 mL / kg IV
- Mx pain as per CPG A0501 Pain Relief
Pre-eclampsia and eclampsia are time critical emergencies requiring early recognition, intervention and prompt transport to reduce perinatal and maternal mortality.

Signs and symptoms of pre-eclampsia include:
- headache
- cerebral irritability/agitation
- visual disturbances (flashing lights, shimmering)
- nausea and / or vomiting
- heartburn / epigastric or abdominal pain
- hyper-reflexia
- An elevation of 20 mmHg above normal blood pressure may be sufficient to indicate pre-eclampsia if other signs or symptoms are present.

Uterine pain and / or PV bleeding may signify abruption.

The most common cause of seizures in pregnancy is pre-existing epilepsy. New onset seizures in the latter half of pregnancy are most commonly eclampsia.

Seizures may occur during or post birth, usually within 48 hours of birth.

There are no reliable clinical indicators to predict eclampsia. Eclamptic seizures usually do not last longer than 90 seconds and are self-limiting.

The only definitive treatment is birth of the baby.

Provide early hospital notification.

Paediatric Infant Perinatal Emergency Retrieval (PIPER) for advice via Clinician or on 1300 137 650

Inter hospital transfer

Management of this condition may involve pharmacological control of hypertension, neurological instability and the prevention of seizures. This may include:

Nifedipine

- Initial hospital dose is 10 mg oral, repeated after 30 minutes if inadequate response.

MICA only IHT drugs

Loading doses and infusions should be established prior to transport. IV Magnesium Sulphate

- Indicated for severe pre-eclampsia and for seizure prophylaxis. Infusion via a dedicated line and controlled infusion device with ECG monitoring in situ. A usual loading dose is 4 mg IV over 10 – 15 minutes or via IM with maintenance infusion usually at 1 g/hr (4 mmol/hr) until at least 24 hours post delivery or last seizure.

IV Labetolol

- Initial IV bolus of 20 mg given slowly over 2 minutes. This can be repeated every 10 minutes until optimal BP is achieved or max. dose of 300 mg delivered. Alternatively a 20 – 160 mg/hr infusion can follow the initial bolus titrated to achieve optimal BP.
IV Hydralazine

- Initial IV bolus (usually 5 – 10 mg) over 5 – 10 minutes. This can be repeated two more times at 30 minute intervals. Maintenance infusion run at 5 mg/hr. Adjust rate to maintain BP between 140 - 160 / 90 - 100 mmHg. The BP should not fall below 140/80 mmHg as the placental circulation will have adapted to a higher BP.

The severity of the disease will dictate the escort’s scope of practice – MICA, AAV MICA, midwife / obstetrician escort, ARV.
**Flowchart**

1. **Status**
   - Imminent normal birth

2. **Assess**
   - Maternity Hx
   - Labour progression

3. **Stop**
   - Opioid analgesics are C/I in late second stage labour

4. **Normal birth - not imminent**
   - Action
     - Reassure
     - Monitor regularly for change
     - Tx to appropriate maternity service facility using a left lateral tilt position
     - Provide analgesia as per CPG A0501 Pain Relief

5. **Imminent normal birth - preparation**
   - Action
     - Reassure including cultural considerations
     - Prepare equipment for normal birth
     - Provide a warm and clean environment
     - Provide analgesia as per CPG A0501 Pain Relief

6. **Normal birth - birth of head**
   - Action
     - As head advances, encourage the mother to push with each contraction
     - If head is birthing too fast, ask mother to pant with an open mouth during contractions instead
     - Place fingers on baby’s head to feel strength of descent of head
     - Apply gentle pressure to the parineum to reduce risk of perineal tears
     - If precipitous, apply gentle backward and downward pressure to control sudden expulsion of the head
       - **Do not hold back forcibly**
     - Note the time once head is delivered

7. **Normal birth - umbilical cord check**
   - Action
     - Following the birth of the head, check for umbilical cord around neck
     - If loose and wrapped around neck:
       - Slip over baby’s head with appropriate traction
     - If tight:
       - Mother should be encouraged to push
       - Where the baby does not descend and cord still cannot be loosened, clamp and cut cord

8. **Normal birth – head rotation**
   - Action
     - With the next contraction the head will turn to face one of the mother’s thighs (restitution)
       - This indicates internal rotation of shoulders in preparation for birth of body
### Normal birth – birth of the shoulders and body

**Action**

- May be passive or guided birth
- Hold baby’s head between hands and if required apply gentle downwards pressure to deliver the anterior (top) shoulder
- Once the baby’s anterior shoulder is visible, if necessary to assist birth, apply gentle upward pressure to birth posterior shoulder – the body will follow quickly
- Support the baby
- Note time of birth
- Place baby skin to skin with mother on her chest to maintain warmth unless baby is not vigorous / requires resuscitation
- Mx the vigorous newborn as per **CPG N0101 Newborn Baby**
- Mx the non vigorous newborn as per **CPG N0201 Newborn Resuscitation**
- If the body fails to deliver in < 60 sec after the head Mx as per **CPG M0305 Shoulder Dystocia**
- Following delivery of baby, gently palpate abdomen to ensure second baby is not present

### Normal birth – clamping and cutting the cord

**Action**

- There is no immediate urgency to cut the cord. Wait for the cord to stop pulsating, which commonly takes one to two minutes. Allow birthing partner to cut the cord if they wish. Ideally, cord cutting should be undertaken prior to extrication.
- To cut the cord, apply first clamp 10cm from the baby and the second clamp a further 6cm from the first, then cut between the two clamps.
- For uncomplicated births, a parental birthing preference where mother and baby are transported to hospital still attached is permissible e.g. lotus births

### Normal birth – birthing placenta (third stage)

**Action**

- Delivery of baby to placenta.

**Passive (expectant) Mx**

- Allow placental separation to occur spontaneously without intervention
- This may take from 15 minutes up to 1 hour
- Position mother sitting or squatting to allow gravity to assist expulsion
- Breast feeding may assist separation or expulsion

**Do not pull on cord – wait for signs of separation**

- lengthening of cord
- uterus becomes rounded, firmer, smaller
- trickle or gush of blood from vagina
- cramping / contractions return

- Placenta and membranes are birthed by maternal effort. Ask mother to give a little push
- Use two hands to support and remove placenta using a twisting ‘see saw’ motion to ease membranes slowly out of the vagina
- Note time of delivery of placenta
- Place placenta and blood clots into a container and transfer
- Inspect placenta and membranes for completeness
- Inspect that fundus is firm, contracted and central
- Continue to monitor fundus though do not massage once firm
- If fundus is not firm or blood loss > 500 mL Mx as per **CPG M0401 Primary Postpartum Haemorrhage (PPH)**
Types of Breech Presentation

A. Breech with extended legs (frank breech) – buttocks present first with flexed hips and legs extended on the abdomen. Most common = ½ of all breech presentations.

B. Breech with flexed legs (complete breech) – buttocks present first with flexed hips and flexed knees.

C. Footling – one or both feet present as neither hips nor knees are fully flexed. Feet are palpated lower than the buttocks.

- It is normal for meconium to be passed as the baby’s buttocks are squeezed.
- Cord prolapse is more common with breech presentation.
- If a known breech and birth is not imminent, transport to a booked obstetric unit with capacity for surgical intervention. Provide early hospital notification.
- In the setting of precipitous delivery with back not uppermost, consider positioning mother kneeling on all fours to allow restitution.
**General Care**

**During all breech labour**

- Keep mother informed of progress. Encourage mother to push hard with contractions.
- Position mother with buttocks to bed edge with legs supported (lithotomy position) if on a stretcher or bed. Standing or squatting may be preferred by the mother and is more anatomically and physiologically sound though not suited to transport or imminent birth.
- A hands off approach encourages the baby to maintain a position of flexion, which simplifies birth.
- Only touch to gently support. If too much stimulus is provided the baby will extend flexed head.
- Main force of birth is maternal effort. Do not attempt to pull baby out. The key is to allow the birth to occur spontaneously with minimal handling of the newborn.
- Most additional manoeuvres are only required in the event of delay.
- Prevent hypothermia by maintaining a warm environment. Use available resources e.g. warm towels or bubble wrap to wrap the baby if the body is exposed for an extended period. Cool air may stimulate breathing which is not desirable if the head remains unborn.

**Flowchart**

- **Status**
  - Suspected breech birth

- **Assess**
  - Stage of labour and birth imminent
  - Buttocks or both feet presenting first
  - One foot or hand / arm presenting first

- **Stop**
  - Opioid analgesics are O/C in late second stage labour
  - Do not attempt delivery of one foot or hand / arm presentation
  - Only proceed with delivery if birth is imminent

- **Non imminent birth**
  - Action
    - General maternal care
    - Tx to booked appropriate maternity service unit with notification

- **One foot, hand or arm presenting**
  - Action
    - Do not attempt to deliver
    - Tx urgently to an appropriate maternity service unit with notification
    - Consult with PIPER for advice

- **Intramural breech birth – buttocks or both feet presenting**
  - Action
    - Mx as per CPG M0301 Normal Birth except for:
      - Request urgent assistance
      - Reassure including cultural considerations
      - Prepare obstetrics equipment
      - Provide a warm and clean environment
      - Provide analgesia as per CPG A0501 Pain Relief
      - Allow the birth to occur spontaneously
      - Position mother with buttocks to bed edge and legs supported to allow gravity to assist
      - Do not touch baby as it emerges
      - Hands off the breech
      - The birth of buttocks / feet will occur slowly
**Buttocks first presentation – back uppermost – delivery of body/legs**

- Do not attempt to pull the baby out
- Encourage mother to push hard with contractions
- Feet and legs should spring free
- Await further descent
- Keep body warm by wrapping in a towel or bubble wrap if needed
- The body will further descend to the clavicles and arms should swing free
- Let baby hang until the nape of neck is visible
- The baby should face downward
- Assist birth of the head using modified Mauriceau Smellie Veit Manoeuvre

---

**Buttocks first presentation – back uppermost – delivery of head**

- Modified Mauriceau Smellie Veit Manoeuvre
  - Place the index and ring finger of non dominant hand on the baby’s shoulders and middle finger on the occiput to assist with flexion of the head
  - Place dominant hand under the baby to support the body, with ring and index fingers on the baby’s cheekbones
  - Slowly lift the baby straight up in a circle onto the mother’s abdomen, allowing the head to birth slowly
  - An assistant can aid flexion of head by applying direct pressure behind the pubic bone
Flowchart continued

1. **Buttocks first presentation – back not uppermost**
   - **Action**
     - The baby's back needs to remain uppermost
     - If legs delivered and back is not uppermost
       - Gently hold the baby by placing thumbs on bony sacrum with fingers around thighs.
       - Do not squeeze the abdomen
       - Rotate / turn baby uppermost between contractions taking care of baby's spine
       - Take great care to never pull the baby

2. **Buttocks first presentation – legs don't birth spontaneously**
   - **Action**
     - If extended legs (frank breech)
       - slip one hand along the leg of the baby lying anteriorly
       - place a finger behind the baby's knee and deliver it by flexion and abduction

3. **Buttocks first presentation – arms don't birth spontaneously**
   - **Lovsett's Manoeuvre**
   - **Action**
     - Hold baby by the sacrum
     - Turn baby 90 degrees so that one shoulder is in the antero-posterior diameter
     - Insert a finger into the brachial plexus and sweep the arm down over the baby's chest
     - Turn baby 90 degrees so that the opposite shoulder is in the antero-posterior diameter
     - Repeat the finger manoeuvre
     - Turn the baby 90 degrees again so that the back is uppermost
     - Await further descent
     - Do not pull or apply traction

Contact PIPER via Clinician or on 1300 137 650 for advice
There is a high possibility of abnormal presentation.

Tocolytics are drugs intended to suppress premature labour. They are contraindicated in the setting of massive maternal haemorrhage (APH) and pregnancy induced hypertension (pre-eclampsia / eclampsia).

Consider transporting patient semi-prone with hips elevated over folded towels in order to take pressure off amniotic sac.

Inter hospital transfer

Some women may be receiving tocolytics to suppress preterm labour. This may include pharmacotherapy including:

Nifedipine

- The drug of choice. Initial dose of up to 20 mg orally given by hospital. Monitor for adverse reaction prior to transport. Can repeat if contractions persist after 30 minutes. Ongoing monitoring of blood pressure and pulse is required.

GTN Patch 50 mg (0.4 mg/hour) transdermal

- Placed on abdomen. A further 50 mg (0.4 mg/hour) patch may be added after 1 hour if contractions persist (maximum dose 100 mg in 24 hours). Paramedics may commence this therapy after appropriate consultation.

- A 50 mg Transiderm patch delivers 10 mg per 24 hours at 0.4 mg/hour. Obstetric services may quote 10 mg patch instead of 50 mg as actual dose being delivered.

Contact PIPER via Clinician or on 1300 137 650 for advice
Cord Prolapse

Special Notes

- This is a time critical emergency – early diagnosis, immediate intervention and prompt transport to an appropriate facility are effective in reducing the perinatal mortality rate.

- Notify the receiving hospital early.

- In most instances caesarean section is the preferred method of birth, however if birth is imminent encourage mother to push – this ONLY applies when the presenting part is distending the perineum and the mother is pushing uncontrollably. Prepare for resuscitation of the newborn as per CPG N0201 Newborn Resuscitation.

- Cord prolapse is usually associated with an unstable lie or malpresentation.

- Cord handling should be kept to a minimum as this can lead to vasospasm or contraction of umbilical vessels.

- Key history is important: time membranes ruptured, how long has the cord been visible, due date, fetal movement felt, onset of labour, contractions present, fetal presentation if known, PV bleeding.

Contact PIPER via Clinician or on 1300 137 650 for advice
Flowchart

### Status
- Cord prolapse: umbilical cord visible at vulva with ruptured membranes

### Assess
- Cord visible at vulva
- Ruptured membranes
- Stage of labour

### Birth not imminent – Mx of mother
- **Action**
  - Position patient semi-prone with hips elevated over folded towels
  - Provide explanation and reassurance
  - High flow $O_2$ therapy

### Birth not imminent – Mx of cord
- **Action**
  - Minimise cord handling
  - Keep cord warm and moist. Use 2 fingers to gently place cord in vagina
  - If unsuccessful cover with warm saline packs (if possible)

### Birth not imminent – Mx of presenting part
- **Action**
  - If there is pressure on the cord by the presenting part insert fingers into vagina and push the presenting part (head) away from the cord
  - Maintain pressure until birth commences or advised to release

### Birth commencing
- **Action**
  - Instruct mother to push
  - Assist in delivery
  - Prepare for newborn resuscitation
  - Mx as per CPG M0301 Normal Birth
  - Mx as per CPG N0201 Newborn Resuscitation

---

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
This is a time critical situation. There is 5 - 7 minutes to deliver the baby due to compression of the cord against the pelvic rim.

Explain the situation to the mother to gain maximum co-operation.

It is important to note times of birth of head, timing of manoeuvres and delivery of body.

The newborn is likely to be compromised in this setting and require resuscitation.

During procedures, be prepared for a sudden release of resistance and be prepared to take hold of the baby.

The process of releasing the baby may cause injury, particularly clavicle fracture. Manage any such injury appropriately including arm immobilisation.

If these manoeuvres are not successful, consult with PIPER regarding when to abandon attempts to deliver and initiate transport.

Contact PIPER via Clinician or on 1300 137 650 for advice
Flowchart

**Shoulder Dystocia CPG M0305**

**Assess**
- Normal birthing procedure fails to accomplish delivery
- Prolonged head-to-body delivery time (> 60 sec)
- Difficulty with birth of face and chin
- Baby’s head retracts against perineum (turtle sign)
- Failure of baby’s head to resurface
- Failure of shoulders to descend
- Difficulty reaching neck when attempting to check for cord around neck
- Baby’s head colour turns purple then black

**Prolonged head to body delivery time (> 60 sec)**

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note time of birth of head</td>
</tr>
<tr>
<td>Request urgent additional assistance</td>
</tr>
<tr>
<td>Explain to mother and ask her to push with focused effort when required</td>
</tr>
<tr>
<td>Position mother with buttocks at bed edge</td>
</tr>
<tr>
<td>Apply gentle downward traction to deliver anterior shoulder</td>
</tr>
</tbody>
</table>

**Delivery accomplished - newborn**

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mx as per CPG N0201 Newborn Resuscitation</td>
</tr>
<tr>
<td>Assess for clavicle injury and immobilise if necessary</td>
</tr>
</tbody>
</table>

**Delivery accomplished - mother**

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic care</td>
</tr>
<tr>
<td>Reassure</td>
</tr>
</tbody>
</table>

**Delivery not accomplished - after 30 - 60 sec**

<table>
<thead>
<tr>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate the following sequence until baby is delivered</td>
</tr>
<tr>
<td>Mx as per Delivery accomplished if successful at any time</td>
</tr>
</tbody>
</table>

**At no time attempt to rotate the baby’s head — rotate shoulders using pressure on the baby’s scapula instead**
Flowchart continued

- **Delivery not accomplished after 30 - 60 sec**
  - **Action**
    - Hyperflexion of maternal hips (McRobert's manoeuvre) – knees to nipples
      - Place mother in a recumbent position
      - Hips to edge of bed enabling better access for gentle downward traction
      - Assist mother to grasp her knees and pull her knees/thighs back as far as possible onto her abdomen (use assistant to help achieve and maintain position)

- **Delivery remains not accomplished after 30 - 60 sec**
  - **Action**
    - Suprapubic pressure whilst in McRobert's position
      - Hands in CPR position behind symphysis pubis, at 45° angle along baby's back (trying to rotate baby forward)
      - Apply 30 sec firm downward pressure, then 30 sec rocking motion to get shoulder out from under rim, at rate of approx 1 per sec.

- **Delivery remains not accomplished after 30 - 60 sec**
  - **Action**
    - All Fours (Gaskin) manoeuvre
      - Rotate mother to all fours
      - Hold baby's head and apply gentle downward traction – attempting to dis-impact and deliver the posterior shoulder (now uppermost)

- **Delivery accomplished**
  - **Action**
    - Mix as above
    - The newborn is likely to require resuscitation

- **Delivery remains unaccomplished**
  - **Action**
    - Consult with PIPER regarding when to abandon manoeuvres and Tx
    - If unable to consult, Tx with notification
    - Tx in McRobert’s manoeuvre position with 30° left lateral tilt
Special Notes

- Massaging a fundus that is firm, central and contracted may interfere with normal placental post birth separation and worsen bleeding. Fundal massage should only be applied when the fundus is not firm.

- Causes of PPH include the 'four Ts':
  - Tone (uterine atony)
  - Trauma (to genital structures)
  - Tissue (retention of placenta or membranes)
  - Thrombin (coagulopathy)

  The most common cause of PPH is uterine atony.

- **An empty and contracted uterus does not bleed.**

- Higher risk patients include multiple pregnancy, more than four pregnancies, past history of PPH, history of APH, large baby.

- Normally the fundus will not become firm and contracted until the placenta is delivered. Avoid fundal massage prior to placental delivery and continue checking for PV bleeding and observing vital signs.

- Where severe bleeding occurs at 24 hrs to 6 weeks post birth (secondary PPH), consult with receiving hospital regarding the administration of **Oxytocin**

Contact Paediatric Infant Perinatal Emergency Retrieval (PIPER) via Clinician or on 1300 137 650 for advice
Primary Postpartum Haemorrhage (PPPH) CPG M0401

Flowchart

- **Status**
  - PPH (blood loss > 500 mL in first 24 hr from birth)

- **Assess**
  - Fundus tone
  - Visible blood loss
  - Perineal / vaginal laceration

- **Fundus firm**
  - Palpable firm, central and compacted fundus

  - **Action**
    - High flow O₂ therapy
    - Analgesia as required as per CPG A0501 Pain Relief
    - BP < 90 mmHg:
      - Consider Normal Saline IV (max. 40 mL / kg) titrated to patient response
      - Consult for further fluid. If consult unavailable repeat Normal Saline 20 mL / kg IV
    - Mx any visible laceration with a dressing and firm pressure

- **Fundus not firm**

  - **Action**
    - Mx as per fundus firm
    - Normally the fundus will not become firm and contracted until the placenta is delivered
      - Avoid fundal massage prior to placental delivery and continue checking for PV bleeding and observing vital signs
    - Massage fundus until firm and blood loss reduces
      - Use a cupped hand
      - Apply firm pressure in a circular motion
    - Encourage mother to empty bladder if possible
    - Encourage baby to suckle breast

- **Fundus remains not firm**

  - **Action**
    - Oxytocin 10 IU IM
    - Repeat Oxytocin 10 IU IM after 5 minutes if bleeding continues
    - DO NOT ATTEMPT delivery of placenta due to risk of uterine inversion

- **Intractable haemorrhage**

  - **Action**
    - Perform external abdominal aortic compression:
      - Locate point of compression just above the umbilicus and slightly to the left
      - Apply downward pressure with a closed fist directly through the abdominal wall
      - Effectiveness of compression may be evaluated by assessing palpable femoral pulse with pressure applied

This is an uncontrolled document, it is the reader’s responsibility to ensure currency.
Miscarriage is a common but distressing complication of pregnancy that refers to the unexpected loss of a pregnancy prior to 20 weeks gestation. An infant delivered without signs of life at ≥ 20 weeks gestation (or > 400 grams where gestation is unclear) is legally regarded as a stillborn. Regardless of signs of life, patients may be managed under this guideline < 23 weeks gestation. Infants delivered ≥ 23 weeks gestation, or where the gestation is unclear but there is a reasonable likelihood that it may be ≥ 23 weeks, should be managed per CPG N0201 – Newborn resuscitation. It is a legal requirement in Victoria that any infant born at ≥ 20 weeks gestation, or showing signs of life regardless of gestation, be registered by completing a Birth Registration Statement (BRS). A hospital, medical facility or midwife can issue a BRS. There is no requirement that stillbirths or miscarriages be reported to the coroner or police unless the loss of pregnancy has occurred due to violence or injury.

Women experiencing potential miscarriage typically may present with:

- Abdominal or pelvic pain/cramping. Pain may radiate to the lower back, buttocks or genitals.
- Vaginal bleeding may be present and can range from spotting to life threatening haemorrhage. Depending on gestation and the nature of the miscarriage, the patient may pass the products of conception.

There is no diagnostic procedure or specific management of miscarriage in the pre-hospital environment. Management should focus on emotional support of the mother and treatment of symptoms such as pain and nausea. Paramedics should always keep a high index of suspicion for life threatening complications, such as major haemorrhage or ectopic pregnancy.

Not all vaginal bleeding or antepartum haemorrhages that occur during pregnancy result in the loss of the foetus. Avoid definite statements or promises that provide false hope or a clear diagnosis. However, paramedics should be honest with the patient about the possibility of miscarriage. Offering some sense of what comes next is reasonable. Where the outcome is unclear, an ultrasound and blood tests are possible but it is likely that the ED may not be able to provide a definite answer in regards to the viability of the pregnancy.

Patients may pass products of conception which can range in nature from blood clots to a recognisable foetus. In the event of preterm labour late in the second trimester, delivery may proceed spontaneously. The foetus may initially make small movements or gasp. While an infant delivered at greater than 20 weeks gestation must be registered as a birth from a legal perspective, there is no prospect for successful resuscitation prior to 23 weeks gestation. It is reasonable for paramedics to withhold resuscitation and this decision should be explained to the mother in a sensitive way.

Regardless of appearance or gestation, the foetus may be important to the mother. Do not dispose of them. Treat them with respect in accordance with the mother’s wishes. If necessary, clamp and cut the umbilical cord. Paramedics should wrap and transport them with the mother as products of conception are generally sent to pathology for further examination. The mother or other family may wish to hold the infant, especially if it has shown signs of life and a resuscitation attempt is withheld. This should be encouraged where appropriate as parents often feel comforted by the fact that the infant was held during the dying process. Where the mother does not wish to, it may be appropriate for other family members or the attending crew to hold the infant. Referring to the pregnancy as a baby, or using the babies name if it has one, is generally preferable. Avoid the use of medical terminology such as spontaneous abortion or products of conception.

Many women experience a strong sense of loss, sadness, anger, disbelief, disappointment, sense of isolation and often guilt. It is normal to experience a range of feelings. Paramedics should acknowledge the impact of the miscarriage with compassion and understanding. Minimising the loss of the pregnancy with statements such as, “you’re young, you can try again”, can significantly worsen the patient’s experience.
It is appropriate to treat pain, nausea and hypovolaemia per the relevant guidelines in the patient experiencing potential miscarriage. Misoprostol should not be used to treat bleeding in the setting of miscarriage (i.e. < 20 weeks gestation).
Care Objectives

- Establish and maintain effective respiration
- Prevent hypothermia
- Transport to appropriate facility

Definitions

**Newborn:** Refers to the first minutes to hours post birth. Newborn resuscitation principles can be applied up to 24 hours post birth due to respiratory and cardiovascular changes during this time.

**Viability:** Resuscitation should be withheld for infants born < 23 weeks’ gestation regardless of signs of life. Consult with PIPER for advice if there is any uncertainty.

**Preterm infant:** < 37 weeks’ gestation.

Heart rate is the most important indicator of effective ventilation. It should be used to guide the need for, and effectiveness of, resuscitation.

Drying and covering the newborn in addition to skin-to-skin contact with the mother is important to prevent hypothermia. This can be done while initially assessing breathing and tone.

Where the newborn is ≥ 37 weeks’ gestation and experienced no complications at birth, transport to an appropriate maternity service. Where the newborn is preterm and/or required resuscitation, transport to a higher level of care is appropriate in consultation with PIPER.

**Paediatric Infant Perinatal Emergency Retrieval (PIPER)**
Advice and assistance in newborn management
Contact via the clinician or 1300 137 650
Normal Values

<table>
<thead>
<tr>
<th>Weight (avg full term)</th>
<th>3.5 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal blood volume</td>
<td>80 mL/kg</td>
</tr>
<tr>
<td>Heart rate</td>
<td>110 – 170</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>25 – 60</td>
</tr>
<tr>
<td>Temperature</td>
<td>36.5 – 37.5</td>
</tr>
<tr>
<td>BGL</td>
<td>2.6 – 3.2 mmol/L</td>
</tr>
</tbody>
</table>

Appearance

Dusky and peripherally cyanosed in the first few minutes. Blue-ish / purple hands and feet are normal in the first 24 hours after birth. Supplemental oxygen is generally not required where the newborn is breathing effectively and the HR is > 100. Good muscle tone (flexing arms and legs). Spontaneous regular breathing.

Targeted SpO₂ (mins post birth) Pulse oximeters should always be placed on the right wrist (pre-ductal).

<table>
<thead>
<tr>
<th>Time</th>
<th>SpO₂ range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 min</td>
<td>60 – 70%</td>
</tr>
<tr>
<td>3 mins</td>
<td>70 – 90%</td>
</tr>
<tr>
<td>5 mins</td>
<td>80 – 90%</td>
</tr>
<tr>
<td>7-10 mins</td>
<td>&gt; 90 %</td>
</tr>
</tbody>
</table>

Initial management

- Paramedics should treat as per CPG N0201 Newborn resuscitation where the newborn does not rapidly develop effective respirations and good muscle tone after drying and stimulating; deteriorates at any stage or is unable to maintain a HR >100 bpm.
- Where the newborn is vigorous, dry the newborn and place the newborn naked, skin-to-skin on the mother’s chest. Dry the head. Cover both mother and newborn with warm blankets/towels. Newborns lose heat via the large surface area of their head and by evaporation from their wet bodies.
- Where resuscitation is required, the newborn should be placed on a warm, flat surface. A woollen hat or the corner of a blanket may be placed over the top of the head. Ensure the environment is appropriately warm. Bubble wrap may be placed over the newborn’s body to maintain warmth.

Preterm infants

- Preterm infants may experience greater difficulty in establishing and maintaining effective respiration due to incomplete maturity of the lungs.
- Very premature newborns < 32 weeks’ gestation are particularly at risk of hypothermia.
- If the infant is < 32 weeks’ gestation, or has an estimated birth weight < 1500 grams, place the newborn into a polyethylene (Glad™ zip lock) bag. The newborn’s head should protrude from a hole cut into the top of the bag. The head should be dried and covered with a hat or blanket as above. Zip-lock the bag below the newborn’s feet.
- If paramedics are present at the birth, this should occur immediately without drying the newborn while the infant is still wet and warm. If paramedics arrive after the birth, the newborn should be dried
first as the newborn will be hypothermic.

**Suction**

- Routine suction is not required in vigorous newborns, even if the infant was born through meconium stained amniotic fluid. Newborns generally clear their own airways very effectively. Excessive suctioning may delay onset of respiration and induce bradycardia. Suction is only indicated when airway obstruction is suspected.

**Cutting the cord**

- Vigorous newborn: Cutting the cord in the vigorous newborn is not urgent. Wait until the cord has stopped pulsating (approximately 1-2 minutes) unless parental preference is to remain attached (e.g. Lotus birth)
- Non vigorous newborn: Paramedics should prioritise resuscitation (e.g. IPPV). Cutting the cord earlier may be required to facilitate resuscitation if access to the newborn is compromised by the intact cord.

**Tertiary Centres**

- Monash Children’s Hospital (MCH), Mercy Hospital for Women (MHW), Royal Women’s Hospital, Parkville (RWH) and Royal Children’s Hospital (RCH).
- Paramedics should consult with PIPER where transfer time to a tertiary centre is prolonged. Transfer to a closer hospital followed by retrieval by PIPER may be appropriate.
Flowchart

**Status**
- Birthed, dried, skin to skin with mother

**Assess**
- Breathing
- Muscle tone

**Breathing adequately and good muscle tone**

✓ **Action**
- Continue to dry (especially the head)
- Maintain warm (skin-to-skin, blankets, hat)
- Routine suction is not recommended
- Monitor HR (auscultation), breathing, tone and colour
- If vital signs deteriorate or airway is obstructed at any stage, manage as per CPG N0201 Newborn resuscitation

**Apnoeic or gasping or no muscle tone**

✓ **Action**
- Non vigorous newborn
- Manage as per CPG N0201 Newborn resuscitation

**Transport**

✓ **Action**
- > 36 weeks’ gestation, uncomplicated delivery, stable vital signs
  - Tx to appropriate maternity service (e.g. pre-booked hospital)
- 32 – 36 weeks’ gestation AND stable vital signs
  - Tx to a level 2 hospital (paediatrician and midwife on site 24/7) in consultation with PIPER
- < 32 weeks’ gestation, or unstable vital signs
  - Tx to tertiary centre in consultation with PIPER

**Normal newborn: Resuscitation not required**

✓ **Action**
- Cut cord once cord has stopped pulsating (approx 1-2 min) unless parental preference is to remain attached
- Note APGAR when practicable

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
APGAR should not be used as a guide for resuscitation. The time intervals used for resuscitation are contained elsewhere within this CPG.

The APGAR should be conducted at 1 minute and 5 minutes post birth, then repeated at 5 minute intervals until APGAR score > 7.

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Blue / pale</td>
<td>Body pink, extremities blue</td>
<td>Totally pink</td>
</tr>
<tr>
<td><strong>Pulse</strong></td>
<td>Absent</td>
<td>&lt; 100</td>
<td>&gt; 100</td>
</tr>
<tr>
<td><strong>Grimace</strong></td>
<td>None</td>
<td>Grimaces</td>
<td>Cries</td>
</tr>
<tr>
<td><strong>Activity</strong></td>
<td>Limp</td>
<td>Extremity flexion</td>
<td>Active motion</td>
</tr>
<tr>
<td><strong>Respiratory Effort</strong></td>
<td>Absent</td>
<td>Weak / gasping / ineffective</td>
<td>Strong cry</td>
</tr>
</tbody>
</table>

7 - 10 Satisfactory  
4 - 6 Respiratory depression, may require ventilation  
0 - 3 Requires ongoing resuscitation
Effective ventilation is the key to newborn resuscitation

The majority of newborns requiring resuscitation are apnoeic and bradycardic due to ineffective ventilation. Prioritise establishing and maintaining effective ventilation at each stage of resuscitation. Improvement in heart rate (> 100 bpm) is the best indicator of effective ventilation.

**Care Objectives**

**General Notes**

- Ventilation should be initiated within the first 60 seconds of management in the non-vigorous newborn.
- Initial ventilation should occur without supplemental oxygen, at a rate of 40 – 60 per minute and with enough pressure to see chest rise.
- Where appropriate equipment is available, apply PEEP (5 cmH₂O) whenever positive pressure ventilation is being provided.
- Where the heart rate remains 60 – 100 bpm after 30 seconds of effective ventilation on room air, paramedics should ensure adequate mask seal, and airway position and increase ventilation pressure. Where heart rate remains < 100, 100% oxygen (5L/min) should be provided.
- Once heart rate is > 100 bpm and target saturations are being met, oxygen should be weaned to avoid hyperoxaemia.
- Where the heart rate is < 60 bpm despite at least 30 seconds of effective ventilation, CPR with 100% oxygen is required.

**Indications for withholding resuscitation**

- Resuscitative efforts should be withheld in infants < 23 weeks’ gestation as there is no possibility of successful resuscitation. Where there is any doubt as to the gestation of the newborn, paramedics should attempt resuscitation and consult with PIPER.
- While resuscitative efforts may not be required, it is a legal requirement in Victoria that any infant born at ≥ 20 weeks’ gestation or ≥ 400 g birth weight OR showing signs of life regardless of gestation, be registered by a hospital, medical facility or midwife. There is no requirement that miscarriages < 20 weeks’ gestation be reported to the coroner or police unless the loss of pregnancy has occurred due to violence or injury.

**Airway**

- The head and neck should be placed in the neutral position. Avoid both neck flexion and excessive head extension. This will likely require placing a folded towel or blanket underneath the shoulders.
Suction

- Suction is only required where the airway is obstructed. The mouth should be suctioned first, followed by the nose. The newborn is a nasal breather and may gasp and inhale pharyngeal fluid if the nose is cleared first.

- Suction should be gentle, brief (5 - 6 seconds) and no deeper than the oropharynx (measured from the tragus to the corner of the mouth) to avoid laryngospasm and bradycardia.

- A size 10 or 12 FG catheter with approximately < 100 mmHg (< 13 kPa, 133 cm H₂O or approximately 1 quarter of recommended adult pressure) of suction should be applied. Only apply suction as the catheter is being withdrawn.

- If the newborn is intubated, consider tracheal suction only if a lower airway obstruction (e.g. meconium or blood) is suspected.

Advanced airway

- OPAs are not recommended for routine use as they may cause airway obstruction and vagally mediated bradycardia. A size 0 may be useful where airway abnormalities or the newborn’s tongue impede effective ventilation.

- Colorimetric EtCO₂ detectors should be used for all newborns requiring intubation. Continuous waveform EtCO₂ monitors may provide inaccurate readings due to small tidal volumes (5 - 10 mL/kg).

<table>
<thead>
<tr>
<th>ETT size (mm)</th>
<th>Lip length (wt in kg + 6 cm)</th>
<th>ETT suction catheter</th>
<th>NG tube</th>
<th>Laryngoscope blade</th>
<th>i-Gel</th>
<th>Suction catheter (negative pressure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 kg or &lt; 28 wks ‘extremely preterm’</td>
<td>2.5</td>
<td>6 – 7 cm</td>
<td>6 FG</td>
<td>6 FG</td>
<td>00 straight Miller blade</td>
<td>None</td>
</tr>
<tr>
<td>1-3 kg or 28 – 34 wks ‘moderately preterm’</td>
<td>3</td>
<td>7 – 9 cm</td>
<td>6 FG</td>
<td>8 FG</td>
<td>0 or 1 straight Miller blade</td>
<td>None</td>
</tr>
<tr>
<td>&gt; 3 kg or ≥ 35 wks ‘term or near term’</td>
<td>3.5</td>
<td>9 – 10 cm</td>
<td>6 FG</td>
<td>8 FG</td>
<td>0 or 1 straight Miller blade</td>
<td>Size 1.0 for &gt;2 kg</td>
</tr>
</tbody>
</table>

Heart rate and ECG monitoring

- Heart rate is routinely measured by auscultation in the vigorous newborn. In the non-vigorous newborn, requiring resuscitation, ECG electrodes should be placed to guide resuscitation. Measuring heart rate by auscultation is preferred in extremely preterm newborns (< 28 weeks) as the electrodes may damage their skin.

- Shockable rhythms are extremely rare in newborns. Should these rhythms be observed, apply multifunction electrode pads and defibrillate in manual mode using 4 J/kg at 2 minute intervals.
**Pulse oximetry**

- Attach to the right hand or right wrist (pre-ductal). See CPG N0101 The newborn baby for normal values post birth. SpO₂ significantly lower than these values may guide the use of supplemental oxygen.
- Obtaining a reliable SpO₂ trace in newborns can be problematic. Consider SpO₂ strength of waveform and overall patient condition in determining the reliability of SpO₂ reading.

**CPR**

- 3:1 compression to ventilation ratio.
- Achieve 90 compressions and 30 ventilations per minute with a 0.5 second pause for ventilation (120 events per minute).
- Compression depth should be approximately 1/3 the depth of the chest.
- The two thumb, hand encircling technique (below left) is preferred. The two-finger technique (below right) may be performed if access to the tibia for IO insertion is required.

**Single rescuer**

- In single rescuer scenarios, the focus should be on providing effective positive pressure ventilation until back-up arrives. Attempting to perform ECC and PPV at 3:1 as a single operator is unlikely to be effective in restoring heart rate.
Flowchart

**Status**
- Birthed, dried, skin to skin with mother

**Assess**
- Breathing
- Muscle tone (flexed arms and legs)

**Apnoea or gasping or no muscle tone**

**Action**
- Stimulate by drying (not more than 30 secs)
- Maintain warmth
- Place supine with head/neck in neutral position
- Suction only if airway obstruction is suspected

**Assess**
- Breathing
- Heart rate (auscultate or ECG)

**HR < 100 and/or apnoea or gasping**

**Action**
- IPPV @ 40 – 60 per minute on room air
- Pulse oximetry (right hand or right wrist)
- ECG monitoring if not already attached
- Reassess after 30 seconds

**Assess**
- Heart rate and breathing
- Reassess every 30 seconds and change management accordingly

**HR < 60**

**Action**
- CPR @ 3:1 ratio with oxygen (5 L/min)
- Consult with PIPER for all infants with HR < 60
  - If HR < 60 persists after 30 seconds CPR: Intubate as required
  - If HR < 60 persists despite adequate ventilation:
    - Adrenaline 10 mcg/kg IV/IM 4 minutes
  - If HR < 60 persists despite adequate ventilation and adrenaline:
    - Normal saline 10 – 20 mL/kg
    - Repeat if necessary

**HR 60 – 100**

**Action**
- IPPV @ 40 – 60 per minute
- Ensure adequate mask seal, airway position and increase ventilation pressure targeting chest rise
- If no increase in heart rate:
  - IPPV with oxygen 5 L/min

**HR > 100, but SpO2 < 90%**

**Action**
- Breathing laboured:
  - IPPV at 40-60 per minute
  - Titrated oxygen (1 – 5L/min) to meet target saturations
- Breathing normally:
  - Maintain warmth and Tx as per CPG N0101 The newborn baby
  - Titrated oxygen 1 – 2 L/min via nasal cannula to meet target saturations
  - Discontinue oxygen where SpO2 > 90%

- Assess BG (do not delay transport)
- If BG < 2.6 mmol/L, consult with PIPER for administration of 10% Dextrose or Glucagon
The intent of the Treat and Refer CPGs is to provide the patient with the most appropriate care for their clinical condition. Paramedics should involve the patient in the decision-making process and explain the rationale for self-care and/or referral. If the patient does not provide informed consent for out-of-hospital management then other alternatives should be considered. In some cases it may be appropriate for patients to be transported to hospital by other means.

The Treat and Refer CPGs only apply to adult patients:
- Elderly / frail patients have a higher risk of deterioration or serious pathology and are not currently covered by these CPGs.
- Paediatric patients are not currently covered by these CPGs.

The Treat and Refer CPGs cover selected common clinical conditions. Other conditions may also be appropriate for self-care and/or referral to an alternative care provider. These options should be reserved for stable patients with simple, isolated conditions that are unlikely to require hospital management.

The Treat and Refer pathway does not replace Paramedic clinical judgement. Transport should still be provided if there are reasonable concerns or doubts about:
- The nature or severity of the patient’s condition, or if multiple issues exist.
- Patient (or carer) ability to self-care or seek further assistance.
- Availability or appropriateness of alternative care providers, particularly if a direct referral is not made.
- Any other factors that are of concern to the Paramedic.

At the time of approval of this CPG, a number of initiatives are being developed to assist Paramedics with patient referral (such as the In-Field Referral Project). These services can be utilised where appropriate.

When providing advice and/or referral to patients and their carers, paramedics should take into account:
- Underlying anxiety and distress of the patient / carer.
- Barriers to communication e.g. language.
- Health literacy and ability to follow recommendations.

AV Health Information Sheets are an important part of the Treat and Refer pathway. Patients with written instructions are more likely to retain and follow the advice given by Paramedics. Where available they should be provided to all patients as appropriate.

Paramedics who are unsure of the specific advice to provide for a minor condition should refer the patient to the appropriate health professional e.g. GP, pharmacist, physiotherapist.
Flowchart

**Status**
- Patient thoroughly assessed and managed as appropriate
- Does not require immediate transport to hospital

**STOP**
- Paediatric, elderly, or frail patients are not currently covered by the Treat and Refer CPGs
- Consider other factors that may increase patient risk if not transported e.g. abnormal vital signs, significant co-morbidities, inability to self-care

**Assess**
Is patient covered by a specific Treat and Refer CPG?

**Yes**
- Action
  - Apply specific Treat and Refer CPG as appropriate
  - Ensure patient understands the advice and provides informed consent for the referral process. The patient should be provided with the relevant Health Information Sheet, where appropriate.

**STOP**
- If referral to an alternative care provider is not available within a clinically appropriate timeframe OR
- If the patient withdraws consent to the referral process

**Action**
Consider alternative plan or organise appropriate transport to ED

**No**
- Action
  - If the patient condition is not covered by a specific treat and refer guideline, treat as per usual standard of care.
Approximately 5% of epistaxis cases originate from the posterior area of the nose which are unlikely to be controlled with manual pressure.

Posterior or anterior bleeding that is unable to be controlled with manual pressure will require further medical management, which may include application of topical vasoconstrictors, cauterisation, nasal packing and/or surgery.

Consider transporting patients where epistaxis has resulted from trauma (e.g. fall, assault, sporting injury) as there may be other injuries present.

Examples of anticoagulant medications include warfarin, dabigatran, rivaroxaban and apixaban.

There are a number of conditions that can impair the blood clotting process. Examples of bleeding disorders include haemophilia and Von Willebrand Disease.

If the patient does not require active management or monitoring by paramedics then alternative methods of transport to hospital may be considered if available within a reasonable timeframe.

Initial management of epistaxis involves positioning the patient upright with slight forward neck flexion. Ask the patient to pinch the soft part of their nose firmly for fifteen minutes, without releasing pressure. Some patients may require assistance. If bleeding does not cease continue to pinch the nose as before.

If available, a cold cloth or cold compress may be applied to the forehead.

Encourage patient to breathe through their mouth and to spit out any blood collecting in their mouth.

Patients should avoid blowing or picking their nose for at least 12 hours after cessation of bleeding.
Flowchart

- **Status**
  - Epistaxis

- **STOP**
  Do not proceed if:
  - Unable to control bleeding after 15 minutes
  - Recent history of facial or head trauma
  - History of bleeding disorder or anticoagulant therapy

- **Assess**
  - Has bleeding been controlled after 15 minutes of direct pressure application?

- **Yes**
  - **Action**
    - If bleeding stops completely, provide patient with self-care advice and Health Information Sheet
    - Confirm that patient understands the advice given prior to departing the scene
    - Refer patient to primary care provider for review within 24 hours if:
      - Very minor or intermittent bleeding remains
      - Patient has experienced recurrent episodes of epistaxis
      - Patient is on antiplatelet therapy
      - BP remains high after resolution of epistaxis

- **No**
  - **Action**
    - If bleeding continues (constant flow when pressure is released), transport patient to ED
For the purpose of this CPG, a patient can be suspected to have gastroenteritis because they present with acute onset of diarrhoea (≥ 3 loose or fluid bowel motions over 24 hours). Associated symptoms may include nausea and vomiting, abdominal cramping, lethargy and fever.

Examples of signs of significant dehydration are listed in CPG A0701 Nausea and vomiting.

The presence of blood in the stools or vomit may indicate bacterial / parasitic infection or GIT haemorrhage.

Patients with a high BGL are also likely to be significantly dehydrated. A hyperglycaemic emergency (e.g. diabetic ketoacidosis) can also mimic symptoms of gastroenteritis.

Diarrhoea is a non-specific symptom. Non-infectious causes of diarrhoea include medications, food intolerances and other disorders of the GIT. Patients with symptoms lasting > 48 hours should be referred on for further investigation.

Patients who have recently returned from overseas should be referred to a GP for further investigation to exclude potentially serious infectious diseases.

Paramedics should utilise all PPE and take appropriate precautions when assessing and managing suspected gastroenteritis patients. The risk of transmission of disease is not a valid reason for a non-transport decision if transport is clinically required.

Patients with potential differential diagnoses (e.g. inflammatory bowel disease) or who are at higher risk of complications may not require emergency ambulance transport if they are otherwise well. Alternative methods of transport to hospital may be considered if available within a reasonable timeframe and the patient does not require active management or monitoring by Paramedics.
Most cases of gastroenteritis in adults are caused by viral infection. Symptoms will usually resolve within a few days without the need for specific treatment.

Patients should be referred to their local pharmacist or GP for further advice and management.

The principle treatment for gastroenteritis is maintaining adequate hydration with water or commercial oral rehydration preparations (such as Gastrolyte or Hydralyte). “Sports” drinks should be avoided as these contain a different balance of sugar and electrolytes which can impair rehydration.

If required, anti-diarrhoea medication can be purchased from a pharmacy after consultation with a pharmacist.

Antibiotics are only indicated if a bacterial or parasitic infection is suspected. These patients generally present with a high fever (>40°C), severe abdominal cramping and bloody diarrhoea and should be referred for further investigation.

Encourage patients to maintain good hygiene practices including regular hand washing, minimising food handling and regular cleaning of potentially infected materials and surfaces. As a general guide attendance at work or school should be avoided until 48 hours after symptoms cease.

Patients should be advised to seek further medical attention if, after 48 hours from onset their symptoms are not improving, or have actually worsened.

If Ondansetron is administered, inform patient and / or carer of potential for extrapyramidal adverse effects and to call an ambulance immediately if this occurs.
Flowchart

**Status**
- ≥ 3 loose or fluid bowel motions within 24 hours

**STOP**
Do not proceed if:
- Patient requires timely hospital assessment and/or management:
  - Significant dehydration requiring IV fluid rehydration
  - Potential GIT bleeding (e.g., haematemesis, melena, PR bleeding)
  - Severe and constant abdominal pain
  - BGL > 17 mmol/L
- Symptoms may be due to a differential diagnosis:
  - Absence of diarrhoea
  - Past history of inflammatory bowel disease (e.g., Crohn’s disease, ulcerative colitis)
- Patient has a higher risk of complications:
  - Pregnancy
  - Co-morbidities (e.g., diabetes, immunocompromised)
* If appropriate, alternative methods of transport to ED may be considered

**Assess**
- Is Pt appropriate for self-care and initial management at home?

**Action**
- Provide patient with self-care advice and Health Information Sheet
  - Provide oral rehydration formula if appropriate
  - Refer patient to pharmacist for further advice and medications
- Refer patient to GP for review if
  - Symptoms do not improve after 48 hours
  - Patient has recently returned from overseas
  - Temperature > 40°C
- If nausea and vomiting is severe, consider a single dose of **Ondansetron 4 mg ODT orally** as per CPG A0701 Nausea and Vomiting
- Confirm that patient understands the advice given prior to departing the scene

**Action**
- Organise appropriate transport to ED
There are a number of studies indicating that isolated heroin overdose patients are at low risk if not transported, providing that they have fully recovered after a single dose of Naloxone.

The same evidence does not exist for overdose on other opioids due to their variable duration of action when compared to the relatively short action of Naloxone.

The incidence of isolated heroin overdose is decreasing in Australia, with corresponding increases in prescription opioid abuse and polypharmacy overdose. Co-administration of other substances such as alcohol, benzodiazepines and other sedating agents increases the risk of harm to the patient and will generally require hospital monitoring and management.

**General Care**

- Manage heroin overdose as per CPG A0707 Overdose: Opioids.
- This guideline ONLY applies to confirmed or suspected cases of isolated heroin overdose. Suspicion can be based on evidence of heroin use (which should subsequently be documented) or information from the patient or bystanders.
- There may be a cohort of opioid overdose patients who may be resistant to transport, even if transport is recommended as per this CPG. These patients should still be provided advice on local social and drug support resources and provided with a Health Information Sheet if good rapport can been established. At no stage are Paramedics expected to put themselves at risk in implementing this guideline.
- It should not be assumed that all opioid overdose patients will be resistant to follow-up care.
Flowchart

**Status**
- Patient presents as (or confirms that they are) an isolated heroin overdose, which has responded to Naloxone with full recovery

**STOP**
- Do not proceed if:
  - There is an incomplete recovery, e.g., GCS <15, RR <10
  - Patient has required a second dose of Naloxone to achieve full recovery
  - Patient confirms or is suspected of taking an opioid other than heroin
  - Patient confirms or is suspected of being a polypharmacy overdose, with special concern regarding alcohol, benzodiazepines or other sedating agents
  - There are other potential contributing factors to the initial altered consciousness, e.g., hypoglycaemia, infection, trauma, etc
  - Any suspected/reported seizure during the episode
  - Suspected aspiration or APO
  - Pregnancy
  - Patient is potentially a risk to self or others

**Assess**
- Is patient’s chest clear on auscultation?
- Is the patient’s SpO2 >94% on room air?
- Is patient fully recovered, deemed low risk and can be supervised by a competent adult for 4 hours?

**Yes**
- Advise patient of risks of relapse if an opioid is taken within the next 6 hours
- Advise patient of need to avoid all sedating agents (e.g., alcohol, benzodiazepines, antipsychotics) whilst still drug-affected
- Advise patient of local social and drug support resources if appropriate
- Provide patient and/or carer with self-care advice and Health Information Sheet
- Confirm patient and/or carer understands the advice given prior to departing scene

**No**
- The preferred option if there is any respiratory compromise is transport to ED for follow-up if patient will accept the offer
- Consider transport to primary care provider or drug support service if patient refuses transport to ED or has recovered but has no supervision

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This is an uncontrolled document, it is the reader's responsibility to ensure currency.
This CPG is intended for adult patients with diagnosed diabetes who have fully recovered from an episode of hypoglycaemia.

There is often a clear cause that triggers a hypoglycaemic episode, such as a missed meal or strenuous exercise. However in patients with poorly controlled diabetes, hypoglycaemia can still occur without a readily identifiable cause.

Hypoglycaemia is a common adverse effect of oral hypoglycaemic medications. Due to their long duration of action, there is a risk of recurrent hypoglycaemia if a patient on oral hypoglycaemics is left at home.

Patients who have overdosed on diabetes medication(s) require monitoring and management in hospital as well as investigation into the reason behind the overdose.

Hypoglycaemia in patients without a history of diabetes may be triggered by a potentially serious condition such as drug / alcohol overdose, liver or endocrine disease, tumour, sepsis or malnourishment.

Special Notes

- Manage hypoglycaemia as per CPG A0702 Hypoglycaemia.
- Following resolution of hypoglycaemia the patient should be given a longer-acting carbohydrate to prevent recurrent hypoglycaemia. Suitable options include a sandwich, dried fruit or yoghurt.
- Remind patient of appropriate sources of glucose to consume for future episodes of hypoglycaemia:
  - 6 to 7 jelly beans
  - 1 tablespoon of honey
  - 200 mL of fruit juice
  - 150 to 200 mL of soft drink (not “diet” or “zero”)
  - 20 g of glucose tablets
- Advise patient to inform their usual diabetes provider (e.g. GP, endocrinologist, diabetes educator) about their hypoglycaemic episode within 24 hours, particularly if hypoglycaemia is becoming more frequent.

General Care
Minor Burns

Superficial Burns

- **Superficial** burns only involve the epidermal layer of the skin. Common characteristics include:
  - **Appearance**: Dry and red, no blisters, skin not broken
  - **Sensation**: May be painful
  - **Circulation**: Normal or increased
  - **Colour**: Red, warm
  - **Blisters**: None (or appears days later)

Partial / Full-thickness burns

- **Partial or full-thickness** burns have the following characteristics:
  - **Appearance**: Pale pink / white / black
  - **Sensation**: Increased sensation to no sensation
  - **Circulation**: Rapid capillary refill to no circulation
  - **Colour**: Pink / white / charred / black
  - **Blisters**: Yes (partial), no (full-thickness)

Partial / full-thickness burn management is not covered by this CPG.

- Sunburn may involve a larger area of skin, but may be appropriate for self-care or referral if the patient is otherwise well.

General Care

- Provide cooling with cool running water for 20 minutes as per CPG A0805 Burns.

- After initial cooling the burn area can be gently cleaned with gauze and 0.9% Normal Saline.

- If available a soothing gel such as a non-perfumed moisturiser can be applied to superficial epidermal burns e.g. Vaseline, sorbolene. Gels or creams should not be applied to any burn with broken skin.

- No other dressing is required for superficial burns.

- Patient should be referred to a GP for review within 24 hours.

- Epidermal burns generally heal within 7 days without scarring.

- If required, **Paracetamol** can be administered for pain relief as per CPG A0501 Pain Relief.
Flowchart

**Status**
- Small, isolated, superficial burn with unbroken skin
- Sunburn

**STOP**
Do not proceed if:
- Burn involves a sensitive area: face, hands, feet, major joints, genitalia or circumferential burns of a limb or chest
- Partial or full thickness burn
- Smoke inhalation or potential inhalation injury
- Chemical, electrical or radiation burn (other than sunburn)
- Suspected non-accidental burn
- Associated traumatic injuries
- Pain unable or unlikely to be controlled by oral analgesia
- Co-morbidities that may impair wound healing *
  - e.g. Hx of poor wound healing, diabetes, immunocompromised, chronic steroid use
* If appropriate, alternative methods of transport to ED may be considered

**Assess**
- Has pain been controlled after 20 minutes of cooling and is burn superficial and minor?

**Yes**
- If required, clean wound gently with Normal Saline
- Consider applying non-perfumed moisturiser if available (e.g. Vaseline, sorbolene etc.)
- Consider Paracetamol as per CPG A0501 Pain Relief
- Refer patient to primary care provider within 24 hours for review
- Provide Health Information Sheet and confirm patient understands advice given prior to departing scene

**Action**

**No**
- Organise appropriate transport to ED or primary care provider

**Action**
This CPG is intended for adult patients who have sustained minor wounds (e.g. incisions, lacerations, abrasions / grazes), where bleeding is controlled and there are no other significant injuries.

- Paramedics should consider the mechanism of injury when assessing a patient and lower their threshold for transport if the mechanism could potentially result in more serious injury.
- Patients who meet any of the exclusion criteria in this CPG should be transported to hospital as their wounds are likely to require specialised management and / or potential plastic surgery.
- Patients with wounds potentially requiring plastic surgery referral, or wounds at risk of infection or impaired healing may not require emergency ambulance transport. Where appropriate, alternative methods of transport may be considered if available within a reasonable timeframe and the patient does not require active management or monitoring from paramedics.

**Special Notes**

- Irrigate wound(s) with Normal Saline and dress with a moistened Combine dressing.
- Small incisions, lacerations or abrasions that appear to be free from foreign matter and are not actively bleeding can alternatively be dressed with a film dressing e.g. Tegaderm or Opsite.
- **Paracetamol** is appropriate to treat mild pain if required as per CPG A0501 Pain Relief.
- Many wounds are caused by non-sterile agents and should be considered to be potentially contaminated. Patients who are not transported to hospital should be referred to a GP or practice nurse as soon as possible to ensure the wound is appropriately cleaned, debrided and closed. Patients may also require tetanus and / or antibiotic prophylaxis.
- If patients are being referred to a GP or nurse for wound management, Paramedics should confirm that they are able to provide this service. It should not be assumed that all medical clinics are able to provide wound management.
- Wounds requiring closure (e.g. sutures) should be ideally attended to within 6-10 hours of initial injury. If a significant delay is anticipated before the patient can access alternative care then they should be referred to ED.
Flowchart

**Status**
- Minor wound(s) e.g. incision, laceration, abrasion / graze

**STOP**
- Do not proceed if:
  - Wound requires acute hospital management:
    - Uncontrolled serious bleeding
    - Neurovascular impairment or loss of function
    - Penetrating injury, degloving or crush injuries
    - Other injuries requiring hospital management e.g. compound fracture
    - Pain unable or unlikely to be controlled by oral analgesia
    - Suspected non-accidental injury or self harm attempt
  - Wound potentially requires plastic surgery referral *
    - Wounds to special areas: face, hands, feet, joints, genitals or pre-labial area
    - Suspected muscle or tendon damage
  - Wound at risk of infection or impaired wound healing *
    - Foreign material unable to be cleaned out of wound e.g. dirt, glass, gravel
    - Bite wounds (animal or human)
    - Wound > 6 hours old
    - Signs of infection
    - Co-morbidities e.g. diabetes, peripheral vascular disease, immunocompromised

* If appropriate, alternative methods of transport to ED may be considered

**Assess**
- Has bleeding been controlled and is patient able to access primary care provider for further wound management?

**Action**
- Irrigate and dress wound(s) as appropriate
- Refer patient to primary care provider for follow up as soon as possible for further wound management
  - Confirm that primary care provider is able to provide this within an appropriate timeframe (ideally within 6 hours of injury)
- Consider **Paracetamol** as per **CPG A0601 Pain Relief**
- Provide patient with Health Information Sheet and confirm the patient understands the advice given prior to departing the scene

**Action**
- Organise transport to ED or primary care provider for further management

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
This CPG is intended for adult patients with diagnosed epilepsy who have experienced a single, uncomplicated seizure with full recovery to their normal conscious state.

Patients who meet any of the exclusion criteria in this CPG should be transported to hospital for further investigation and monitoring. Continue management as per CPG A0703 Seizures or other appropriate CPG.

Transport to hospital is not necessarily indicated if a patient has been administered medication (e.g. buccal midazolam or rectal diazepam) according to their Epilepsy Management Plan and has subsequently recovered. Consult their individual plan for guidance.

Consider eclampsia in patients with new onset seizures in the second half of pregnancy. Manage as per CPG A0703 Seizures and CPG O0202 Pre-eclampsia / Eclampsia.

Special Notes

• Provide initial management as per CPG A0703 Seizures.

• Patients may have their own written Epilepsy Management Plan. If available Paramedics should consult this when making decisions regarding treatment, referral or transport.

• If not transported, advise patient to inform usual primary care provider (e.g. GP or specialist) of event within 24 hours.

• Advise patient’s carer / family to call an ambulance if:
  - Seizure recurs before patient is reviewed by doctor.
  - Future seizures do not stop after 5 minutes OR are different to usual presentation.
  - Seizure continues despite following Epilepsy Management Plan.
  - Patient sustains injury, vomits, or is immersed in water during seizure.
  - Patient has not regained consciousness or is taking longer to wake up than usual.
  - Carer / family have any other concerns and require advice.

General Care
Flowchart

**Status**
- Single seizure with full recovery

**STOP**
Do not proceed if:
- Patient requires further assessment or management in hospital
  - Incomplete recovery (to normal conscious state)
  - Suspected non-epileptic cause of seizure e.g. hypoglycaemia, stroke, hypoxia, OD
  - No diagnosis of epilepsy / first-presentation seizure
  - Different to usual presentation (e.g. different type, prolonged or more frequent)
  - Concurrent illness (e.g. infection)
  - Injury, aspiration and/or submersion sustained
  - Patient has been administered Midazolam (other than patient’s own)
- Seizure was unwitnessed
- Risk of recurrent seizure if patient left on scene:
  - History of multiple seizures per episode
  - Patient has feeling of impending seizure
  - Patient is unable to be monitored by a responsible adult
- Pregnancy
- Patient requests transport for further investigation

**Assess**
- Has Pt fully recovered and is able to be monitored by a responsible adult?

**Yes**
- Provide patient and / or carer with self-care advice and Health Information Sheet
- Refer patient to usual primary care provider within 24 hours
- Use patient’s own Epilepsy Management Plan for guidance if available
- Confirm patient and / or carer understands the advice given prior to departing scene

**No**
- Transport directly to ED
Special Notes

- This CPG is intended for adult patients who have sustained an isolated soft tissue injury as a result of minor trauma and have no obvious fracture or dislocation.
- Paramedics should consider the mechanism of injury when assessing a patient and lower their threshold for transport if the mechanism could potentially result in more serious injury.
- Where appropriate, transport to hospital by alternative methods may be considered if available within a reasonable timeframe and the patient does not require active management or monitoring by Paramedics during transport.
- The Ottawa Ankle Rules are a tool to assess foot and ankle injuries in adult patients (>18 years) to determine the requirement for radiography. They should be utilised on appropriate patients to help inform the management plan. Refer to CPG A0110 Ottawa Ankle Rules for instructions.

General Care

- The principles of management for soft tissue injury include “RICE” during the first 48-72 hours:
  - R Rest
  - I Ice (15 - 20 minutes every 1 - 2 hours when awake)
  - C Compression
  - E Elevation and also avoiding “HARM” in the first 48 - 72 hours:
    - H Heat (increases blood flow and swelling)
    - A Alcohol (increases blood flow and swelling)
    - R Reinjury
    - M Massage (promotes blood flow and swelling)

- Paracetamol is appropriate to treat mild to moderate pain. Refer patient to a pharmacist or GP for advice on other painkillers including anti-inflammatory medications, as these may not be suitable for all patients.
- Referral to a physiotherapist may also be beneficial to assist the recovery process.
Flowchart

**Status**
- Isolated soft tissue injury with no obvious fracture / dislocation

**STOP**
- Do not proceed if:
  - Evidence of significant fracture or dislocation (e.g. crepitation, deformity, unnatural movement)
  - Neurovascular impairment
  - Pain unable or unlikely to be controlled with oral analgesia
  - Suspected non-accidental injury
  - For isolated ankle / foot injury only – positive Ottawa Ankle Rule

**Assess**
- Is the patient able to ambulate and access primary care provider for further management?

- **Yes**
  - **Action**
    - Provide patient with self-care advice
      - RICE and avoid HARM
      - Splint or bandage as appropriate
    - Refer patient to follow up with primary care provider for review within 24 hours
    - Consider Paracetamol as per CPG A0501 Pain Relief
    - Provide patient with Health Information Sheet and confirm patient understands the advice given prior to departing scene

- **No**
  - **Action**
    - Organise appropriate transport to ED or primary care provider for follow-up
Special Notes

- This CPG is intended for adult patients presenting with lower back pain that is suspected to have been caused by a minor mechanical injury (e.g. lifting, bending or twisting of the back). For the purposes of this CPG, acute pain is defined as < 4 weeks duration.

- Patients with undiagnosed back pain of > 4 weeks duration should be referred to a GP for further investigation.

- Approximately 1% of cases of acute lower back pain are due to a serious medical aetiology requiring further investigation in hospital.

- Cauda equina syndrome arises from compression of nerve roots in the lower spinal cord. Signs and symptoms include “saddle” anaesthesia (altered sensation around groin and inner thigh area), incontinence and leg weakness or numbness.

- The risk of vertebral fracture is increased in patients with osteoporosis, chronic steroid use or those who have sustained a significant traumatic injury.

- Acute severe back pain may be a symptom of a dissecting aortic aneurysm.

- Back pain that does not improve can be a symptom of cancer particularly in older patients.

- Patients with weakened immune function (e.g. IV drug use, immunocompromised) are at risk of vertebral infection.

- Patients with back pain suspected as being secondary to cancer or suspected vertebral infection require investigation in hospital but may not require emergency ambulance transport. Where appropriate, alternative methods of transport may be considered if available within a reasonable timeframe and the patient does not require active management or monitoring by Paramedics.

General Care

- Most cases of acute non-specific lower back pain can be managed in the primary care setting.

- Patients should be referred to their GP or physiotherapist for further advice and management.

- Advise patient to self-medicate with regular Paracetamol until they are reviewed if there are no contraindications. If required, the initial dose can be administered by Paramedics as per CPG A0501 Pain Relief.

- Refer patient to a pharmacist or GP for advice on other analgesic agents including anti-inflammatory medications, as these may not be suitable for all patients.

- Advise patient to maintain gentle exercise (e.g. walking) as their pain allows and to avoid resting for long periods of time. The use of heat packs may also be of benefit.
Flowchart

STOP

Do not proceed if:
- Pain not isolated to lower back area e.g. chest, abdominal, lower limb pain
- Suspected cauda equina syndrome
  - Loss of bladder or bowel control
  - Saddle anaesthesia
- Lower limb weakness or numbness
- Suspected vertebral fracture
  - Hx of fall or significant trauma
  - Hx of osteoporosis or chronic steroid use
- Suspected dissecting aortic aneurysm
- Pain unable or unlikely to be controlled by oral analgesia
- Back pain suspected to be secondary to cancer *
  - Past Hx of cancer or recent unexplained weight loss
- Suspected vertebral infection *
  - Fever or recent Hx of infection
  - Hx of IV drug use
  - Immuno-compromised

* If appropriate, alternative methods of transport to ED may be considered

Assess

- Is patient able to ambulate and access alternative care for further management?

Action

- Provide patient with self-care advice
  - Maintain mobility, avoid extended rest
  - Regular oral analgesia until review
- Consider Paracetamol as per CPG A0501 Pain Relief
- Refer patient to primary care provider for review within 24 hours
- Provide patient with Health Information Sheet and confirm patient understands the advice given prior to departing scene

Action

- Organise appropriate transport to ED or primary care provider
### Adenosine CPG D032

**Presentation**

| 6 mg in 2 mL glass ampoule |

**Pharmacology**

| A naturally occurring purine nucleoside found in all body cells |
| Slows conduction through the A-V node, resulting in termination of re-entry circuit activity within or including the A-V nodal pathway |

**Metabolism**

| By adenosine deaminase in red blood cells and vascular endothelium |

### Pharmacology

**Actions:**

| Slows conduction through the A-V node, resulting in termination of re-entry circuit activity within or including the A-V nodal pathway |

### Metabolism

| By adenosine deaminase in red blood cells and vascular endothelium |

### Primary emergency indications

| 1. AVNRT with adequate or inadequate perfusion but not deteriorating rapidly |
| 2. AVRT and associated Wolff-Parkinson-White (WPW) or other accessory tract SVT with adequate or inadequate perfusion but not deteriorating rapidly |

### Contraindications

| 1. Second degree or third degree A-V block (may produce prolonged sinus arrest / A-V blockade) |
| 2. AF |
| 3. Atrial flutter |
| 4. Ventricular tachyarrhythmias |
| 5. Known hypersensitivity |

### Precautions

| 1. Adenosine may provoke bronchospasm in the asthmatic patient |
| 2. Adenosine is antagonised by methylxanthines (e.g. caffeine or theophyllines). The drug may not be effective in patients with large caffeine intake or those on high doses of theophylline medication |

### Route of administration

| IV |
### Side effects
- Usually brief and transitory
- Transient arrhythmia (including asystole, bradycardia or ventricular ectopy) may be experienced following reversion
- Chest pain
- Dyspnoea
- Headache or dizziness
- Nausea
- Skin flushing

### Special notes
Adenosine has a very short half life. It should be administered rapidly through an IV as close to the heart as practicable, such as the cubital fossa.

**Intravenous effects:**
**Duration:** < 10 seconds
## Presentation
1 mg in 1 mL glass ampoule (1:1,000)
1 mg in 10 mL glass ampoule (1:10,000)

## Pharmacology
A naturally occurring alpha and beta-adrenergic stimulant

**Actions:**
- Increases HR by increasing SA node firing rate (Beta 1)
- Increases conduction velocity through the A-V node (Beta 1)
- Increases myocardial contractility (Beta 1)
- Increases the irritability of the ventricles (Beta 1)
- Causes bronchodilatation (Beta 2)
- Causes peripheral vasoconstriction (Alpha)

## Metabolism
By monoamine oxidase and other enzymes in the blood, liver and around nerve endings; excreted by the kidneys

## Primary emergency indications
1. Cardiac arrest - VF/VT, Asystole or PEA
2. Inadequate perfusion (cardiogenic or non-cardiogenic/non-hypovolaemic)
3. Bradycardia with poor perfusion
4. Anaphylaxis
5. Severe asthma - imminent life threat not responding to nebulised therapy, or unconscious with no BP
6. Croup

## Contraindications
1. Hypovolaemic shock without adequate fluid replacement

## Precautions
Consider reduced doses for:
1. Elderly / frail patients
2. Patients with cardiovascular disease
3. Patients on monoamine oxidase inhibitors
4. Higher doses may be required for patients on beta blockers
## Adrenaline

**Route of administration**
- IV
- IM
- Nebulised
- IV infusion
- IO

<table>
<thead>
<tr>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sinus tachycardia</td>
</tr>
<tr>
<td>• Supraventricular arrhythmias</td>
</tr>
<tr>
<td>• Ventricular arrhythmias</td>
</tr>
<tr>
<td>• Hypertension</td>
</tr>
<tr>
<td>• Pupillary dilatation</td>
</tr>
<tr>
<td>• May increase size of MI</td>
</tr>
<tr>
<td>• Feeling of anxiety/palpitations in the conscious patient</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV <strong>Adrenaline</strong> should be reserved for life threatening situations.</td>
</tr>
<tr>
<td><strong>IV effects:</strong></td>
</tr>
<tr>
<td>Onset: 30 seconds</td>
</tr>
<tr>
<td>Peak: 3 – 5 minutes</td>
</tr>
<tr>
<td>Duration: 5 – 10 minutes</td>
</tr>
<tr>
<td><strong>IM effects:</strong></td>
</tr>
<tr>
<td>Onset: 30 – 90 seconds</td>
</tr>
<tr>
<td>Peak: 4 – 10 minutes</td>
</tr>
<tr>
<td>Duration: 5 – 10 minutes</td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td><strong>Pharmacology</strong></td>
</tr>
<tr>
<td><strong>Metabolism</strong></td>
</tr>
</tbody>
</table>
| **Primary emergency Indications** | 1. VF / pulseless VT refractory to cardioversion  
2. Sustained or recurrent VT |
| **Contraindications** | 1. VF / pulseless VT refractory to cardioversion  
   • Nil of significance in above indication  
2. VT  
   • Pregnancy  
3. TCA OD  
4. Do not administer Amiodarone if VT follows Ondansetron administration |
| **Precautions** | 1. Nil of significance in the above indications |
| **Route of administration** | IV |
| **Side effects** | • Hypotension  
• Bradycardia |
| **Special notes** | IV effects (bolus):  
   Onset: 2 minutes  
   Peak: 20 minutes  
   Duration: 2 hours  
   Amiodarone is incompatible with Normal Saline. Glucose 5% must be used as diluent when preparing an IV infusion.  
An IV infusion of Amiodarone may be required during interhospital transfer.  
This will be prescribed by the referring physician and will normally be at a dose of 10 - 20 mg/kg run over 24 hours. |
**Presentation**  
300 mg chewable tablets  
300 mg soluble or water dispersible tablets

**Pharmacology**  
An analgesic, antipyretic, anti-inflammatory and antiplatelet aggregation agent  
**Actions:**  
- To minimise platelet aggregation and thrombus formation in order to retard the progression of coronary artery thrombosis in ACS  
- Inhibits synthesis of prostaglandins - anti-inflammatory actions

**Metabolism**  
Converted to salicylate in the gut mucosa and liver; excreted mainly by the kidneys

**Primary emergency indications**  
1. ACS

**Contraindications**  
1. Hypersensitivity to aspirin / salicylates  
2. Actively bleeding peptic ulcers  
3. Bleeding disorders  
4. Suspected dissecting aortic aneurysm  
5. Chest pain associated with psychostimulant OD if SBP >160 mmHg

**Precautions**  
1. Peptic ulcer  
2. Asthma  
3. Patients on anticoagulants

**Route of administration**  
Oral

**Side effects**  
- Heartburn, nausea, gastrointestinal bleeding  
- Increased bleeding time  
- Hypersensitivity reactions

**Special notes**  
Aspirin is C/I for use in acute febrile illness in children and adolescents  
The anti-platelet effects of Aspirin persist for the natural life of platelets.  
**Onset:** n/a  
**Peak:** n/a  
**Duration:** 8 - 10 days
## Presentation

<table>
<thead>
<tr>
<th>0.6 mg in 1 mL polyamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2 mg in 1 mL polyamp</td>
</tr>
</tbody>
</table>

## Pharmacology

An anticholinergic agent

**Actions:**
- inhibits the actions of acetylcholine on post-ganglionic cholinergic nerves at the neuro-effector site, e.g. as a vagal blocker and allows sympathetic effect to:
  - increase heart rate by increasing SA node firing rate
  - increase the conduction velocity through the A-V node
- antidote to reverse the effects of cholinesterase inhibitors, (e.g. organophosphate insecticides) at the post-ganglionic neuro-effector sites of cholinergic nerves to:
  - reduce the excessive salivary, sweat, GIT and bronchial secretions; and
  - relax smooth muscles

## Metabolism

By the liver; excreted mainly by the kidneys

## Primary emergency Indications

1. Unstable bradycardia
2. Organophosphate poisoning with excessive cholinergic effects
3. Hypersalivation as a side effect of ketamine

## Contraindications

1. Previous heart transplant

## Precautions

1. Atrial flutter
2. AF
3. Myocardial infarction
4. Do not increase HR above 100 bpm except in children under 6 years
5. Glaucoma

## Route of administration

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

### Special notes
**IV effects:**
- **Onset:** < 2 minutes
- **Peak:** < 5 minutes
- **Duration:** 2 - 6 hours

10 mL flush of Normal Saline must be administered after Atropine if Adrenaline is to also be administered.
Mode of action
- Electrolyte – replaces depleted serum calcium.
- Calcium directly antagonises the effects of hyperkalaemia on myocardial cells, but has no effect on potassium levels.
- Hypocalcaemia is associated with blood transfusions due to the addition of citrate to packed red cell concentrate (PRCC). Citrate chelates ionised calcium, reducing plasma concentrations.

Indications
- Cardiac arrest where hyperkalaemia is suspected
- Following transfusion of PRCC (MFP only)

Contraindications
- Suspected digoxin toxicity

Precautions
- Monitor injection site carefully and stop administration immediately if extravasation occurs.

Adverse effects
- Hypercalcaemia
- Tissue necrosis (extravasation)
- Rapid administration may cause:
  - Hot flushes
  - Chalky taste
  - Hypotension
  - Bradycardia
  - Cardiac arrhythmias (AV dissociation, ventricular ectopics, VT and VF)
  - Syncope
  - Cardiac arrest

Significant interactions
- Nil significant

Pregnancy
- Considered safe to use

Breastfeeding
- Considered safe to use

Administration Advice
- Calcium gluconate may precipitate. Do not use if the solution is cloudy or contains particles
- Do not administer via IM or SC injection due to risk of tissue necrosis
- Presentation: 953 mg (considered equivalent to 1 gram / 2.2 mmol) calcium in 10 mL glass vial.
- Route: Slow IV injection into a large peripheral vein. Administer over 2 – 5 minutes to reduce adverse effects. May be given faster in cardiac arrest.
- Onset of action: < 3 minutes
• **Duration of action:** 30 – 60 min

**Notes**

- **Do not confuse or use interchangeably with calcium chloride.** Calcium chloride is associated with a high risk if extravasation occurs and contains three times as much calcium per mL as calcium gluconate.

**Infusion**

- None
# Ceftriaxone

<table>
<thead>
<tr>
<th>Presentation</th>
<th>1 g sterile powder in a glass vial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology</td>
<td>Cephalosporin antibiotic</td>
</tr>
<tr>
<td>Metabolism</td>
<td>Excreted unchanged in urine (33% - 67%) and in bile</td>
</tr>
</tbody>
</table>
| **Primary emergency Indications** | 1. Suspected meningococcal septicaemia  
2. Severe sepsis (consult only) |
| Contraindications | 1. Allergy to Cephalosporin antibiotics |
| Precautions  | 1. Allergy to Penicillin antibiotics |
| Route of administration | IV (preferred)  
IM (if IV access unavailable) |
| Side effects | • Nausea  
• Vomiting  
• Skin rash |
| Special notes | **Usual dose:** adult 1 g, child 50 mg/kg (max. 1 g)  
*Ceftriaxone* IV must be made up to 10 mL using sterile water and dose administered over 2 minutes  
*Ceftriaxone* IM must be made up to 4 mL using 1% *Lignocaine* and dose administered in lateral upper thigh  
**IM/IV effects:**  
Onset: n/a  
Peak: n/a  
Duration: n/a |
**Presentation**

| 8 mg in 2 mL glass vial |

**Pharmacology**

A corticosteroid secreted by the adrenal cortex

- Relieves inflammatory reactions
- Provides immunosuppression

**Metabolism**

By the liver and other tissues; excreted predominantly by the kidneys

**Primary emergency indications**

1. Bronchospasm associated with acute respiratory distress not responsive to nebulised Salbutamol
2. Moderate - severe croup
3. Acute exacerbation of COPD
4. Adult stridor (non-foreign body obstruction)

**Contraindications**

1. Known hypersensitivity

**Precautions**

1. Solutions which are not clear or are contaminated should be discarded

**Route of administration**

IV (administered over 1 - 3 minutes), Oral

**Side effects**

- Nil of significance in the above indication

**Special notes**

Does not contain an antimicrobial agent, therefore use solution immediately and discard any residue

- **IV effects:**
  - Onset: 30 - 60 minutes
  - Peak: 2 hours
  - Duration: 36 - 72 hours
**Presentation** 100 mL infusion soft pack

| Pharmacology | An isotonic crystalloid solution  
|             | Composition:  
|             | • Sugar – 5% dextrose  
|             | • Water  
|             | Actions:  
|             | • Provides a small source of energy  
|             | • Supplies body water  

| Metabolism | • Dextrose:  
|           | — Broken down in most tissues  
|           | — Stored in the liver and muscle as glycogen  
|           | • Water:  
|           | — Excreted by the kidneys  
|           | — Distributed throughout total body water, mainly in the extracellular fluid compartment  

| Primary emergency indications | 1. Vehicle for dilution and administration of IV emergency drugs  
|------------------------------|-------------------------------------------------  
| Contraindications | 1. Nil of significance in the above indication  
| Precautions | 1. Nil of significance in the above indication  

| Route of administration | IV infusion  
|-------------------------|-----------------  
| Side effects | • Nil of significance in the above indication  

| Special notes | IV half life: Approximately 20 - 40 minutes  

---

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
### Pharmacology

**Composition:**
- Sugar – 10% dextrose
- Water

**Actions:**
- Provides a source of energy
- Supplies body water

### Metabolism

**Dextrose:**
- Broken down in most tissues
- Stored in the liver and muscle as glycogen

**Water:**
- Excreted by the kidneys
- Distributed throughout total body water, mainly in the extracellular fluid compartment

### Primary emergency indications

1. Diabetic hypoglycaemia (BGL analysis < 4 mmol/L) in patients with an altered conscious state who are unable to self-administer oral glucose

### Contraindications

1. Nil of significance in the above indication

### Precautions

1. Nil of significance in the above indication

### Route of administration

- IV infusion

### Side effects

- Nil of significance in the above indication

### Special notes

**IV effects:**
- **Onset:** 3 minutes
- **Peak:** n/a
- **Duration:** Depends on severity of hypoglycaemic episode
### Presentation

<table>
<thead>
<tr>
<th>100 mcg in 2 mL glass ampoule</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 mcg in 1 mL glass ampoule or cartridge (IN use only)</td>
</tr>
</tbody>
</table>

### Pharmacology

A synthetic opioid analgesic

**Actions:**

**CNS effects:**
- Depression – leading to analgesia
- Respiratory depression – leading to apnoea
- Dependence (addiction)

**Cardiovascular effects:**
- Decreases conduction velocity through the A-V node

### Metabolism

By the liver; excreted by the kidneys

### Primary emergency Indications

1. Sedation to facilitate intubation (*RSI* - modified or *Paediatric IFS*)
2. Sedation to maintain intubation
3. Sedation to facilitate transthoracic pacing
4. Sedation to facilitate synchronised cardioversion
5. CPR interfering patient - ALS
6. Analgesia – IV/IN
   - History of hypersensitivity or allergy to morphine
   - Known renal impairment / failure
   - Short duration of action desirable
   - Hypotension
   - Nausea and/or vomiting
   - Severe headache

### Contraindications

1. History of hypersensitivity
2. Late second stage of labour

### Precautions

1. Elderly/frail patients
2. Impaired hepatic function
3. Respiratory depression, e.g. COPD
4. Current asthma
5. Patients on monoamine oxidase inhibitors
6. Known addiction to opioids
7. Rhinitis, rhinorrhea or facial trauma (IN route)
**Route of administration**
- IV
- IN
- IV infusion

**Side effects**
- Respiratory depression
- Apnoea
- Rigidity of the diaphragm and intercostal muscles
- Bradycardia

**Special notes**
Fentanyl is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility.
Respiratory depression can be reversed with Naloxone.
100 mcg Fentanyl is equivalent in analgesic activity to 10 mg Morphine.

**IV effects:**
- **Onset:** Immediate
- **Peak:** < 5 minutes
- **Duration:** 30 - 60 minutes

**IN effects:**
- **Peak:** 2 minutes
<table>
<thead>
<tr>
<th><strong>Presentation</strong></th>
<th>40 mg in 4 mL glass ampoule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pharmacology</strong></td>
<td>A diuretic</td>
</tr>
<tr>
<td></td>
<td><strong>Actions:</strong></td>
</tr>
<tr>
<td></td>
<td>• Causes venous dilatation and reduces venous return</td>
</tr>
<tr>
<td></td>
<td>• Promotes diuresis</td>
</tr>
<tr>
<td><strong>Metabolism</strong></td>
<td>Excreted by the kidneys</td>
</tr>
<tr>
<td><strong>Primary emergency Indications</strong></td>
<td>1. Consider in cardiogenic acute pulmonary oedema</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>1. Nil of significance in the above indication</td>
</tr>
<tr>
<td><strong>Precautions</strong></td>
<td>1. Hypotension</td>
</tr>
<tr>
<td><strong>Route of administration</strong></td>
<td>IV</td>
</tr>
<tr>
<td><strong>Side effects</strong></td>
<td>• Hypotension</td>
</tr>
<tr>
<td><strong>Special notes</strong></td>
<td>The effect of vasopressor drugs will often be reduced after treatment with Furosemide. IV effects: Onset: 5 minutes Peak: 20 - 60 minutes Duration: 2 - 3 hours</td>
</tr>
</tbody>
</table>
**Presentation**  | 1 mg (IU) in 1 mL hypokit
---|---
**Pharmacology** | A hormone normally secreted by the pancreas  
- Causes an increase in blood glucose concentration by converting stored liver glycogen to glucose
**Metabolism** | Mainly by the liver, also by the kidneys and in the plasma
**Primary emergency indications** | 1. Diabetic hypoglycaemia (BGL < 4 mmol/L) in patients with an altered conscious state who are unable to self-administer oral glucose
**Contraindications** | 1. Nil of significance in the above indication
**Precautions** | 1. Nil of significance in the above indication
**Route of administration** | IM
**Side effects** | • Nausea and vomiting (rare)
**Special notes** | Not all patients will respond to Glucagon, e.g. those with inadequate glycogen stores in the liver (alcoholics, malnourished).
**IM effects:**  
- **Onset:** 5 minutes  
- **Peak:** n/a  
- **Duration:** 25 minutes
| Presentation | 0.3 mg tablet  
 0.6 mg tablets  
 Transdermal GTN Patch (50 mg 0.4 mg/hr release) |
|--------------|--------------------------------------------------|
| Pharmacology | Principally, a vascular smooth muscle relaxant  
 Actions:  
 • Venous dilatation promotes venous pooling and reduces venous return to the heart (reduces preload)  
 • Arterial dilatation reduces systemic vascular resistance and arterial pressure (reduces afterload)  
 The effects of the above are:  
 • Reduced myocardial $O_2$ demand  
 • Reduced systolic, diastolic and mean arterial blood pressure, whilst usually maintaining coronary perfusion pressure  
 • Mild collateral coronary arterial dilatation may improve blood supply to ischaemic areas of myocardium  
 • Mild tachycardia secondary to slight fall in blood pressure  
 • Preterm labour: Uterine quiescence in pregnancy |
| Metabolism    | By the liver                                      |
| Primary emergency Indications | 1. Chest pain with ACS  
 2. Acute LVF  
 3. Hypertension associated with ACS  
 4. Autonomic dysreflexia  
 5. Preterm labour (consult) |
### Contraindications
1. Known hypersensitivity
2. Systolic blood pressure < 110 mmHg tablet
3. Systolic blood pressure < 90 mmHg patch
4. Sildenafil Citrate (Viagra) or Vardenafil (Levitra) administration in the previous 24 hr or Tadalafil (Cialis) administration in the previous 4 days (PDE5 inhibitors)
5. Heart rate > 150 bpm
6. Bradycardia HR < 50 bpm (excluding autonomic dysreflexia)
7. VT
8. Inferior STEMI with systolic BP < 160 mmHg
9. Right ventricular MI

### Precautions
1. No previous administration
2. Elderly patients
3. Recent MI
4. Concurrent use with other tocolytics

### Route of administration
- SL
- Buccal
- Transdermal
- Infusion (interhospital transfer only)

### Side effects
- Tachycardia
- Hypotension
- Headache
- Skin flushing (uncommon)
- Bradycardia (occasionally)
Special notes

<table>
<thead>
<tr>
<th>Storage:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTN is susceptible to heat and moisture. Make sure that tablets are stored in their original light resistant, tightly sealed bottles. The foil pack of the patches should be intact.</td>
</tr>
<tr>
<td>Do not administer patient’s own tablets, as its storage may not have been in optimum conditions or it may have expired.</td>
</tr>
<tr>
<td>Patches should be discarded prior to use-by date.</td>
</tr>
<tr>
<td>Since both men and women can be prescribed PDE5 inhibitors all patients should be asked if and when they last had the medication to determine if GTN is C/I.</td>
</tr>
<tr>
<td>Tadalafil (Cialis) may also be prescribed to men for treatment of benign prostatic hypertrophy. This is a new indication for the medication and may lead to an increased number of patients under this treatment regimen.</td>
</tr>
<tr>
<td>GTN by IV infusion may be required for an interhospital transfer as per the treating doctor’s orders.</td>
</tr>
</tbody>
</table>

**Interhospital transfer:**
The IV dose is to be prescribed and signed by the referring hospital medical officer. Infusions usually run in the range of 5 mcg/minute to 200 mcg/minute and increased 3 - 5 mcg/minute.

**S/L effects:**

- **Onset:** 30 seconds – 2 minutes
- **Peak:** 5 - 10 minutes
- **Duration:** 15 - 30 minutes

**Intravenous effects**

- **Onset:** 30 seconds – 1 minute
- **Peak:** 3 - 5 minutes
- **Duration:** 15 - 30 minutes

**Transdermal effect**

- **Onset:** Up to 30 minutes
- **Peak:** 2 hours
**Presentation**  
5000 units in 5 mL plastic ampoule

**Pharmacology**  
Anticoagulant  
Inactivates clotting factors IIa (thrombin) and Xa by binding to antithrombin III

**Metabolism**  
Metabolised by the liver; excreted by the kidneys

**Primary emergency indications**  
1. Acute STEMI

**Contraindications**  
1. Known allergy or hypersensitivity  
2. Active bleeding (excluding menses)  
3. Oral anticoagulants  
4. Bleeding disorders  
5. History of Heparin-Induced Thrombocytopenia (HIT)  
6. Severe hepatic impairment / disease, including oesophageal varices  
7. Recent trauma or surgery (< 3 weeks)

**Precautions**  
1. Renal impairment

**Route of administration**  
IV

**Side effects**  
- Bleeding  
- Bruising and pain at injection site  
- Hyperkalaemia  
- Thrombocytopenia (mild to severe)

**Special notes**  
Do not inject IM due to risk of causing haematoma  
Onset: immediate  
Duration: 3-6 hours.  
The plasma half-life of Heparin is 60 minutes. As such, any patient receiving Heparin as a bolus dose will also require repeat doses if their travel time to PCI is > 1 hour.
## Ipratropium Bromide

### Presentation

250 mcg in 1 mL nebulor or polyamp

### Pharmacology

Anticholinergic bronchodilator

**Actions:**
- Allows bronchodilatation by inhibiting cholinergic bronchomotor tone (i.e. blocks vagal reflexes which mediate bronchoconstriction)

### Metabolism

Excreted by the kidneys

### Primary emergency indications

1. **Severe respiratory distress associated with bronchospasm**
2. **Exacerbation of COPD irrespective of severity**

### Contraindications

1. **Known hypersensitivity to Atropine or its derivatives**

### Precautions

1. **Glaucoma**
2. **Avoid contact with eyes**

### Route of administration

Nebulised (in combination with Salbutamol)

### Side effects

- Headache
- Nausea
- Dry mouth
- Skin rash
- Tachycardia (rare)
- Palpitations (rare)
- Acute angle closure glaucoma secondary to direct eye contact (rare)

### Special notes

There have been isolated reports of ocular complications (dilated pupils, increased intraocular pressure, acute angle glaucoma, eye pain) as a result of direct eye contact with **Ipratropium Bromide** formulations.

The nebuliser mask must therefore be fitted properly during inhalation and care taken to avoid **Ipratropium Bromide** solution entering the eyes.

**Ipratropium Bromide** must be nebulised in conjunction with **Salbutamol** and is to be administered as a single dose only.

- **Onset:** 3 - 5 minutes
- **Peak:** 1.5 - 2 hours
- **Duration:** 6 hours
Mode of action
Anaesthetic agent with analgesic properties at lower doses.

Exact mechanism of action is unclear, but primarily works as an antagonist at N-methyl-D-aspartate (NMDA) receptors. Ketamine may also interact with opioid, muscarinic and other receptors. Produces a trance-like dissociative state with amnesia, with preservation of laryngeal and pharyngeal reflexes.

Indications
- Intubation
- Analgesia, as an adjunct to opioids in extreme traumatic pain
- Sedation:
  - Agitation
  - Patient movement during CPR

Contraindications
- Suspected non-traumatic brain injury with severe hypertension (SBP > 180)

Precautions
- May exacerbate cardiovascular conditions (e.g. uncontrolled hypertension, stroke, recent MI, cardiac failure) due to effects on HR and BP.

Adverse effects
- CV: hypertension, tachycardia
- CNS: emergence reactions (e.g. vivid dreams, restlessness, confusion, hallucinations, irrational behavior); increased skeletal muscle tone (may resemble seizures)
- Respiratory: transient respiratory depression and apnoea (rare)
- GI: nausea and vomiting
- Other: injection site pain, lacrimation, hypersalivation, diplopia, nystagmus

Significant interactions
- Nil

Pregnancy
- Considered safe to use¹

Breastfeeding
- Monitoring required - observe the infant for potential adverse effects (drowsiness, poor feeding, sleeping pattern changes)¹
  (*NB. Unlikely scenario in context of emergency indications)

Details
- Presentation: 200 mg / 2 mL glass ampoule
- Route:
  - IV (dilute ketamine 200 mg / 2 mL to 20 mL with 18 mL of Normal Saline (10 mg/mL).
  - Administer IV doses slowly (over at least 1 minute); rapid administration may result in respiratory depression and enhanced hypertensive response
  - IM (do not dilute)
Onset of action:
- IV 30 seconds (anaesthesia)
- IM 3 – 4 minutes

Peak: N/A

Duration of action:
- IV 5 – 10 minutes (anaesthesia)
- IM 12 – 25 minutes

Notes
- Ketamine is managed as a restricted medication in AV
- Emergence reactions associated with ketamine administration for analgesia in adult patients may be managed with midazolam. Consultation with the RCH is required to administer midazolam to paediatric patients

Infusion
- AAV only: Ketamine 50mg added to make 50 mL with Dextrose 5% or Normal Saline to make 1 mg/mL dilution

References
Mode of action
Sodium channel blocker – interrupts impulse conduction in peripheral nerves and stabilises excitable cell membranes

Indications
- Local anaesthetic to reduce pain associated with:
  - Intramuscular administration of ceftriaxone
  - Chest decompression in patients with GCS > 10 (MICA only)
  - Intraosseous administration of medication or fluid in a conscious patient (MICA only)

Contraindications
- Known hypersensitivity to lidocaine or related local anaesthetics (bupivacaine, levobupivacaine, prilocaine, ropivacaine)

Precautions
- IM and local infiltration – inadvertent intravascular administration may result in systemic toxicity (see below)
- IO – impaired CV function (e.g. hypotension, bradycardia, poor perfusion, heart block, heart failure)

Adverse effects
- Allergic reactions are rare and may present as localised oedema, urticaria, bronchospasm and anaphylaxis
- Signs of systemic toxicity include:
  - CNS: tinnitus, blurred vision, sudden change in conscious state, agitation, convulsions,
  - CV: hypotension, bradycardia, arrhythmias (e.g. conduction blocks, ventricular tachyarrhythmias), cardiac arrest

Significant interactions
- Nil

Pregnancy
- Safe to use

Breastfeeding
- Safe to use

Details
- **Presentation:** 50 mg in 5 mL amp (1% solution)
- **Route:** IM (when used to reconstitute ceftriaxone only)
  Local tissue infiltration (for chest decompression)
  IO - infuse slowly over 120 seconds and allow to dwell for 60 seconds. Flush IO catheter with normal saline (5-10mL for adults, 2-5 mL for paediatrics)
- **Onset of action:** 1-5 minutes (infiltration); 5-15 minutes (other routes)
- **Duration of action:** 1-1.5 hours

Notes
- Lidocaine and lignocaine are the same medication, but lidocaine is the preferred name internationally. Both names will be in use in Australia until 2023.
Infusion
  • None
### Pharmacology
- A local anaesthetic agent
  - Actions:
    - Prevents initiation and transmission of nerve impulses (local anaesthesia)

### Metabolism
- By the liver (90%)
- Excreted unchanged by the kidneys (10%)

### Primary emergency Indications
1. To reduce the pain of IO drug and fluid administration in the responsive patient

### Contraindications
1. Known hypersensitivity

### Precautions
1. Hypotension and poor perfusion
2. Chronic LVF
3. Liver disease

### Route of administration
- IO

### Side effects
- CNS effects (common):
  - drowsiness
  - disorientation
  - decreased hearing
  - blurred vision
  - change or slurring of speech
  - twitching and agitation
  - convulsions
- Cardiovascular effects (uncommon):
  - hypotension
  - bradycardia
  - sinus arrest
  - A-V block
- Respiratory effects (uncommon):
  - difficulty in breathing
  - respiratory arrest
<table>
<thead>
<tr>
<th>Special notes</th>
<th>IO effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Onset:</strong> 1 – 4 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Peak:</strong> 5 – 10 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Duration:</strong> 20 minutes</td>
</tr>
</tbody>
</table>

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Mode of action
Sodium channel blocker – interrupts impulse conduction in peripheral nerves and stabilises excitable cell membranes

Indications
- **Investigational agent – for patients enrolled in the AVOID-2 clinical trial only**
  - Pain associated with suspected ST-elevation myocardial infarction

Contraindications
- AVOID-2 exclusion criteria:
  - Known hypersensitivity to lidocaine
  - Bradycardia (HR < 50)
  - Cardiac arrest or cardiogenic shock (SBP < 90mmHg)
  - Past history of epilepsy, renal failure or liver failure

Precautions
- Nil

Adverse effects
- Allergic reactions are rare and may present as localised oedema, urticaria, bronchospasm and anaphylaxis
- Signs of systemic toxicity include:
  - CNS: tinnitus, blurred vision, sudden change in conscious state, agitation, convulsions,
  - CV: hypotension, bradycardia, arrhythmias (e.g. conduction blocks, ventricular tachyarrhythmias), cardiac arrest

Significant interactions
- Nil

Pregnancy
- Safe to use

Breastfeeding
- Safe to use

Details
- **Presentation:** 50 mg in 5 mL amp (1%)
- **Route:** IV – administer each dose over 1-2 minutes
- **Onset of action:** 5-15 minutes
- **Duration of action:** 1-1.5 hours

Notes
- Lidocaine and lignocaine are the same medication, but lidocaine is the preferred name internationally. Both names will be in use in Australia until 2023.
<table>
<thead>
<tr>
<th>Presentation</th>
<th>3 mL glass bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pharmacology</strong></td>
<td>Inhalational analgesic agent at low concentrations</td>
</tr>
<tr>
<td><strong>Metabolism</strong></td>
<td>Excreted mainly by the lungs</td>
</tr>
<tr>
<td></td>
<td>By the liver</td>
</tr>
<tr>
<td><strong>Primary emergency indications</strong></td>
<td>1. Pain relief</td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
<td>1. Pre-existing renal disease / renal impairment</td>
</tr>
<tr>
<td></td>
<td>2. Concurrent use of tetracycline antibiotics</td>
</tr>
<tr>
<td></td>
<td>3. Exceeding total dose of 6 mL in a 24 hour period</td>
</tr>
<tr>
<td></td>
<td>4. Personal or family history of malignant hyperthermia</td>
</tr>
<tr>
<td></td>
<td>5. Muscular dystrophy</td>
</tr>
<tr>
<td><strong>Precautions</strong></td>
<td>1. The Penthrox™ inhaler must be hand-held by the patients so that if unconsciousness occurs it will fall from the patient’s face. Occasionally the operator may need to assist but must continuously assess the level of consciousness</td>
</tr>
<tr>
<td></td>
<td>2. Pre-eclampsia</td>
</tr>
<tr>
<td></td>
<td>3. Concurrent use with Oxytocin may cause hypotension</td>
</tr>
<tr>
<td><strong>Route of administration</strong></td>
<td>Self-administration under supervision using the hand held Penthrox™ Inhaler</td>
</tr>
<tr>
<td><strong>Side effects</strong></td>
<td>• Drowsiness</td>
</tr>
<tr>
<td></td>
<td>• Decrease in blood pressure and bradycardia (rare)</td>
</tr>
<tr>
<td></td>
<td>• Exceeding the maximum total dose of 6 mL in a 24 hour period may lead to renal toxicity</td>
</tr>
</tbody>
</table>
### Special notes

The maximum initial priming dose for **Methoxyflurane** is 3 mL. This will provide approximately 25 minutes of analgesia and may be followed by one further 3 mL dose once the initial dose is exhausted if required. Analgesia commences after 8 - 10 breaths and lasts for approximately 3 - 5 minutes once discontinued.

Do not administer in a confined space. Ensure adequate ventilation in ambulance.

Malignant hyperthermia is a very rare condition that can be induced by volatile anaesthetics such as methoxyflurane. Ask patients about any past history or family history of adverse reactions to inhaled anaesthetics.

In patients with muscular dystrophy, volatile agents may precipitate lifethreatening rhabdomyolysis.
## Midazolam

### Presentation
- 5 mg in 1 mL glass ampoule
- 15 mg in 3 mL glass ampoule

### Pharmacology
- Short acting CNS depressant
- **Actions:**
  - Anxiolytic
  - Sedative
  - Anti-convulsant

### Metabolism
- In the liver; excreted by the kidneys

### Primary emergency indications
1. Status epilepticus
2. Sedation to maintain intubation
3. Sedation to facilitate intubation *(RSI - modified or Paediatric IFS)*
4. Sedation to facilitate synchronised cardioversion
5. Sedation to facilitate transthoracic pacing
6. Sedation in the agitated patient (including patients under the Mental Health Act 2014)
7. Sedation in psychostimulant OD

### Contraindications
1. Known hypersensitivity to benzodiazepines

### Precautions
1. Reduced doses may be required for the elderly/frail, patients with chronic renal failure, CCF or shock
2. The CNS depressant effects of benzodiazepines are enhanced in the presence of narcotics and other tranquillisers including alcohol
3. Can cause severe respiratory depression in patients with COPD
4. Patients with myasthenia gravis

### Route of administration
- IM
- IV
- IV infusion

### Side effects
- Depressed level of consciousness
- Respiratory depression
- Loss of airway control
- Hypotension
### Special notes

<table>
<thead>
<tr>
<th>IM effects</th>
<th>IV effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onset:</strong> 3 – 5 minutes</td>
<td><strong>Onset:</strong> 1 – 3 minutes</td>
</tr>
<tr>
<td><strong>Peak:</strong> 15 minutes</td>
<td><strong>Peak:</strong> 10 minutes</td>
</tr>
<tr>
<td><strong>Duration:</strong> 30 minutes</td>
<td><strong>Duration:</strong> 20 minutes</td>
</tr>
</tbody>
</table>
**Presentation**

| Presentation | 10 mg in 1 mL glass ampoule |

**Pharmacology**

<table>
<thead>
<tr>
<th>Actions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CNS effects:</strong></td>
<td></td>
</tr>
<tr>
<td>Depression (leading to analgesia)</td>
<td></td>
</tr>
<tr>
<td>Respiratory depression</td>
<td></td>
</tr>
<tr>
<td>Depression of cough reflex</td>
<td></td>
</tr>
<tr>
<td>Stimulation (changes of mood, euphoria or dysphoria, vomiting, pinpoint pupils)</td>
<td></td>
</tr>
<tr>
<td>Dependence (addiction)</td>
<td></td>
</tr>
<tr>
<td><strong>Cardiovascular effects:</strong></td>
<td></td>
</tr>
<tr>
<td>Vasodilatation</td>
<td></td>
</tr>
<tr>
<td>Decreases conduction velocity through the A-V Node</td>
<td></td>
</tr>
</tbody>
</table>

**Metabolism**

| Metabolism | By the liver; excreted by the kidneys |

**Primary emergency Indications**

| 1. Pain relief |  |
| 2. Sedation to maintain intubation |  |
| 3. Sedation facilitate intubation (where fentanyl not appropriate for RSI - modified or Paediatric IFS) |  |

**Contraindications**

| 1. History of hypersensitivity |  |
| 2. Renal impairment / failure |  |
| 3. Late second stage of labour |  |

**Precautions**

| 1. Elderly/frail patients |  |
| 2. Hypotension |  |
| 3. Respiratory depression |  |
| 4. Current asthma |  |
| 5. Respiratory tract burns |  |
| 6. Known addiction to opioids |  |
| 7. Acute alcoholism |  |
| 8. Patients on monoamine oxidase inhibitors |  |

**Route of administration**

<p>| Route of administration | IV / IM / Subcutaneous |</p>
<table>
<thead>
<tr>
<th>Side effects</th>
<th>Special notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CNS effects:</td>
<td></td>
</tr>
<tr>
<td>— Drowsiness</td>
<td></td>
</tr>
<tr>
<td>— Respiratory depression</td>
<td></td>
</tr>
<tr>
<td>— Euphoria</td>
<td></td>
</tr>
<tr>
<td>— Nausea, vomiting</td>
<td></td>
</tr>
<tr>
<td>— Addiction</td>
<td></td>
</tr>
<tr>
<td>— Pin-point pupils</td>
<td></td>
</tr>
<tr>
<td>• Cardiovascular effects:</td>
<td></td>
</tr>
<tr>
<td>— Hypotension</td>
<td></td>
</tr>
<tr>
<td>— Bradycardia</td>
<td></td>
</tr>
</tbody>
</table>

**Morphine** is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility.

Side effects of **Morphine** can be reversed with **Naloxone**.

Occasional wheals are seen in the line of the vein being used for IV injection. This is not an allergy, only a histamine release.

**IV effects:**

- **Onset:** 2 – 5 minutes
- **Peak:** 10 minutes
- **Duration:** 1 – 2 hours

**IM effects:**

- **Onset:** 10 – 30 minutes
- **Peak:** 30 – 60 minutes
- **Duration:** 1 – 2 hours
<table>
<thead>
<tr>
<th>Presentation</th>
<th>0.4 mg in 1 mL glass ampoule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology</td>
<td>An opioid antagonist</td>
</tr>
<tr>
<td></td>
<td>Actions:</td>
</tr>
<tr>
<td></td>
<td>• Prevents or reverses the effects of opioids</td>
</tr>
<tr>
<td>Metabolism</td>
<td>By the liver</td>
</tr>
<tr>
<td>Primary emergency indications</td>
<td>1. Altered conscious state and respiratory depression secondary to administration of opioids or related drugs</td>
</tr>
<tr>
<td>Contraindications</td>
<td>1. Nil of significance in the above indication</td>
</tr>
<tr>
<td>Precautions</td>
<td>1. If patient is known to be physically dependent on opioids, be prepared for a combative patient after administration</td>
</tr>
<tr>
<td></td>
<td>2. Neonates</td>
</tr>
<tr>
<td>Route of administration</td>
<td>IM</td>
</tr>
<tr>
<td>Side effects</td>
<td>Symptoms of opioid withdrawal:</td>
</tr>
<tr>
<td></td>
<td>• Sweating, goose flesh, tremor</td>
</tr>
<tr>
<td></td>
<td>• Nausea and vomiting</td>
</tr>
<tr>
<td></td>
<td>• Agitation</td>
</tr>
<tr>
<td></td>
<td>• Dilatation of pupils, excessive lacrimation</td>
</tr>
<tr>
<td></td>
<td>• Convulsions</td>
</tr>
</tbody>
</table>
### Special notes

The duration of action of **Naloxone** is often less than that of the opioid used, therefore repeated doses may be required.

**Naloxone** reverses the effects of opioids with none of the actions produced by other opioid antagonists when no opioid is present in the body. (For example, it does not depress respiration or cause pupillary constriction). In the absence of opioids, **Naloxone** has no perceivable effects.

Following an opioid associated cardiac arrest **Naloxone** should not be administered. Maintain assisted ventilation.

Following head injury **Naloxone** should not be administered. Maintain assisted ventilation if required.

**IV effects:**
- **Onset:** 1 – 3 minutes
- **Peak:** n/a
- **Duration:** 30 – 45 minutes

**IM effects:**
- **Onset:** 1 – 3 minutes
- **Peak:** n/a
- **Duration:** 30 – 45 minutes
| Presentation | 10 mL polyamp  
500 mL and 1000 mL infusion soft pack |
|--------------|------------------------------------------------------|
| Pharmacology | An isotonic crystalloid solution  
Composition:  
• Electrolytes (sodium and chloride in a similar concentration to that of extracellular fluid)  
Action:  
• Increases the volume of the intravascular compartment |
| Metabolism | Electrolytes:  
• Excreted by the kidneys  
Water:  
• Excreted by the kidneys  
• Distributed throughout total body water, mainly in the extracellular fluid compartment |
| Primary emergency indications | 1. As a replacement fluid in volume-depleted patients  
2. Cardiac arrest secondary to hypovolaemia or where the patient may be fluid responsive  
3. To expand intravascular volume in the non-cardiac, non-hypovolaemic hypotensive patient e.g. anaphylaxis, burns, sepsis  
4. As a fluid challenge in unresponsive, non-hypovolaemic, hypotensive patients (other than LVF). e.g. asthma  
5. Fluid for diluting and administering IV drugs  
6. Fluid TKVO for IV administration of emergency drugs |
| Contraindications | 1. Nil of significance in the above indication |
| Precautions | 1. Consider modifying factors when administering for hypovolaemia |
| Route of administration | IV  
IO |
<p>| Side effects | Nil of significance in the above indication |</p>
<table>
<thead>
<tr>
<th>Special notes</th>
<th>IV half life:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Approximately 30 – 60 minutes</td>
</tr>
</tbody>
</table>
5 mg ODT

<table>
<thead>
<tr>
<th>Mode of action</th>
<th>Atypical antipsychotic – antagonist at multiple receptor sites, particularly serotonin (5-HT), dopamine, and histamine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary emergency indications</td>
<td>1. Mild agitation</td>
</tr>
<tr>
<td>Contraindications</td>
<td>1. Nil</td>
</tr>
</tbody>
</table>
| Precautions                                | 1. Olanzapine may be less effective if patient agitation is due to drug intoxication (especially stimulants) or alcohol withdrawal. Benzodiazepines are considered first-line agents in these patients.\(^2\)  
2. Elderly / frail patients and children are more susceptible to adverse effects.\(^1\). |
| Significant interactions                   | 1. Sedative medications / alcohol – over sedation due to synergistic effects.\(^1\). Avoid combination where possible |
| Adverse effects                             | CNS: Sedation, dizziness.\(^1,3\)  
Other: Extrapyramidal symptoms and QT prolongation are unlikely when administered at the approved doses.\(^1,3\) |
| Administration advice                      | Route of administration: Oral – ODT is dissolved in the mouth and then swallowed  
Onset of action: 15 mins\(^4\)  
Duration of action: 12 – 24 hours\(^5\) |
| Pregnancy & breastfeeding category         | Pregnancy: Limited evidence. Administer only if benefit outweighs risk.\(^6\)  
Breastfeeding: Considered safe to use.\(^6\) |
| AV Special notes                           | Administration to patients < 16 years of age can only occur after consultation with the receiving hospital.  
The patient should self-administer the dose under paramedic supervision.  
Olanzapine is managed as a restricted medication in AV.  
Olanzapine and Ondansetron ODTs are similar in name and presentation. Extra care must be taken to ensure the right medication is selected prior to administration |
| Infusion information                       | N/A                                                                                                               |

### References


6. Royal Women’s Hospital Pregnancy and Breastfeeding Medicines Guide. Online via Clinicians Health Channel
| Presentation       | 4 mg orally dissolving tablet  
|                   | 8 mg in 4 mL glass ampoule  |
| Pharmacology      | Anti-emetic  
|                   | Actions:  
|                   | • 5HT₃ antagonist which blocks receptors both centrally and peripherally  |
| Metabolism        | By the liver  |
| Primary emergency |                          |
| Indications       | 1. Undifferentiated nausea and vomiting  
|                   | 2. Prophylaxis for spinally immobilised or eye injured patients  
|                   | 3. Vestibular nausea in patients < 21 years of age  |
| Contraindications | 1. Known hypersensitivity  
|                   | 2. Concurrent Apomorphine use  
|                   | 3. Known Long Q-T syndrome  
|                   | 4. Hypokalaemia or hypomagnesaemia  |
| Precautions       | 1. Patients with liver disease should not receive more than 8 mg of Ondansetron per day  
|                   | 2. Care should be taken with patients on diuretics who may have an underlying electrolyte imbalance  
|                   | 3. Ondansetron contains aspartame and should not be given to patients with phenylketonuria  
|                   | 4. Concurrent use of Tramadol  
|                   | 5. Pregnancy  |
| Route of administration | Oral (ODT), IV, IM  |
### Ondansetron Side effects

<table>
<thead>
<tr>
<th>Side effects</th>
<th>Rare (&lt; 0.1%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypersensitivity reactions (including anaphylaxis)</td>
</tr>
<tr>
<td></td>
<td>Q-T prolongation</td>
</tr>
<tr>
<td></td>
<td>Widened QRS complex</td>
</tr>
<tr>
<td></td>
<td>Tachyarrhythmias (including AF and SVT)</td>
</tr>
<tr>
<td></td>
<td>Seizures</td>
</tr>
<tr>
<td></td>
<td>Extrapyramidal reaction</td>
</tr>
<tr>
<td></td>
<td>Visual disturbances (including transient loss of vision)</td>
</tr>
<tr>
<td>Common (&gt; 1%)</td>
<td>Constipation</td>
</tr>
<tr>
<td></td>
<td>Headache</td>
</tr>
<tr>
<td></td>
<td>Fever</td>
</tr>
<tr>
<td></td>
<td>Dizziness</td>
</tr>
<tr>
<td></td>
<td>Rise in liver enzymes</td>
</tr>
</tbody>
</table>

### Special notes

<table>
<thead>
<tr>
<th>Special notes</th>
<th>ODT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset:</td>
<td>2 minutes</td>
</tr>
<tr>
<td>Peak:</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Duration:</td>
<td>120 minutes</td>
</tr>
<tr>
<td>IV</td>
<td>Onset: 5 minutes</td>
</tr>
<tr>
<td>Peak:</td>
<td>10 minutes</td>
</tr>
<tr>
<td>Duration:</td>
<td>between 2.5 and 6.1 hours</td>
</tr>
</tbody>
</table>

IV doses should be delivered as a slow push (minimum 30 seconds).
<table>
<thead>
<tr>
<th>Presentation</th>
<th>10 units (IU) in 1 mL glass ampoule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology</td>
<td>A synthetic oxytocic</td>
</tr>
<tr>
<td></td>
<td>Actions:</td>
</tr>
<tr>
<td></td>
<td>• Stimulates smooth muscle of the uterus producing contractions</td>
</tr>
<tr>
<td>Metabolism</td>
<td>By the liver; excreted by the kidneys</td>
</tr>
<tr>
<td>Primary emergency indications</td>
<td>1. Primary Postpartum Haemorrhage (PPH)</td>
</tr>
<tr>
<td>Contraindications</td>
<td>1. Previous hypersensitivity</td>
</tr>
<tr>
<td></td>
<td>2. Severe toxaemia (pre-eclampsia)</td>
</tr>
<tr>
<td></td>
<td>3. Exclude multiple pregnancy before drug administration</td>
</tr>
<tr>
<td></td>
<td>4. Cord prolapse</td>
</tr>
<tr>
<td>Precautions</td>
<td>1. If given IV may cause transient hypotension</td>
</tr>
<tr>
<td></td>
<td>2. Concurrent use with Methoxyflurane may cause hypotension</td>
</tr>
<tr>
<td>Route of administration</td>
<td>IM</td>
</tr>
<tr>
<td>Side effects</td>
<td>Uncommon via IM route:</td>
</tr>
<tr>
<td></td>
<td>Tachycardia</td>
</tr>
<tr>
<td></td>
<td>Bradycardia</td>
</tr>
<tr>
<td></td>
<td>Nausea</td>
</tr>
<tr>
<td>Special notes</td>
<td>Must be stored between 2 - 8°C</td>
</tr>
<tr>
<td></td>
<td>IM effects:</td>
</tr>
<tr>
<td></td>
<td>Onset: 2 – 4 minutes</td>
</tr>
<tr>
<td></td>
<td>Peak: n/a</td>
</tr>
<tr>
<td></td>
<td>Duration: 30 – 60 minutes</td>
</tr>
</tbody>
</table>
# Paracetamol

| Presentation | 500 mg tablets  
120 mg in 5 mL oral liquid (24 mg/mL)  
1000 mg in 100 mL soft pack (AAV only) |
|--------------|--------------------------------------------------|
| Pharmacology | An analgesic and antipyretic agent  
Actions:  
- Exact mechanism of action unclear; thought to inhibit prostaglandin synthesis in the CNS |
| Metabolism | By the liver; excreted by the kidneys |
| Primary emergency indications | 1. Mild pain  
2. Headache |
| Contraindications | 1. Hypersensitivity to paracetamol  
2. Children < 1 month of age  
3. Paracetamol already administered within past 4 hours  
4. Total paracetamol intake within past 24 hours exceeding 4 g (adults) or 60 mg/kg (children)  
5. Chest pain in suspected acute coronary syndrome |
| Precautions | 1. Impaired hepatic function or liver disease  
2. Elderly / frail  
3. Malnourished |
| Route of administration | Oral  
IV |
| Side effects | • Hypersensitivity reactions including severe skin rashes (rare)  
• Haematological reactions (rare) |
Special notes

<table>
<thead>
<tr>
<th>Table Cell</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There are several brands of Paracetamol available in Australia. Paracetamol is also found in many combination medicines, both prescription and over-the-counter.</td>
</tr>
<tr>
<td></td>
<td>Carefully determine previous Paracetamol intake before dose administration.</td>
</tr>
<tr>
<td></td>
<td>The usual dose of Paracetamol for children is 15 mg/kg per dose. The maximum total dose of 60 mg/kg therefore equates to 4 doses within a 24 hour period.</td>
</tr>
<tr>
<td></td>
<td>Hepatic damage is very rare when Paracetamol is taken at recommended dosages.</td>
</tr>
<tr>
<td></td>
<td>Paracetamol is not indicated for the treatment of fever in the emergency setting.</td>
</tr>
<tr>
<td><strong>Onset:</strong></td>
<td>30 minutes</td>
</tr>
<tr>
<td><strong>Peak:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
<td>4 hours</td>
</tr>
<tr>
<td>Presentation</td>
<td>12.5 mg in 1 mL glass ampoule</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>An anti-emetic</td>
</tr>
<tr>
<td>Actions:</td>
<td>Acts on several central neuro-transmitter systems</td>
</tr>
<tr>
<td>Metabolism</td>
<td>Metabolised by the liver; excreted by the kidneys</td>
</tr>
<tr>
<td>Primary emergency indications</td>
<td>1. Treatment or prophylaxis of nausea / vomiting for</td>
</tr>
<tr>
<td></td>
<td>• Motion sickness</td>
</tr>
<tr>
<td></td>
<td>• Planned aeromedical evacuation</td>
</tr>
<tr>
<td></td>
<td>• Known allergy or C/I to Ondansetron administration</td>
</tr>
<tr>
<td></td>
<td>• Headache irrespective of nausea / vomiting</td>
</tr>
<tr>
<td></td>
<td>• Vertigo</td>
</tr>
<tr>
<td>Contraindications</td>
<td>1. Circulatory collapse (cool, pale, clammy skin, tachycardia, hypotension)</td>
</tr>
<tr>
<td></td>
<td>2. CNS depression</td>
</tr>
<tr>
<td></td>
<td>3. Previous hypersensitivity</td>
</tr>
<tr>
<td></td>
<td>4. Patients &lt; 21 years of age</td>
</tr>
<tr>
<td></td>
<td>5. Pregnancy</td>
</tr>
<tr>
<td>Precautions</td>
<td>1. Hypotension</td>
</tr>
<tr>
<td></td>
<td>2. Epilepsy</td>
</tr>
<tr>
<td></td>
<td>3. Pts affected by alcohol or on anti-depressants</td>
</tr>
<tr>
<td>Route of administration</td>
<td>IM</td>
</tr>
<tr>
<td>Side effects</td>
<td>• Drowsiness</td>
</tr>
<tr>
<td></td>
<td>• Blurred vision</td>
</tr>
<tr>
<td></td>
<td>• Hypotension</td>
</tr>
<tr>
<td></td>
<td>• Sinus tachycardia</td>
</tr>
<tr>
<td></td>
<td>• Skin rash</td>
</tr>
<tr>
<td></td>
<td>• Extrapyramidal reactions (usually the dystonic type)</td>
</tr>
<tr>
<td>Special notes</td>
<td>IM effects</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td><strong>Onset:</strong> 20 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Peak:</strong> 40 minutes</td>
</tr>
<tr>
<td></td>
<td><strong>Duration:</strong> 6 hours</td>
</tr>
</tbody>
</table>
Presentation
- 50mg in 5mL glass vial

Mode of action
- Non-depolarising neuromuscular blocking agent
- Competes with acetylcholine to block cholinergic receptors located at the motor endplate of striated muscle

Indications
- Intubation, to provide skeletal muscle paralysis

Contraindications
- Nil significant

Precautions
- Status epilepticus – consult with receiving hospital for ongoing maintenance of paralysis if required for patient safety reasons

Adverse effects
- CV: tachycardia, hypotension
- Other: anaphylaxis (rare: <0.1%)  

Significant interactions
- Nil significant

Pregnancy
- Considered safe to use

Breastfeeding
- Considered safe to use

Administration advice
- **Route of administration:** IV, IO, IV infusion
- **Onset of action:** Adequate intubating conditions are established within 60 seconds in nearly all patients
- **Duration of action:** Varies depending on dose (up to 60 minutes for a 1mg/kg dose). However, repeat doses are administered prior to the previous dose wearing off to prevent any problems that may arise e.g. asynchronous ventilation, rise in ICP etc.

Notes
- Rocuronium is incompatible with several medications including dexamethasone and furosemide. Ensure each bolus dose is flushed thoroughly with Normal Saline
- Rocuronium is stable for up to 3 months when stored below 30°C, once removed from the branch refrigerator to stock a medication kit. Note the date of removal and discard any unused rocuronium after 3 months.

Infusion
- Rocuronium 10 mL (100 mg) undiluted in a 10 mL syringe. Administer at 5 mL/hr (50 mg/hr).
<table>
<thead>
<tr>
<th>Presentation</th>
<th>5 mg in 2.5 mL polyamp pMDI (100 mcg per actuation)</th>
</tr>
</thead>
</table>
| Pharmacology | A synthetic beta adrenergic stimulant with primarily beta 2 effects  
Actions:  
• Causes bronchodilatation |
| Metabolism   | By the liver; excreted by the kidneys |
| Primary emergency Indications | 1. Respiratory distress with suspected bronchospasm:  
• asthma  
• severe allergic reactions  
• COPD  
• smoke inhalation  
• oleoresin capsicum spray exposure |
| Contraindications | 1. Nil of significance in the above indications |
| Precautions  | 1. Large doses of Salbutamol have been reported to cause intracellular metabolic acidosis |
| Route of administration | Nebulised, pMDI |
| Side effects | • Sinus tachycardia  
• Muscle tremor (common) |
| Special notes | Salbutamol nebules / polyamps have a shelf life of one month after the wrapping is opened. The date of opening of the packaging should be recorded and the drug should be stored in an environment of < 30°C  
Although infrequently used, Salbutamol by IV infusion may be required during interhospital transfers of some women in premature labour  
The dose is to be prescribed and signed by the referring hospital medical officer  
**Nebulised effects:**  
**Onset:** 5 – 15 minutes  
**Peak:** n/a  
**Duration:** 15 – 50 minutes |
### Sodium Bicarbonate 8.4%

| Presentation | 50 mL prepared syringe  
100 mL glass bottle |
|--------------|--------------------------|
| Pharmacology | A hypertonic crystalloid solution  
Composition:  
- Contains sodium and bicarbonate ions in a solution of high pH  
Actions:  
- Raises pH |
| Metabolism | Sodium: excreted by the kidneys  
Bicarbonate: excreted by the kidneys as bicarbonate ion and by the lungs as CO₂ |
| Primary emergency Indications | 1. Cardiac arrest secondary to TCA overdose or hyperkalaemia  
2. Symptomatic TCA OD |
| Contraindications | 1. Nil in the above indications |
| Precautions | 1. Administration of Sodium Bicarbonate 8.4% must be accompanied by effective ventilation and ECC if required  
2. Since Sodium Bicarbonate 8.4% causes tissue necrosis, care must be taken to avoid leakage of the drug into the tissues  
3. Because of the high pH of this solution do not mix or flush any other drug or solution with Sodium Bicarbonate 8.4% |
| Route of administration | IV |
| Side effects |  
- Sodium overload may provoke pulmonary oedema  
- Excessive doses of Sodium Bicarbonate 8.4%, especially without adequate ventilation and circulation, may cause an intracellular acidosis |
| Special notes | IV effects:  
Onset: 1 – 2 minutes  
Peak: n/a  
Duration: Depends on cause and patient’s perfusion |
<table>
<thead>
<tr>
<th>Presentation</th>
<th>50 mg in glass vial with weight marked and pre-filled syringe containing water for IV administration (must reconstitute all drug then discard unwanted amount according to weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacology</td>
<td>Fibrinolytic, a modified form of tissue plasminogen activator (tPA) that binds to fibrin and converts plasminogen to plasmin</td>
</tr>
<tr>
<td>Metabolism</td>
<td>Metabolised by the liver</td>
</tr>
<tr>
<td>Primary emergency indications</td>
<td>1. Acute STEMI</td>
</tr>
</tbody>
</table>
| Contraindications (Exclusion criteria) | 1. Major surgery in the past 3 months  
2. Significant head injury in the past 3 months  
3. Major trauma in the past 3 months  
4. Stroke/TIA in the past 3 months  
5. ICH at any time  
6. GI or genitourinary bleed in the past month  
7. Current bleeding disorder, active bleeding (excluding menses) or bleeding tendencies  
8. Anticoagulants or glycoprotein IIb/IIIa inhibitors  
9. Allergy to tenecteplase or gentamicin |
| Precautions (Relative contraindications) | 1. Age ≥ 75 years  
2. Non-compressible vascular puncture  
3. History of liver disease  
4. SBP > 160 mmHg or DBP > 110 mmHg  
5. Low body weight  
6. Active peptic ulcer  
7. Anaemia  
8. Acute pericarditis or subacute bacterial endocarditis  
9. Traumatic or prolonged (>10 mins) CPR  
10. Pregnant or within 1 week post-partum  
11. HR > 120 bpm |
| Route of administration | IV, using vial adapter on pre-prepared syringe, as single bolus over 10 seconds; IO (consult) |
### Side effects

<table>
<thead>
<tr>
<th>Side effects</th>
<th>Bleeding – including injection sites, ICH, internal bleeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transient hypotension</td>
</tr>
<tr>
<td><strong>Infrequent</strong></td>
<td></td>
</tr>
<tr>
<td>• Allergic reactions including fever,</td>
<td></td>
</tr>
<tr>
<td>chills, rash, nausea, headache,</td>
<td></td>
</tr>
<tr>
<td>bronchospasm, vasculitis, nephritis</td>
<td></td>
</tr>
<tr>
<td>and anaphylaxis</td>
<td></td>
</tr>
<tr>
<td><strong>Rare</strong></td>
<td></td>
</tr>
<tr>
<td>• Cholesterol embolism</td>
<td></td>
</tr>
</tbody>
</table>

### Special notes

- Weight optimised dosing improves efficacy and safety outcomes in drugs with narrow therapeutic index e.g. Fibrinolytics
- Other drugs which affect the clotting process may increase risk of bleeding associated with Tenecteplase.
### Presentation
- 10 mL polyamp

### Pharmacology
- Water for injection is a clear, colourless, particle free, odourless and tasteless liquid. It is sterile, with a pH of 5.6 to 7.7 and contains no antimicrobial agents.

### Metabolism
- Distributed throughout the body; excreted by the kidneys.

### Primary emergency Indications
- 1. Used to dissolve Ceftriaxone in preparation for IV injection

### Contraindications
- 1. Nil in the above indication

### Precautions
- 1. Nil in the above indication

### Route of administration
- IV

### Side effects
- Nil

### Special notes
- Nil
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Abdominal Aortic Aneurysm</td>
</tr>
<tr>
<td>AAV</td>
<td>Air Ambulance Victoria</td>
</tr>
<tr>
<td>ACS</td>
<td>Acute Coronary Syndromes</td>
</tr>
<tr>
<td>ADLs</td>
<td>Activities of Daily Living</td>
</tr>
<tr>
<td>AF</td>
<td>Atrial Fibrillation</td>
</tr>
<tr>
<td>AIVR</td>
<td>Accelerated Idioventricular Rhythm</td>
</tr>
<tr>
<td>ALS</td>
<td>Advanced Life Support</td>
</tr>
<tr>
<td>AMI</td>
<td>Acute Myocardial Infarction</td>
</tr>
<tr>
<td>AP</td>
<td>Ambulance Paramedic</td>
</tr>
<tr>
<td>APH</td>
<td>Antepartum haemorrhage</td>
</tr>
<tr>
<td>APO</td>
<td>Acute Pulmonary Oedema</td>
</tr>
<tr>
<td>ARV</td>
<td>Adult Retrieval Victoria</td>
</tr>
<tr>
<td>AV</td>
<td>Ambulance Victoria</td>
</tr>
<tr>
<td>A-V</td>
<td>Atrioventricular</td>
</tr>
<tr>
<td>AVRT</td>
<td>A-V re-entry tachycardia</td>
</tr>
<tr>
<td>AVNRT</td>
<td>A-V nodal re-entry tachycardia</td>
</tr>
<tr>
<td>Ax</td>
<td>Assessment</td>
</tr>
<tr>
<td>BGL</td>
<td>Blood Glucose Level</td>
</tr>
<tr>
<td>BLS</td>
<td>Basic Life Support</td>
</tr>
<tr>
<td>BP</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>bpm</td>
<td>beats per minute</td>
</tr>
</tbody>
</table>
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BVM</td>
<td>Bag-Valve-Mask</td>
</tr>
<tr>
<td>C/I</td>
<td>Contraindication</td>
</tr>
<tr>
<td>CBR</td>
<td>Chemical / Biological / Radiation</td>
</tr>
<tr>
<td>CCF</td>
<td>Congestive Cardiac Failure</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>C.O.</td>
<td>Cardiac Output (L/min.)</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CO₂</td>
<td>Carbon Dioxide</td>
</tr>
<tr>
<td>CPAP</td>
<td>Continuous Positive Airway Pressure</td>
</tr>
<tr>
<td>CPG</td>
<td>Clinical Practice Guideline</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiopulmonary Resuscitation</td>
</tr>
<tr>
<td>CWI</td>
<td>Clinical Work Instruction</td>
</tr>
<tr>
<td>D5W</td>
<td>5% Dextrose</td>
</tr>
<tr>
<td>DBP</td>
<td>Diastolic Blood Pressure</td>
</tr>
<tr>
<td>DCCS</td>
<td>Direct Current Counter Shock</td>
</tr>
<tr>
<td>DCI</td>
<td>Decompression Illness</td>
</tr>
<tr>
<td>DCR</td>
<td>Direct Current Reversion</td>
</tr>
<tr>
<td>DKA</td>
<td>Diabetic Ketoacidosis</td>
</tr>
<tr>
<td>DM</td>
<td>Duty Manager</td>
</tr>
<tr>
<td>dpm</td>
<td>drops per minute</td>
</tr>
<tr>
<td>ECC</td>
<td>External Cardiac Compression</td>
</tr>
</tbody>
</table>
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECG</td>
<td>Electrocardiogram</td>
</tr>
<tr>
<td>ECR</td>
<td>Endovascular Clot Retrieval</td>
</tr>
<tr>
<td>EtCO(_2)</td>
<td>End-tidal carbon dioxide</td>
</tr>
<tr>
<td>ETT</td>
<td>Endotracheal tube</td>
</tr>
<tr>
<td>FG</td>
<td>French Gauge</td>
</tr>
<tr>
<td>FHR</td>
<td>Fetal Heart Rate</td>
</tr>
<tr>
<td>FRC</td>
<td>Functional Residual Capacity</td>
</tr>
<tr>
<td>g</td>
<td>gram/s</td>
</tr>
<tr>
<td>GCS</td>
<td>Glasgow Coma Scale</td>
</tr>
<tr>
<td>GIT</td>
<td>Gastrointestinal Tract</td>
</tr>
<tr>
<td>GR</td>
<td>Grade</td>
</tr>
<tr>
<td>GTN</td>
<td>Glyceryl trinitrate</td>
</tr>
<tr>
<td>hr</td>
<td>hour</td>
</tr>
<tr>
<td>HR</td>
<td>Heart Rate</td>
</tr>
<tr>
<td>Hx</td>
<td>History</td>
</tr>
<tr>
<td>ICH</td>
<td>Intracranial haemorrhage</td>
</tr>
<tr>
<td>ICP</td>
<td>Intracranial pressure</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>IFS</td>
<td>Intubation Facilitated by Sedation</td>
</tr>
<tr>
<td>IHT</td>
<td>Interhospital transfer</td>
</tr>
<tr>
<td>IM</td>
<td>Intramuscular</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>IN</td>
<td>Intranasal</td>
</tr>
<tr>
<td>IO</td>
<td>Intraosseous</td>
</tr>
<tr>
<td>IPPV</td>
<td>Intermittent Positive Pressure Ventilation</td>
</tr>
<tr>
<td>IU</td>
<td>International Unit</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenous</td>
</tr>
<tr>
<td>J</td>
<td>Joules</td>
</tr>
<tr>
<td>JVP</td>
<td>Jugular Venous Pressure</td>
</tr>
<tr>
<td>KED</td>
<td>Kendrick Extrication Device</td>
</tr>
<tr>
<td>kg</td>
<td>kilogram/s</td>
</tr>
<tr>
<td>L</td>
<td>litre</td>
</tr>
<tr>
<td>LOC</td>
<td>Loss of Consciousness</td>
</tr>
<tr>
<td>LMO</td>
<td>Local Medical Officer</td>
</tr>
<tr>
<td>L/min</td>
<td>litres per minute</td>
</tr>
<tr>
<td>LVF</td>
<td>Left Ventricular Failure</td>
</tr>
<tr>
<td>MAO</td>
<td>monoamine oxidase</td>
</tr>
<tr>
<td>MASS</td>
<td>Melbourne Ambulance Stroke Screen</td>
</tr>
<tr>
<td>max.</td>
<td>maximum</td>
</tr>
<tr>
<td>MCA</td>
<td>Motor Car Accident</td>
</tr>
<tr>
<td>mcg</td>
<td>microgram/s</td>
</tr>
<tr>
<td>mg</td>
<td>milligram/s</td>
</tr>
<tr>
<td>MI</td>
<td>Myocardial Infarction</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>MICA</td>
<td>Mobile Intensive Care Ambulance</td>
</tr>
<tr>
<td>min</td>
<td>minutes</td>
</tr>
<tr>
<td>mL</td>
<td>millilitres</td>
</tr>
<tr>
<td>mL/hr</td>
<td>millilitres per hour</td>
</tr>
<tr>
<td>mmHg</td>
<td>millimetres of mercury</td>
</tr>
<tr>
<td>mmol/L</td>
<td>millimoles per litre</td>
</tr>
<tr>
<td>MOI</td>
<td>Mechanism of Injury</td>
</tr>
<tr>
<td>MP</td>
<td>MICA Paramedic</td>
</tr>
<tr>
<td>MSU</td>
<td>Mobile Stroke Unit</td>
</tr>
<tr>
<td>MTS</td>
<td>Major Trauma Service</td>
</tr>
<tr>
<td>MV</td>
<td>Minute Ventilation</td>
</tr>
<tr>
<td>Mx</td>
<td>Manage/Management</td>
</tr>
<tr>
<td>NB</td>
<td>Note well</td>
</tr>
<tr>
<td>neb</td>
<td>nebulizable</td>
</tr>
<tr>
<td>NEPT</td>
<td>Non Emergency Patient Transport</td>
</tr>
<tr>
<td>NESB</td>
<td>Non-English Speaking Background</td>
</tr>
<tr>
<td>NG</td>
<td>Nasogastric</td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
</tr>
<tr>
<td>NPA</td>
<td>Nasopharyngeal Airway</td>
</tr>
<tr>
<td>NSTEACS</td>
<td>Non-ST Elevation Acute Coronary Syndromes</td>
</tr>
<tr>
<td>O₂</td>
<td>Oxygen</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------------------------------</td>
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<tr>
<td>OD</td>
<td>Overdose</td>
</tr>
<tr>
<td>OG</td>
<td>Orogastric</td>
</tr>
<tr>
<td>OPA</td>
<td>Oropharyngeal Airway</td>
</tr>
<tr>
<td>PCI</td>
<td>Percutaneous Coronary Intervention</td>
</tr>
<tr>
<td>PCR</td>
<td>Patient Care Record</td>
</tr>
<tr>
<td>PE</td>
<td>Pulmonary Embolus</td>
</tr>
<tr>
<td>PEA</td>
<td>Pulseless Electrical Activity</td>
</tr>
<tr>
<td>PEEP</td>
<td>Positive End-Expiratory Pressure</td>
</tr>
<tr>
<td>PHx</td>
<td>Past History</td>
</tr>
<tr>
<td>PIP</td>
<td>Peak Inspiratory Pressure</td>
</tr>
<tr>
<td>PIPER</td>
<td>Paediatric Infant Perinatal Emergency Retrieval</td>
</tr>
<tr>
<td>pMDI</td>
<td>Pressurised Metered Dose Inhaler</td>
</tr>
<tr>
<td>PO</td>
<td>Per oral</td>
</tr>
<tr>
<td>PPH</td>
<td>Primary Postpartum Haemorrhage</td>
</tr>
<tr>
<td>PSA</td>
<td>Perfusion Status Assessment</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>PSV</td>
<td>Pressure Support Ventilation</td>
</tr>
<tr>
<td>Pt</td>
<td>Patient</td>
</tr>
<tr>
<td>PV</td>
<td>Per Vagina</td>
</tr>
<tr>
<td>QRS</td>
<td>QRS complex of ECG</td>
</tr>
<tr>
<td>R&amp;R</td>
<td>Rest and Reassurance</td>
</tr>
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</table>
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>RCH</td>
<td>Royal Children's Hospital</td>
</tr>
<tr>
<td>ROSC</td>
<td>Return of Spontaneous Circulation</td>
</tr>
<tr>
<td>RSA</td>
<td>Respiratory Status Assessment</td>
</tr>
<tr>
<td>RSI</td>
<td>Rapid Sequence Intubation</td>
</tr>
<tr>
<td>RTA</td>
<td>Road Traffic Accident</td>
</tr>
<tr>
<td>RUQ</td>
<td>Right Upper Quadrant</td>
</tr>
<tr>
<td>R/V</td>
<td>Rendezvous</td>
</tr>
<tr>
<td>Rx</td>
<td>Treat/Treatment</td>
</tr>
<tr>
<td>SA</td>
<td>Sinoatrial</td>
</tr>
<tr>
<td>SAH</td>
<td>Sub-arachnoid Haemorrhage</td>
</tr>
<tr>
<td>SDH</td>
<td>Subdural Haematoma</td>
</tr>
<tr>
<td>S Rural</td>
<td>Selected AV Rural APs permitted to perform skill</td>
</tr>
<tr>
<td>SCI</td>
<td>Spinal Cord Injury</td>
</tr>
<tr>
<td>sec</td>
<td>second</td>
</tr>
<tr>
<td>SGA</td>
<td>Supra-Glottic Airway</td>
</tr>
<tr>
<td>SIMV</td>
<td>Synchronous Intermittent Mandatory Ventilation</td>
</tr>
<tr>
<td>SL</td>
<td>Sublingual</td>
</tr>
<tr>
<td>SOB</td>
<td>Short of Breath</td>
</tr>
<tr>
<td>$\text{SpO}_2$</td>
<td>Saturation of haemoglobin with $O_2$ measured by pulse oximetry</td>
</tr>
<tr>
<td>S/S</td>
<td>Signs/symptoms</td>
</tr>
<tr>
<td>SV</td>
<td>Stroke volume</td>
</tr>
</tbody>
</table>
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVT</td>
<td>Supraventricular Tachycardia</td>
</tr>
<tr>
<td>STEMI</td>
<td>ST Elevation Myocardial Infarction</td>
</tr>
<tr>
<td>TBI</td>
<td>Traumatic Brain Injury</td>
</tr>
<tr>
<td>TBSA</td>
<td>Total Burn Surface Area</td>
</tr>
<tr>
<td>TCA</td>
<td>Tricyclic Antidepressant</td>
</tr>
<tr>
<td>temp</td>
<td>Temperature</td>
</tr>
<tr>
<td>TKVO</td>
<td>To Keep Vein Open</td>
</tr>
<tr>
<td>TPT</td>
<td>Tension Pneumothorax</td>
</tr>
<tr>
<td>Tx</td>
<td>Transport</td>
</tr>
<tr>
<td>UA</td>
<td>Unstable Angina</td>
</tr>
<tr>
<td>VF</td>
<td>Ventricular Fibrillation</td>
</tr>
<tr>
<td>vo1</td>
<td>Volume</td>
</tr>
<tr>
<td>vs</td>
<td>Versus</td>
</tr>
<tr>
<td>VSS</td>
<td>Vital Signs Survey</td>
</tr>
<tr>
<td>VST</td>
<td>Victorian Stroke Telemedicine</td>
</tr>
<tr>
<td>VT</td>
<td>Tidal Volume</td>
</tr>
<tr>
<td>VT</td>
<td>Ventricular Tachycardia</td>
</tr>
<tr>
<td>WOB</td>
<td>Work of Breathing</td>
</tr>
<tr>
<td>Wt</td>
<td>Weight (kg)</td>
</tr>
</tbody>
</table>
Intraosseous (IO) route

- The use of the IO route is encouraged in all age groups (excluding preterm infants less than 1 kg) in circumstances when lifesaving drugs and/or fluid are required and IV access is delayed or not possible including:
  - Where ETT is indicated and sedation / paralysis pre or post ETT is required and timely IV access is not possible.
  - Cardiac arrest where there will be delay in gaining IV access.

- The nominated sites for use in AV practice are the proximal humerus (except for newborns), or the distal or proximal tibia.

Contraindications

- If any part of the limb is traumatised or infected.
- The proposed site cannot be adequately cleansed.
- Osteogenesis imperfecta.

Distal attempts into the same limb where an attempt has already been made should not occur.

Precautions

- Follow relevant CWI for IO device.
- Care should be taken not to inject air.
- Beware of extravasation.

Complications

- Necrosis of surrounding soft tissue due to extravasation.
- Infection of bony tissue.
- IO insertion is usually not painful in the conscious patient. It may on occasion be painful though to administer drugs / fluids through an IO cannula.

Local anaesthesia

- If patient conscious, administer IO Lignocaine 1% local anaesthesia slowly prior to infusing drugs/fluids after needle confirmed patent:
  - Adult (>30 kg): 0.5 mg/kg (maximum 40 mg IO)
  - Child (<30 kg): 0.5 mg/kg (maximum 20 mg IO)
The OG / NG tube may be inserted to relieve gastric distension in patients from all age groups.

It is particularly important in the paediatric age group where air entering the stomach during positive pressure ventilation may adversely affect diaphragmatic movement.

- Neonate 6 - 8 FG
  - < 4 years of age 12 FG
  - > 4 years of age 14 FG
An interhospital transfer (secondary transport) involves patient transport to a major centre or a specialised unit, which usually requires a timely response for best patient outcome. The decision to transfer should be based on clinical assessment and clinical condition; availability of expertise and resources required in transit; and consideration of the risk involved in transferring the patient. The specific level of resources will vary according to patient condition and other factors.

**Use of Non-emergency Pt transport (NEPT) providers**

The NEPT service is not an emergency ambulance service. There is now regulation of the NEPT providers and further information is available on http://www.health.vic.gov.au/nept.

**Emergency transfers**

This CPG is written from the perspective of emergency transfers. In more complex situations the patient must be evaluated and determined to be stable by an appropriate retrieval/referral service medical practitioner in consultation with AV. The decision for appropriateness of transfer and escort requirements should entail a medically shared decision made between AV, the retrieval / referral service and the referring medical practitioner.

**Escorts**

Accompanying practitioners (e.g. midwife / medical practitioner) and services may be required. The accompanying escort is to continue the maintenance of patient care and responsibility as appropriate and work collaboratively with the Paramedic. The Paramedic crew is to coordinate the transport and is to be actively involved in the overall management of the patient.

For unstable patients and/or those with complex medical needs that may require a medical escort when one is not available, the sending medical practitioner is to contact the AV Clinician and one of the specialist retrieval / referral services. In some instances where a medical escort is not available within a reasonable timeframe and the patient’s condition may measurably deteriorate if transfer is delayed, a shared decision may be made by AV in conjunction with the sending medical practitioner and relevant retrieval / referral service as to the suitability of transfer with an ALS / MICA Paramedic. The medical practitioner or retrieval / referral service remains accountable for the final decision made.

**Restraint of equipment and personnel**

All personnel travelling in the ambulance must be capable of being seated and restrained by seatbelts in designated passenger seats.

All items of equipment transported must be adequately restrained. The Paramedic is to ensure familiarity with the operation of the equipment they are to use prior to departure.

**Pharmacological agents / infusions**

Paramedics should ensure that they are briefed and familiar with any medications that are being sent with the patient for administration en route, including delivery devices. In general, interfacility medications that are outside the Paramedic’s scope of practice are not to be initiated en route. There may be circumstances (e.g. mental health patients requiring regular doses of sedation) where Paramedics are required to continue a treatment plan during a transfer. This is acceptable under this guideline providing that the treatment plan is appropriately documented by the Medical Practitioner and that Paramedics are properly briefed.

**Responsibility and accountability**

The referring hospital or medical practitioner is accountable for ensuring:

- the appropriate level of care is provided, e.g. a medical escort if required;
• a full handover of the patient’s clinical status, current management and the potential events which may occur during transport and their management; and

• prescription of the dose and/or rate of an IV infusion and the relevant treatment guideline, including potential side effects and actions to instigate if a medical escort is not provided. Such prescription is to be written and signed by the Medical Practitioner on the AV PCR.

The ALS / MICA Paramedic is to ensure that they are adequately briefed and prepared for the transfer and able to manage the patient’s clinical condition appropriately. If it is the judgement of the transferring Paramedic crew that the patient’s requirements are outside of their scope or practice or level of expertise, the referer must be informed immediately. A suitably trained Paramedic (e.g. MICA or flight MICA Paramedic), or provision of an escort should be sought by contacting the AV Clinician.

Where an unstable patient requires urgent inter-hospital transfer to receive lifesaving treatment, it may not be possible to provide a medical escort or to match the crew skill-mix with the potential acuity of the patient. In these extreme cases, such as a leaking aortic aneurism, an urgent operation is the only treatment option and rapid transport is the focus of AV care. In such cases an ALS resource is appropriate. A clinical management plan for the transporting crew should be clear and may include treatment options outside the ALS scope of practice. If the patient deteriorates, resuscitation orders could include the withholding of resuscitation. In the event of a patient deteriorating, where possible the paramedics will receive radio support from the clinician, ARV or the receiving hospital. Unfortunately, in some of these cases patient outcomes may be poor despite best efforts of all parties.

In any cases of doubt consultation and advice should be obtained from the Metro / Rural Clinician to ARV 1300 368 661. See WIN OPS 118/119 for further information.

Interhospital transfer of the patient with ACS

Patients with ACS, most commonly UA, STEMI or NSTEMI may be receiving drug infusion/s as part of their treatment regime such as GTN and/or Heparin and/or Tirofiban Hydrochloride. These infusions are to be administered by a controlled delivery infusion system. If the patient is not classified as h risk these infusions can be managed by an ALS Paramedic.

Maintenance of pharmacological treatment for some patients may include inotropic, vasopressor, and/or antiarrhythmic agents via an IV infusion as a part of their management. Some of these patients may be safely transferred without a medical escort in the direct care of a MICA Paramedic (in the context of emergency transfers as specified in Part 1. Interhospital transfers introduction).

As a general principle patients receiving hospital based thrombolytic therapy should not be transferred until the full dose/s are completed due to the potential for significant adverse side effects. Once the thrombolytic therapy has been completed and the patient is stable they may then undertake transfer. The level of care required in transit will be determined by the patients condition.

Interhospital transfer of the maternity patient

Refer to specific maternity emergency CPG.

Interhospital transfer of other patients

Patients may require IV fluids as part of their management during transport. Some infusions may also contain additives. These infusions and additives must be considered in the context of the patients total clinical status and management at that time.

Many patients can be safely managed without a MICA or medical escort in the direct care of an ALS Paramedic. For example, patients who are receiving infusions of crystalloid solutions, blood, opioids, chemotherapy drugs or additives (such as antibiotics or potassium chloride).
These drugs must be delivered by a controlled delivery system and the infusion is to have been commenced prior to transfer.

Patients with more complex drug therapy may be safely transferred without medical escort in the direct care of a MICA Paramedic in the context of emergency transfers (as specified in Part 1 Interhospital transfers introduction). For other patients such as those intubated and ventilated and/or have invasive monitoring devices, the transfer is to be discussed with the Metro / Rural AV Clinician. Their consultation with ARV will consider Emergency transfers (as specified in Part 1)

**Contacts**

<table>
<thead>
<tr>
<th>Paediatric Infant Perinatal Emergency Retrieval (PIPER) (previously NETS, PETS and PERS)</th>
<th>PH 1300 137 650</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Retrieval Victoria (ARV)</td>
<td>PH 1300 368 661</td>
</tr>
</tbody>
</table>
Family Violence

Key Information

- Do you have concerns that the patient or other person on scene has been harmed and/or is at risk of harm, abuse or neglect as a result of family violence and/or child abuse?

- Request Police attendance for immediate dangers
- Treat patient as per appropriate CPG

- Transport patient to the ED
- Report to Police or DHS child protection as appropriate
- Refer to support service as appropriate

Key Numbers

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria Police</td>
<td>000</td>
</tr>
<tr>
<td>1800 Respect (sexual assault, domestic and family violence)</td>
<td>24 hr service – 1800 737 732</td>
</tr>
<tr>
<td>Safe Steps (family violence)</td>
<td>24 hr service – 1800 015 188</td>
</tr>
<tr>
<td>CASA (sexual assault)</td>
<td>after hours – 1800 806 292</td>
</tr>
<tr>
<td>Seniors Rights Victoria (elder abuse)</td>
<td>10am-5pm M-F – 1300 368 821</td>
</tr>
</tbody>
</table>
Paramedics have a unique opportunity to observe the living conditions and interpersonal relationships of patients. Paramedics therefore have an important role to play in the recognition and care of victims of family violence and abuse. This information is designed to assist Paramedics to ‘Recognise, Respond and Refer’ to cases involving suspected or confirmed family violence and abuse (including child abuse and elder abuse).

Paramedic safety is paramount and a dynamic risk assessment including any dangers should form part of any clinical approach. Ensure personal and scene safety and request Police attendance if required.

**Recognise**

There are a number of ways that an episode of family violence may be recognised which include:

- The patient or someone else at scene discloses a history or threat of violence or abuse. This includes threats to kill/injure someone or damage property, reckless conduct, indecent acts, potential stalking behaviour or signs/ information that would constitute breaches of an intervention order or safety notice. It is important to act on the assumption that any information disclosed to Paramedics is true which includes being responsive to all patients including where intoxication, mental health history, and disability are features.

- An episode of family violence or abuse is witnessed by Paramedics.

- Patient history and/or assessment raises Paramedic suspicion of actual or potential violence or abuse (see below).

- Paramedics have concerns for a person other than the patient (e.g. child of patient or another family member).

Also consider the following information during scene and patient assessment:

- Family violence can occur across a range of relationships including intimate partners (current and previous), parents, siblings, children/adolescents, older or younger relatives, same sex partners and carers. It extends beyond physical and sexual violence and abuse and may include psychological, emotional or economic abuse, neglect or a combination of these.

- At risk groups include women who are pregnant or have recently given birth, Aboriginal or Torres Strait Islanders, those from a culturally and linguistically diverse (CALD) background, people who live in rural areas, the long term unemployed, those with a disability, and lesbian, gay, bisexual or transgender individuals. Other known risk factors for family violence include mental illness, drug/alcohol abuse, recent separation and financial difficulties

- Victims of family violence may present with a range of injuries, illnesses or complaints. Paramedics need to consider patient history, presentation, patterns of injury, risk factors and environmental cues when considering the possibility of violence or abuse. Victims may appear nervous, ashamed, or evasive or give an unconvincing explanation of injuries. They may present with injuries consistent with violence or with psychological symptoms such as anxiety, panic attacks or depression. Victims can also be very good at covering for perpetrators for varied reasons including to protect children or for fear of reprisal.

For suspected child abuse/child at risk, consider the following:
Child abuse may involve physical abuse, sexual abuse, psychological/emotional abuse and neglect. Children witnessing other family members experiencing violence is considered a form of child abuse. The term “children” in this context refers to individuals up to and including 17 years of age.

Risk factors include a history of family violence, parent/caregiver history of drug/alcohol abuse or mental health issues, poverty or social isolation and poor maternal and child health. Many families experience more than one of these risk factors.

Fractures and bruises in pre-mobile children, bruises over relatively protected parts of the body such as behind the ears, neck, trunk and buttocks and patterned bruising should raise suspicion of a non-accidental cause. Contact burns on an unusual body part (such as the genitals or the back of the hand) or burns in the shape of a specific object (e.g. cigarette end or the end of a lighter) should also raise suspicion. A delay in seeking medical treatment, an inconsistent explanation of the injury or no explanation at all may also raise suspicion of non-accidental injury.

Poor hygiene, inappropriate clothing (e.g. lack of warm clothing in cold weather), lack of supervision or abandonment of parents/caregivers are all indicators of potential neglect.

Respond

Caring for the victim of family violence can be challenging. There are a number of key actions which should be considered by Paramedics.

- Request Police attendance via Duty Manager or 000 if there is risk to safety or a crime has been committed.
- Remove the patient to a safe environment if necessary (e.g. ambulance).
- Treat patient presentation and any injuries as per appropriate CPG.
- If the Paramedic suspects a crime has been committed, be mindful of minimising crime scene disruption whilst maintaining usual standards of patient care.
- Thoroughly document case details and any actions taken. Attention to detail is very important such as full name, times and who else is present.

Refer

A number of referral options are available for Paramedics to ensure the optimal care is provided for these patients.

- Transport to appropriate ED and handover case details, including details pertaining to any reasonable belief that you may have of violence or abuse.
- If the patient, a child and/or a family member is at risk, Paramedics are permitted to refer the case to the police or DHS Child Protection without the patient or parent/carer’s consent.
- If the patient refuses assistance and/or transport refer to appropriate agency (see below).
- If the patient refuses transport and referral and are not in immediate danger, leave the patient with the appropriate information so they can seek support at a later stage.

Further Referral Information

- If the patient refuses assistance and/or transport, there is no immediate danger and the patient is not at risk of harm, provide the patient with information regarding available support services.
- If you are concerned that there is a risk of danger to the person, or the person of concern is someone
other than the patient, notify Police via the Duty Manager or 000 and document details and actions taken.

- In the case of sexual assault, transport the patient to a hospital with the required forensic facilities if possible. Centres Against Sexual Assault (CASA) are based around Victoria and locations can be accessed via the Duty Manager. Transport any items of patient clothing which may be considered as evidence with the patient in separate paper bags if possible.

- If a referral is made against the patient’s wishes, it does not constitute a breach of professional ethics as per the Health Services Act or of the Mental Health Act. You do not need to tell the patient you are making the referral and you can do this once you have left the scene.

- If a patient or guardian refuses transport, or the person of concern is someone other than the patient, notify Police of the concern via the Duty Manager or 000 and document details and actions taken.

Further referral information specific for cases of suspected child abuse child at risk

- Ambulance Victoria Paramedics are required to report any suspected child abuse situation as per AV Family Violence & Child Abuse Policy.

- Any adult who forms a reasonable belief that a sexual offence has been committed by an adult against a child under 16 has an obligation to report that information to police. Failure to disclose the information to police is a criminal offence under Victorian law.

- Confidentiality is provided for reporters as per the Children, Youth and Families Act 2005 and prevents the disclosure of the name or any information likely to lead to the identification of a person who has made a report, unless the court decides that in the interests of justice evidence is required to be given.

- If there are any urgent concerns regarding a child’s immediate welfare call the Police on 000. For less urgent concerns that may relate to the long-term wellbeing of a child, Paramedics are encouraged to notify DHS Child Protection on 13 12 78.

General Care

- It is important to communicate with victims of family violence or abuse in an empathic, respectful and supportive manner. Ensure patient privacy if possible. Explain your concerns prior to asking any probing questions e.g. “I’m concerned for your safety”.

- In the case of children, it is very important that any questions are limited to a normal clinical assessment. It is critical to any subsequent or ongoing investigation that leading questions or forensic questioning are not initiated by Paramedics. All concerns should be communicated to the Police, DHS Child Protection, or ED.

- In cases of potential family violence, detailed notes are essential. This will include documenting conversations at scene and en route to hospital, observations of the scene (including diagrams if necessary) and whether any potential evidence (such as patient clothing) is removed from the scene. These notes may be required and relied on in court at a later date.

- For patients not actively referred to the Police, the following support services are available for victims and families:
### Self-care

- Cases involving interpersonal violence and/or abuse can be confronting for Paramedics for various reasons. Consider contacting Peer Support or the VACU psychologist via 1800 MANERS (1800 626 377) if you would like to talk to someone about an experience or event.

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Victoria Police</td>
<td>000</td>
</tr>
</tbody>
</table>
• Please refer to OWI PRO/OPS/108 – PTP605 Management of Deceased Patients which outlines the procedure for managing the sudden unexpected death of an infant or child. If you are not sure, contact the Duty Manager for advice.

• SIDS and Kids Victoria provides bereavement support to families following the sudden and unexpected death of a child from 20 weeks gestation to 6 years of age (up to 18 years of age in some country regions). SIDS and Kids Victoria has a 24 hour telephone service. Phone 1300 308 307.

• The death of a baby or young child is extremely distressing for all involved. Peer Support will contact you (they receive an automated alert) or alternatively they can be contacted directly by staff via 1800 MANERS (1800 626 377).
• Listen to the patient.
• Use the patient’s name to personalise the interaction.
• Use open-ended questions.
• Use calm, consistent, even tone of voice, even if patients communication style becomes hostile or aggressive.
• Avoid “no” language which may prompt an aggressive response, e.g. “I'm sorry, our policy doesn’t allow me to do that but I can offer you other assistance.”
• Allow the patient as much personal space as possible whilst maintaining control of the scene.
• Avoid too much eye contact as this can increase fear in some paranoid patients.
### IV fluid calculations

<table>
<thead>
<tr>
<th>Standard giving set:</th>
<th>20 drops = 1 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microdrip set:</td>
<td>60 microdrops = 1 mL</td>
</tr>
<tr>
<td>Drops per minute =</td>
<td>( \text{Drops per mL x volume} ) ( \text{time} )</td>
</tr>
</tbody>
</table>
### Drug dilutions

<table>
<thead>
<tr>
<th>CPG</th>
<th>Dilution</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO401</td>
<td>Morphine increments</td>
<td>Dilute <strong>Morphine 10 mg</strong> to 10 mL with <strong>9 mL Normal Saline</strong></td>
</tr>
<tr>
<td>P0501</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| A404    | Amiodarone Infusion             | **Syringe Pump** - Add Amiodarone **5 mg/kg** (up to a max. 300 mg) to D5W to make up 50 mL. Run at a rate of 150 mL/hr (i.e. to be delivered over 20 minutes)
|         |                                 | **Spring Loaded Infusion Device** - Add Amiodarone **5 mg/kg** up to 300 mcg (max. 6 mL of solution) to **D5W** to make up 10 mL. Use either 10 mL in 30 minutes or 10 mL in 15 minutes infusion device administration set depending on availability. (This runs over 30 or 15 minutes as closest available infusion rate option)
|         |                                 | **Adult giving set** - Add Amiodarone **5 mg/kg** (max. 300mg) to **D5W** (100 mL) and run at 100 drops/minute (delivered over 20 minutes) |
| A0402   | Adrenaline Infusion             | Dilute **Adrenaline 3 mg** to 50 mL with **D5W/Normal Saline** (i.e. each 1 mL of resultant solution contains Adrenaline 60 mcg) |
| A0407   |                                 | **Adrenaline Infusions** must be clearly labelled with the name and dose of the additive drug and time of commencement |
| A0705   |                                 |                                                                             |
| A0402   | Adrenaline increments (10 mcg/mL) | Dilute **Adrenaline 1 mL** of 1:10,000 to 10 mL with **Normal Saline 9 mL** (i.e. each 1 mL of resultant solution contains Adrenaline 10 mcg) |
| A0407   |                                 |                                                                             |
| A0705   | Adrenaline increments (100 mcg/mL) | Dilute 1 mL **Adrenaline 1:1,000** solution to 10 mL with **Normal Saline 9 mL** (i.e. each 1 mL of resultant solution contains Adrenaline 100 mcg/mL) |
| A0302   | Morphine and Midazolam infusion | Dilute **Morphine 30 mg** and **Midazolam 30 mg** diluted to 30 mL with **Normal Saline** (i.e. each 1 mL contains 1 mg Morphine and 1 mg Midazolam) |
| A0501   | Ketamine                        | Dilute **Ketamine 200 mg** to 20 mL with **18 mL of Normal Saline** (10 mg / mL). Do not dilute for IM injection |
## Drug Dilutions - Paediatric

<table>
<thead>
<tr>
<th>CPG</th>
<th>Dilution</th>
<th>Description</th>
</tr>
</thead>
</table>
| P0704 | Adrenaline infusion (Paed)            | **Syringe pump**  
Adrenaline 300 mcg added to make 50 mL with 5% Dextrose or Normal Saline  
1 mL = 6 mcg  
1 mL/hr = 0.1 mcg/min  
At low flow rates in younger children an infusion may not be as effective as providing boluses. Clinical judgement should be applied to the most effective route of administration. |
| P0709 | Atropine (Paed)                       | Dilute 600 mcg Atropine 1 mL into Normal Saline 5 mL (i.e. each 1 mL contains 100 mcg)                                                   |
| P0201 | Amiodarone (Paed)                     | ≤ 6yrs: Add 2 mL (100 mg) Amiodarone (from 150 mg in 3 mL ampoule) to 8 mL D5W in a 10 mL syringe  
≥ 6yrs: draw up 150 mg in 3 mL as required, no dilution                                                                                 |
| P0301 | Fentanyl bolus (Paed)                 | Dilute 100 mcg Fentanyl to 10 mL with Normal Saline 8 mL to make a solution of 10 mcg/mL in one syringe                                      |
| P0301 | Midazolam bolus (Paed)                | Dilute 15 mg Midazolam with D5W/Normal Saline 12 mL to make 15 mL (i.e. each 1 mL contains 1 mg)                                           |
| P0301 | Morphine and Midazolam infusion (Paed) | Dilute 15 mg Morphine and 15 mg Midazolam to 15 mL with Normal Saline (i.e. each 1 mL contains 1 mg Morphine and 1 mg Midazolam)            |
Crisis counselling – Peer Support service

Where staff are exposed to critical incidents or require psychological/emotional support, the following services are available within AV.

Nominated Peer Support staff are rostered for contacts. All staff are encouraged to provide notification of critical incidents.

1800 MANERS
(1800 626 377)

1. Peer support
2. VACU counselling line
3. Emergency services chaplain
4. Health, safety, and welfare including work cover
5. Police statements and court attendance

This service is available to all employees and immediate family members ACOs and CERTs.

Additional support agencies - Paramedics and the public

- Road Trauma Support Team: telephone 1300 367 797 (for members of the public)
- Support After Suicide (03) 9427 9899
- Bereavement Counselling and Support Service (03) 9265 2111
- SIDS and Kids 1300 308 307
- Life Line 13 11 14
- Kids Help Line 1800 551 800
- Nurse-On-Call 1300 60 60 24
Paramedics can access the TIS directly on the phone number below and by quoting client codes for AV. An English-speaking operator will request the language and dialect and connect the appropriate interpreter. There is no charge to the patient.

This service can be used to improve communication when there is a language barrier. For Pts who have limited comprehension of English, this service will assist to obtain a detailed history and perform thorough assessments. This also enables Paramedics to provide more culturally appropriate assistance to Pts from diverse backgrounds.

**Ambulance Priority Line**

1300 655 010

**Paramedics to quote**

Client Code number of **C503484**

Name of Paramedic may be requested by interpreter service operator

**Interpreter symbol**

The national interpreter symbol helps people from non-English-speaking backgrounds identify where they can get language assistance, including interpreters, when using government services.

Launched in May 2006, the symbol makes it easier for Victorians with limited English skills to access a whole range of services including medical services, Police and emergency services.

The interpreter symbol is displayed by government and government-funded services at places such as public hospitals, community health centres, local councils, Police stations, employment offices, migrant resource centres and housing offices.
### Adult

100 compressions per min

<table>
<thead>
<tr>
<th>SGA / ETT</th>
<th>30 comp - 2 vent (1 or 2 operator)</th>
<th>Pause for ventilations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post SGA / ETT</td>
<td>15 comp - 1 vent (1 or 2 operator)</td>
<td>No pause for ventilations</td>
</tr>
<tr>
<td>DCCS</td>
<td>200 J; 1 shock; 2 min CPR; pulse</td>
<td></td>
</tr>
</tbody>
</table>

### Infants & Children

100 compressions per min

<table>
<thead>
<tr>
<th>SGA / ETT</th>
<th>30:2 (1 operator) 15:2 (2 operators)</th>
<th>Pause for ventilations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post SGA / ETT</td>
<td>15 comp - 2 vent (1 or 2 operator)</td>
<td>No pause for ventilations</td>
</tr>
<tr>
<td>DCCS</td>
<td>4 J/kg; 1 shock; 2 min CPR; pulse</td>
<td></td>
</tr>
</tbody>
</table>

### Newborn

90 compressions per min

<table>
<thead>
<tr>
<th>CPR</th>
<th>3:1 (1 or 2 operator)</th>
<th>Pause for ventilations</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCCS</td>
<td>4 J/kg; 1 shock; 2 min CPR; pulse</td>
<td></td>
</tr>
</tbody>
</table>
Adults: Biphasic 200 J

Paediatric patients: Biphasic 4 J/kg (see table below)

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight</th>
<th>4 J/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3.5 kg</td>
<td>15 J</td>
</tr>
<tr>
<td>2 months</td>
<td>5 kg</td>
<td>20 J</td>
</tr>
<tr>
<td>5 months</td>
<td>7 kg</td>
<td>30 J</td>
</tr>
<tr>
<td>1 yr</td>
<td>10 kg</td>
<td>50 J</td>
</tr>
<tr>
<td>2 yrs</td>
<td>12 kg</td>
<td>50 J</td>
</tr>
<tr>
<td>3 yrs</td>
<td>14 kg</td>
<td>70 J</td>
</tr>
<tr>
<td>4 yrs</td>
<td>16 kg</td>
<td>70 J</td>
</tr>
<tr>
<td>5 yrs</td>
<td>18 kg</td>
<td>85 J</td>
</tr>
<tr>
<td>6 yrs</td>
<td>20 kg</td>
<td>85 J</td>
</tr>
<tr>
<td>7 yrs</td>
<td>22 kg</td>
<td>100 J</td>
</tr>
<tr>
<td>8 yrs</td>
<td>24 kg</td>
<td>100 J</td>
</tr>
<tr>
<td>9 yrs</td>
<td>26 kg</td>
<td>120 J</td>
</tr>
<tr>
<td>10 yrs</td>
<td>33 kg</td>
<td>150 J</td>
</tr>
<tr>
<td>11 yrs</td>
<td>36 kg</td>
<td>150 J</td>
</tr>
</tbody>
</table>
## Synchronised Cardioversion

### CPG F0021

<table>
<thead>
<tr>
<th>Rhythm</th>
<th>Initial</th>
<th>Subsequent</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT</td>
<td>150 J (X2)</td>
<td>200 J</td>
</tr>
<tr>
<td>SVT</td>
<td>150 J (X2)</td>
<td>200 J</td>
</tr>
</tbody>
</table>

Based on adult patients using biphasic defibrillator.
<table>
<thead>
<tr>
<th>Age</th>
<th>Ventilation rate (breaths per min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small child (1-4 yrs)</td>
<td>12-15</td>
</tr>
<tr>
<td>Medium child (5-11 yrs)</td>
<td>10-14</td>
</tr>
<tr>
<td>Adult</td>
<td>5-8 (Vt 6-7 mL/kg)</td>
</tr>
</tbody>
</table>

For paediatrics, use Vt sufficient to achieve visible rise and fall of the chest. Gentle lateral chest pressure may assist during expiration.

Allow long expiratory time with gentle lateral chest pressure. Moderately high inspiratory pressures.
<table>
<thead>
<tr>
<th>i-gel size</th>
<th>Pt weight guide*</th>
<th>Max size of gastric tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>2 - 5 kg</td>
<td>N/A</td>
</tr>
<tr>
<td>1.5</td>
<td>5 - 12 kg</td>
<td>10</td>
</tr>
<tr>
<td>2.0</td>
<td>10 - 25 kg</td>
<td>12</td>
</tr>
<tr>
<td>2.5</td>
<td>25 - 35 kg</td>
<td>12</td>
</tr>
<tr>
<td>3.0</td>
<td>30 - 60 kg</td>
<td>12</td>
</tr>
<tr>
<td>4.0</td>
<td>50 - 90 kg</td>
<td>12</td>
</tr>
<tr>
<td>5.0</td>
<td>90+ kg</td>
<td>14</td>
</tr>
</tbody>
</table>

*This is a guide only. Please ensure correct size is chosen corresponding to Pt airway size.
Stop

- **Amiodarone** must be diluted with **5% Dextrose**
- All other drugs can be diluted with **N/Saline** or **5% Dextrose**

Adrenaline

- **Adrenaline** 3 mg to 50 mL. 1 mL/hr = 1 mcg/min

Amiodarone

- **Amiodarone** 5 mg/kg (max. 300 mg) in all cases
- Syringe pump - dilute to 50 mL. Run @ 150 mL/hr
- Spring loaded - dilute to 10 mL. Run closest to 20 minutes

Morphine and Midazolam

- **Morphine** 30 mg + **Midazolam** 30 mg to 30 mL Run, @ 1-10 mL/hr

Fentanyl and Midazolam

- **Fentanyl** 300 mcg + **Midazolam** 30 mg to 30 mL, Run @ 1-10 mL/hr
All drugs can be made up with N/Saline or 5% Dextrose

**Adrenaline**

- Use 1mg/10mL (1:10,000) ampoule. Dilute 3 mL (300 mcg) to 50 mL with D5W/Normal Saline
- 1 mL/hr = 0.1 mcg/min
- Commence at 0.05 mcg/min, titrated to response
- Max of 0.5 mcg/kg/min asthma
- Max of 1 mcg/kg/min anaphylaxis

**Morphine and Midazolam**

- **Morphine** 15 mg + **Midazolam** 15 mg to 15 mL, Run @ 0.1-0.2 mL/kg/hr

**Fentanyl and Midazolam**

- **Fentanyl** 300 mcg + **Midazolam** 15 mg to 15 mL, Run @ 0.1-0.2 mL/kg/hr
Conversion table

<table>
<thead>
<tr>
<th>Conversion</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 g</td>
<td>1000 mg</td>
</tr>
<tr>
<td>1 mg</td>
<td>1000 mcg</td>
</tr>
<tr>
<td>0.1 mg</td>
<td>100 mcg</td>
</tr>
<tr>
<td>0.01 mg</td>
<td>10 mcg</td>
</tr>
</tbody>
</table>

Drug calculation

Volume to give = \[
\frac{\text{Strength required}}{\text{Strength in Stock}} \times \text{Stock volume}
\]
Paediatric-Adult Burns Assessment Ruler

Expressed as a % of Total Body Surface Area

1 year

18
18
18
14
14
14

2 years

17
18
18
14
14
14

3 years

16
16
18
15
15
15

This is an uncontrolled document, it is the reader's responsibility to ensure currency.
Chest + Abdomen = 18% Front or 18% Back

Limbs are measured circumferentially

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Choking

Assess severity

Effective cough
Position of comfort
Allow to cough
Monitor for clearance or deterioration

Absent or Ineffective cough

Conscious
Manual clearance if required

5 Back blows
(CWI/OPS/025)

5 Chest thrusts
(CWI/OPS/026 - Adults and children)
(CWI/OPS/027 - Infants)

Continue alternating
Monitor for clearance of deterioration
If patient becomes unconscious, manage as per "Unconscious"

Unconscious
Manual clearance if required

Laryngoscopy
(CWI/OPS/028 - Laryngoscopy)
(CWI/OPS/028 - Miller blade)

Magills/Suction
(CWI/OPS/029 - Magills)
(CWI/OPS/023 - Suction)

Obstruction removed
Assisted positive pressure ventilation until return of effective spontaneous ventilation
(CWI/OPS/059)

Obstruction remains

5 Ventilations
(CWI/OPS/059)

5 Compressions
(CWI/OPS/041 or CWI/OPS/043)
Repeat as required

Monitor for clearance or deterioration
If patient loses cardiac output, treat as per appropriate cardiac arrest guideline

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Related Resources


ALS paramedics MUST consult with the clinician prior to drawing up and administering IV adrenaline in the following patients:

- severe asthma not responding to initial treatment including at least one dose of IM adrenaline, or
- orolingual oedema secondary to tPA administration in stroke.

In a thunderstorm asthma event, where MICA and the clinician are not available, ALS paramedics should initiate treatment.

Hypertension is not a contraindication in this setting.

Exercise caution in the elderly patient that may be having an exacerbation of COPD. IV adrenaline is NOT indicated for COPD.

Patients may deteriorate despite IV adrenaline. Do not delay transport.

**Preparation:**

1. Open an ampoule of adrenaline 1/1,000 (1 mg/1 mL) and draw up the whole 1 mL (1000 mcg) from this ampoule into a 10 mL syringe
2. Dilute this 1 mL with 9 mL saline to a total of 10mL giving a concentration of 100mcg/mL
3. Discard 9mL of this leaving 1mL and then draw up 9mL saline to a total of 10mL, giving a final concentration of 10 mcg/mL
4. Administer 2 mL (20 mcg) IV and if not improved repeat at 2 min intervals

**Dose:**

Adrenaline 20 mcg (2 mL) IV
Repeat 20 mcg (2 mL) IV, 2 minutely as required*

*Patients with subtle improvements may still require IV adrenaline. Paramedics should only discontinue adrenaline where significant side effect occur or where the patient improves to speaking in full sentences (mild distress). Consult with the Clinician where there is any uncertainty.
Flowchart

**Status**
- Presenting condition/signs and CPG A0101 Clinical Approach

**Assess / Consider**
- More specific assessment criteria that may direct Rx pathway

**Action**
- Drug or intervention required for ALS / MICA

**Action**
- Unique drug or intervention required for MICA only or selected Rural ALS

**Stop**
- Either:
  - A contraindication exists
  - A high risk action follows
  - Care must be exercised to proceed
  - An immediate action is required
### Causes of altered consciousness

<table>
<thead>
<tr>
<th>Mnemonics</th>
<th>Causes of altered consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Alcohol/drug intoxication</td>
</tr>
<tr>
<td>E</td>
<td>Epilepsy (post ictal)</td>
</tr>
<tr>
<td>I</td>
<td>Insulin (diabetic) or other metabolic problem</td>
</tr>
<tr>
<td>O</td>
<td>Overdose or oxygen (hypoxia)</td>
</tr>
<tr>
<td>U</td>
<td>Underdose (of medication or drug/alcohol withdrawal)</td>
</tr>
<tr>
<td>T</td>
<td>Trauma to the head</td>
</tr>
<tr>
<td>I</td>
<td>Infection</td>
</tr>
<tr>
<td>P</td>
<td>Pain or psychiatric condition</td>
</tr>
<tr>
<td>S</td>
<td>Stroke or TIA</td>
</tr>
</tbody>
</table>

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