# Clinical Practice Guidelines Ambulance and MICA Paramedics

## 2018 Edition

AmbulanceVictoria

19 June 2019 Version 1.9

# Ambulance Victoria
# Clinical Practice Guidelines
## for Ambulance and MICA Paramedics
## 2018 Edition

**19 June 2019 -Version1.9**

## VERSION HISTORY

The following edits have been made to this electronic version which differ from the 2018 Edition hard copy.

**Version 1.1.0 - 29 January 2018**

- CPG A0601 - Inclusion of ALS consultation for IV adrenaline therapy for thunderstorm asthma; CPG N0201 - Correction of viability definition (i.e. <23 weeks); Further information Summary of approved changes - correction of A0403 SVT Amended Summary.

**Version 1.1.1 - 22 February 2018**

- Clarification of CPG A0805 Burns - Addition of fluid replacement formula for patients 12 - 15 yrs of age.

**Version1.2.0 - 09 March 2018**

- Updated guidelines: CPG A0001 Oxygen therapy and CPG A0203 Withholding or ceasing resuscitation

**Version1.2. 1-13 March 2018**

- Correction to CPG A0001 Oxygen therapy - target oxygen saturation in bleomycin and paraquat poisoning 85 - 88%

**Version1.3 - 22 May 2018**

- Rocuronium introduced for ongoing paralysis of the intubated patient. Pancuronium removed.
- Updated CPGs: CPG A0408 STEMI - inclusion IO administration of thrombolysis on consult with the on-call cardiologist; CPG A0704 Anaphylaxis & CPG P0704 Anaphylaxis (paediatric) - clarified Mx of bronchospasm; CPG A0708 Agitation - clarified Mx of paediatric patients

**Version 1.4- 12 July 2018**

- CPG A0108 Clinical flags - Red flags revised to include specific vital signs criteria and specific conditions. Any patient who meets any of these Clinical Red Flags MUST be transported to hospital.
- CPG A0105 Time Critical Guidelines - Medical Time Critical Guidelines deleted as they are superseded by the updated CPG A0108.
- References to Burnaid dressings removed.

**Version1.4.2 - 24 August 2018**

- CPG M0101 updated to include Female Genital Mutilation / Cutting

**Version1.5 - 22 October 2018**

- Trauma review related changes. Multiple CPGs modified. New Principles of Trauma Management CPG A0800 added. Haemorrhagic Hypovolaemia CPG A0801 major review and update. Chest Injuries CPG A0802 / CPG P0802 major review including introduction of ALS criteria for all ALS decompression of tension pneumothorax (adult CPG only). Traumatic Head Injury CPG A0803. Multiple changes. Spinal Injury CPG A0804. Modified NEXUS refined, updated immobilisation technique recommendations. Burns CPG A0805 / CPG P0803. Refined formatting to simplify content. Updated paediatric fluid resus TBSA. Fracture Management CPG A0806. Where there is neurological or vascular compromise, an attempt to realign a fracture or dislocation recommended. Use of pelvic splinting and the CT-6 traction splint together when indicated.
- Hypovolaemia CPG related references. As a result of the change of emphasis to the Hypovolaemia CPG to focus only on haemorrhagic hypovolaemia, other references to non-trauma related fluid management have been updated in the individual CPGs. In most cases, the updates support the same approach to IV fluid management. The following CPGs have all changed their reference to CPG A0801 Hypovolaemia. CPG A0701 Nausea and vomiting, CPG A0502 Headache, CPG A0704 Anaphylaxis, CPG A0705 Inadequate perfusion: Non-cardiogenic / Non-hypovolaemic, CPG A0807 Diving related emergencies, CPG A0902 Environmental hyperthermia: heat stress, CPG TR0202 Treat and Refer (Suspected Gastroenteritis), CPG M0201 Antepartum haemorrhage, CPG M0401 PPH.
- Update indication for Atropine for hypersalivation as a side effect of ketamine. This has been noted in special notes / side effects in the following CPGs: CPG A0501 / P0501 Pain Management, CPG A0708 Agitated Patient, Ketamine pharmacology (listed in side effects), and Atropine pharmacology (listed in indications) (note: paediatric use requires consult with RCH).

**Version1.6-17 December2018** - Updated reference to Maternity CPG M0301 Normal Birth and Newborn Baby CPG N0101 to clarify cutting of cord.
**Version1.7 - 11 February2019 -** Updated cardiac arrest CPGs (CPG A0201 and CPG P0201) to support High Performance CPR related changes.
**Version 1.8 - 19 March 2019 -** Updated indications for Transthoracic pacing in Bradycardia CPG A0402. Indication now 'Extremely poor perfusion' (Inadequate perfusion removed).
**Version 1.9 - 19 June 2019** - Addition of Voluntary Assisted Dying information in CPG A0203 Withholding or Ceasing Resuscitation


**Clinical Practice Guidelines**
for Ambulance and MICA Paramedics

Revised Edition
January 2018
Ambulance Victoria



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**Disclaimer**
These Clinical Practice Guidelines (CPGs) have been approved for use by Ambulance Victoria (AV) by the AV Medical Advisory Committee. Attention all other users: The content in these CPGs is for information and educational purposes only and is not intended to serve as medical advice or treatment. AV does not guarantee the accuracy or currency in the information provided in the CPG. AV does not accept any responsibility for loss or damage caused by the use of the information contained in the CPG. If you rely on the information in these CPGs you are responsible for ensuring by independent verification its accuracy, currency or completeness.

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# Foreword

The Ambulance Victoria Clinical Practice Guidelines (CPGs) 2018 Edition represent the latest developments in Paramedic practice in the state. The CPGs have been updated to include an expanded skill-set and with some exciting additions such as thrombolysis by ALS Paramedics in rural areas. These CPGs have also been refined when new evidence for improved outcomes is published. The ability to change practice with evolving evidence demonstrates a maturity within the organisation and a strong focus on providing the highest quality of pre-hospital healthcare possible.

One of the more significant updates in this edition is to cardiac arrest management. AV is proud of the results Paramedics have achieved in terms of resuscitation outcomes and with the update to the cardiac arrest CPG, comes an opportunity to further improve outcomes for patients who have suffered a cardiac arrest.

This edition also includes some new guidelines reflecting the changing services that the community needs from its Paramedics. The addition of a palliative care CPG follows a long period of development and consultation to identify the best way that AV can support patients who wish to remain at home at the end of their life. The addition of an elderly/frail non-injury falls CPG provides a framework for Paramedics to assess and support patients who may require assistance, but do not want or need to be taken to hospital.

I would like to take the opportunity to thank the Clinical Practice Development Committee, the Medical Advisory Committee and a large number of individual Paramedics for their commitment to advancing Paramedic practice by developing these guidelines. Thanks is also due to the many expert groups who provided advice to assist with ensuring that these guidelines are consistent with best practice. Every effort has been made to ensure the accuracy of these CPGs and they are constantly under review in light of emerging evidence. They should only be used with appropriate education and training.

I hope that this new edition of the CPGs will enable AV's Paramedics to continue to deliver the high standard of care to the Victorian community that has become a hallmark of the organisation.

Prof. Stephen Bernard

Medical Advisory Committee Chair

AV Medical Director

# Acknowledgements


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And all AV Paramedics who have provided feedback to assist in the continuous improvement of these guidelines.

# Index

# Guide to Abbreviations

| | |
|---|---|
| **AAA** | Abdominal Aortic Aneurysm |
| **AAV** | Air Ambulance Victoria |
| **ACS** | Acute Coronary Syndromes |
| **ADLs** | Activities of Daily Living |
| **AF** | Atrial Fibrillation |
| **AIVR** | Accelerated Idioventricular Rhythm |
| **ALS** | Advanced Life Support |
| **AMI** | Acute Myocardial Infarction |
| **AP** | Ambulance Paramedic |
| **APH** | Antepartum haemorrhage |
| **APO** | Acute Pulmonary Oedema |
| **ARV** | Adult Retrieval Victoria |
| **AV** | Ambulance Victoria |
| **A-V** | Atrioventricular |
| **AVRT** | A-V re-entry tachycardia |
| **AVNRT** | A-V nodal re-entry tachycardia |
| **Ax** | Assessment |
| **BGL** | Blood Glucose Level |
| **BLS** | Basic Life Support |
| **BP** | Blood Pressure |
| **bpm** | beats per minute |
| **BVM** | Bag-Valve-Mask |
| **C/I** | Contraindication |
| **CBR** | Chemical / Biological / Radiation |
| **CCF** | Congestive Cardiac Failure |
| **CNS** | Central Nervous System |
| **C.O.** | Cardiac Output (L/min.) |
| **COPD** | Chronic Obstructive Pulmonary Disease |
| **$CO_2$** | Carbon Dioxide |
| **CPAP** | Continuous Positive Airway Pressure |
| **CPG** | Clinical Practice Guideline |
| **CPR** | Cardiopulmonary Resuscitation |
| **CWI** | Clinical Work Instruction |
| **D5W** | 5% Dextrose |
| **DBP** | Diastolic Blood Pressure |
| **DCCS** | Direct Current Counter Shock |
| **DCI** | Decompression Illness |
| **DCR** | Direct Current Reversion |
| **DKA** | Diabetic Ketoacidosis |
| **DM** | Duty Manager |
| **dpm** | drops per minute |
| **ECC** | External Cardiac Compression |
| **ECG** | Electrocardiogram |
| **$EtCO_2$** | End-tidal carbon dioxide |
| **ETT** | Endotracheal tube |
| **FG** | French Gauge |
| **FHR** | Fetal Heart Rate |
| **FRC** | Functional Residual Capacity |
| **g** | gram/s |
| **GCS** | Glasgow Coma Scale |
| **GIT** | Gastrointestinal Tract |
| **GR** | Grade |
| **GTN** | Glyceryl trinitrate |
| **hr** | hour |
| **HR** | Heart Rate |
| **Hx** | History |
| **ICP** | Intracranial pressure |
| **ICU** | Intensive Care Unit |
| **IFS** | Intubation Facilitated by Sedation |
| **IHT** | Interhospital transfer |
| **IM** | Intramuscular |
| **IN** | Intranasal |
| **IO** | Intraosseous |
| **IPPV** | Intermittent Positive Pressure Ventilation |
| **IU** | International Unit |
| **IV** | Intravenous |
| **J** | Joules |
| **JVP** | Jugular Venous Pressure |
| **KED** | Kendrick Extrication Device |
| **kg** | kilogram/s |
| **L** | litre |
| **LOC** | Loss of Consciousness |
| **LMO** | Local Medical Officer |
| **L/min** | litres per minute |
| **LVF** | Left Ventricular Failure |
| **MAO** | monoamine oxidase |
| **max.** | maximum |
| **MCA** | Motor Car Accident |
| **mcg** | microgram/s |
| **mg** | milligram/s |
| **MI** | Myocardial Infarction |
| **MICA** | Mobile Intensive Care Ambulance |
| **min** | minutes |
| **mL** | millilitres |
| **mL/hr** | millilitres per hour |

# Guide to Abbreviations

| | |
|---|---|
| **mmHg** | millimetres of mercury |
| **mmol/L** | millimoles per litre |
| **MOI** | Mechanism of Injury |
| **MP** | MICA Paramedic |
| **MTS** | Major Trauma Service |
| **MV** | Minute Ventilation |
| **Mx** | Manage/Management |
| **NB** | Note well |
| **neb** | nebule |
| **NEPT** | Non Emergency Patient Transport |
| **NESB** | Non-English Speaking Background |
| **NG** | Nasogastric |
| **NICU** | Neonatal Intensive Care Unit |
| **NPA** | Nasopharyngeal Airway |
| **NSTEACS** | Non-ST Elevation Acute Coronary Syndromes |
| **$O_2$** | Oxygen |
| **OD** | Overdose |
| **OG** | Orogastric |
| **OPA** | Oropharyngeal Airway |
| **PCI** | Percutaneous Coronary Intervention |
| **PCR** | Patient Care Record |
| **PE** | Pulmonary Embolus |
| **PEA** | Pulseless Electrical Activity |
| **PEEP** | Positive End-Expiratory Pressure |
| **PHx** | Past History |
| **PIP** | Peak Inspiratory Pressure |
| **PIPER** | Paediatric Infant Perinatal Emergency Retrieval |
| **pMDI** | Pressurised Metered Dose Inhaler |
| **PO** | Per oral |
| **PPH** | Primary Postpartum Haemorrhage |
| **PSA** | Perfusion Status Assessment |
| **PPE** | Personal Protective Equipment |
| **PSV** | Pressure Support Ventilation |
| **Pt** | Patient |
| **PV** | Per Vagina |
| **QRS** | QRS complex of ECG |
| **R & R** | Rest and Reassurance |
| **RCH** | Royal Children's Hospital |
| **ROSC** | Return of Spontaneous Circulation |
| **RSA** | Respiratory Status Assessment |
| **RSI** | Rapid Sequence Intubation |
| **RTA** | Road Traffic Accident |
| **RUQ** | Right Upper Quadrant |
| **R/V** | Rendezvous |
| **Rx** | Treat/Treatment |
| **SA** | Sinoatrial |
| **SAH** | Sub-arachnoid Haemorrhage |
| **S Rural** | Selected AV Rural APs permitted to perform skill |
| **SCI** | Spinal Cord Injury |
| **sec** | second |
| **SGA** | Supra-Glottic Airway |
| **SIMV** | Synchronous Intermittent Mandatory Ventilation |
| **SL** | Sublingual |
| **SOB** | Short of Breath |
| **$SpO_2$** | Saturation of haemoglobin with $O_2$ measured by Pulse Oximetry |
| **S/S** | Signs/symptoms |
| **SV** | Stroke volume |
| **SVT** | Supraventricular Tachycardia |
| **STEMI** | ST Elevation Myocardial Infarction |
| **TBI** | Traumatic Brain Injury |
| **TBSA** | Total Burn Surface Area |
| **TCA** | Tricyclic Antidepressant |
| **temp** | Temperature |
| **TKVO** | To Keep Vein Open |
| **TPT** | Tension Pneumothorax |
| **Tx** | Transport |
| **UA** | Unstable Angina |
| **VF** | Ventricular Fibrillation |
| **vol** | Volume |
| **vs** | Versus |
| **VSS** | Vital Signs Survey |
| **$V_T$** | Tidal Volume |
| **VT** | Ventricular Tachycardia |
| **WOB** | Work of Breathing |
| **Wt** | Weight (kg) |

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# Graphic Guide

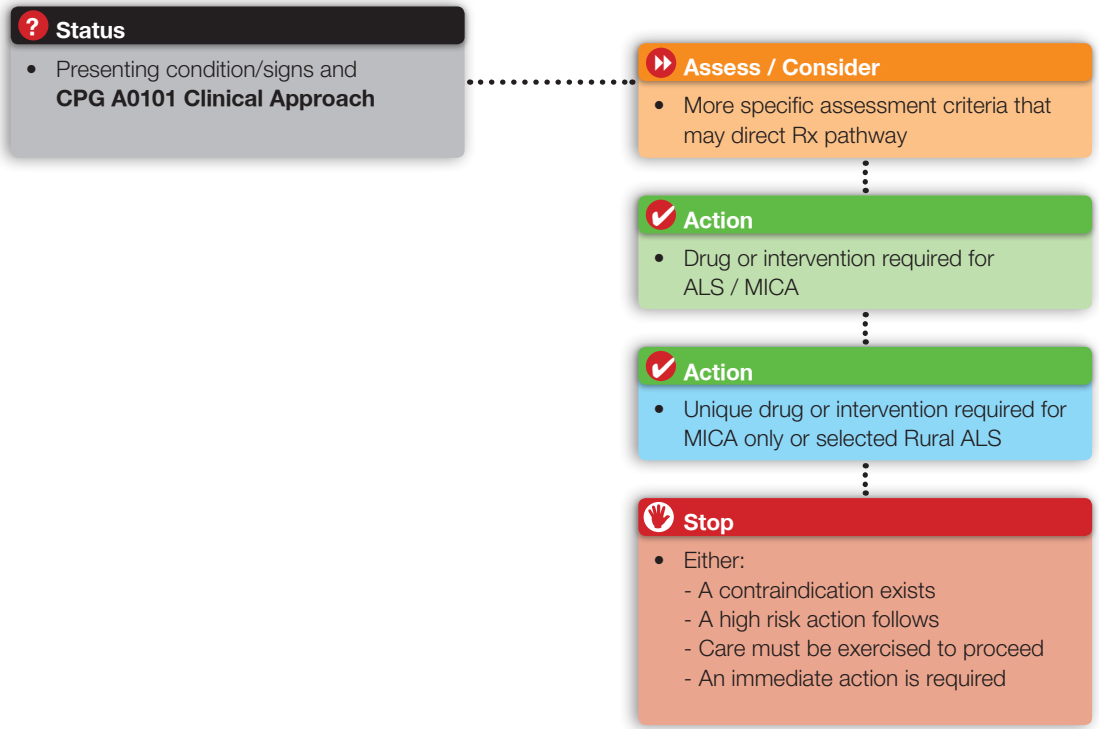
## Special Notes

- Information to support these CPGs and improve the user's understanding of a concept.

## General Care

- Provides supporting information or care related to the CPGs. e.g. Infusion preparations.

# Graphic Guide

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# Oxygen Therapy

# CPG A0001

## Introduction

- This CPG should only be applied to patients aged ≥ 12 years.

## Mx principles

- $O_2$ is a treatment for hypoxaemia, not breathlessness. $O_2$ has not been shown to have any effec on the sensation of breathlessness in non-hypoxaemic patients.
- Treatment is aimed at achieving normal or near normal $SpO_2$ in acutely ill patients. $O_2$ should be administered to achieve a target $SpO_2$ while continuously monitoring the patient for any changes in condition.
- $O_2$ should not be administered routinely to patients with normal $SpO_2$. This includes those with stroke, ACS and arrhythmias.
- In patients who are acutely short of breath, the administration of $O_2$ should be prioritised before obtaining an $O_2$ saturation reading. $O_2$ can later be titrated to reach a desired target saturation range.
- If pulse oximetry is not available or unreliable, provide an initial $O_2$ dose of 2 - 6 L/min via nasal cannulae or 5 - 10 L/min via face mask until a reliable $SpO_2$ reading can be obtained or symptoms resolve.

## Special circumstances

- Early aggressive $O_2$ administration may benefi 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 firs instance, $O_2$ should be administered with the aim of achieving an $SpO_2$ of 100%. Once the patient is haemodynamically stable, the $O_2$ 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 $O_2$ administration. Once the patient is haemodynamically stable, the $O_2$ 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.

Key reference: Beasley, R., Chien, J., Douglas, J., Eastlake, L., Farah, C., King, G., Moore, R., Pilcher, J., Richards, M., Smith, S. and Walters, H. (2015), Thoracic Society of Australia and New Zealand oxygen guidelines for acute oxygen use in adults: 'Swimming between the flags' Respirology, 20:1182–1191

# Oxygen Therapy



## Special 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 $SpO_2$ reading below 80% increases the chance of being inaccurate.
- All patients suspected of having inhaled potentially toxic gases (e.g. house fi es, carbon monoxide poisoning, etc.) should be given high dose $O_2$ until arrival at hospital. In these clinical situations, patients who show no signs of breathlessness may still benefi from this treatment.
- Where the patient may have been exposed to other poisons, administer $O_2$ to maintain an $SpO_2$ of 92- 96%. Poisons information can be contacted via the clinician on **13 11 26**.
- Special circumstances occur in the setting of paraquat and bleomycin poisoning where the use of $O_2$ therapy may prove detrimental to the patient. The maintenance of prophylactic hypoxaemia in these patients ($SpO_2$ of 85 - 88%) is recommended.
- Patients with medically diagnosed pneumothorax, but without an intercostal catheter in situ, may benefi from high dose $O_2$ regardless of $SpO_2$.

## General Care

- Irrespective of $SpO_2$, patient tidal volume should be assessed to ensure ventilation is adequate.
- $O_2$ exchange is at its greatest in the upright position. Unless other clinical problems determine otherwise, the upright position is the preferred position when administering $O_2$.
- Ensure the patient's fingertip are clean of soil or nail polish. Both may affec 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). $O_2$ is not required however no attempt should be made to retain $CO_2$ (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 flo rates < 5 L/min due to the risk of $CO_2$ retention.
- Nasal cannulae are likely to be just as effectiv with mouth-breathers. However, where nasal passages are congested or blocked, face masks should be used to deliver $O_2$ therapy.

# Oxygen Therapy

# CPG A0001

**Status**
- Evidence of hypoxaemia
- Breathlessness

**Assess / Consider**
- Acute or chronic?
- Respiratory Status
- Assess and monitor $SpO_2$ continuously
- Consider causes of hypoxaemia
- Bleomycin and paraquat poisoning - see special note

**Adequate $SpO_2$**
- $SpO_2 \geq 92\%$

**Action**
- No $O_2$ required
- Reassure Patient

**Mild-moderate hypoxaemia**
- $SpO_2$ 85 – 91%

**Action**
- Titrate $O_2$ flow to Sp $_2$ of 92 – 96%
  - Initial dose of 2 – 6 L/min via nasal cannulae
  - Consider simple face mask 5 – 10 L/min

**Severe hypoxaemia**
- $SpO_2 < 85\%$

OR

**Critical illnesses**
- Cardiac arrest or resuscitation
- Major trauma/head injury
- Shock
- Severe sepsis
- Anaphylaxis
- Status epilepticus
- Ketamine sedation

**Action**
- Initial Mx:
  - Initial dose nonrebreather mask 10-15 L/min
  - If inadequate VT , consider BVM ventilation with 100% $O_2$
- Once Pt haemodynamically stable and has reliable oximetry reading
  - Titrate $O_2$ flow to Sp $_2$ of 92 – 96%
- If Pt deteriorates or $SpO_2$ remains < 85%
  - BVM ventilation with 100% $O_2$
  - Consider SGA as per **CPG A0301 Supra-Glottic Airway**
  - Consider ETT as per **CPG A0302 Endotracheal Intubation**

**Chronic hypoxaemia**
- COPD
- Neuromuscular disorders
- Cystic Fibrosis
- Bronchiectasis
- Severe kyphoscoliosis
- Obesity

**Stop**
- High-concentration $O_2$ may be harmful in the COPD Pt at risk of hypercapnic respiratory failure

**Action**
- Titrate $O_2$ flow to Sp $_2$ of 88 – 92%
  If no critical illness present
  - Initial dose of 2 – 6 L/min via nasal cannulae
  - Consider simple face mask 5 – 10 L/min
- If Pt deteriorates or $SpO_2$ remains < 85%
  - Rx as per Severe hypoxaemia

**Regardless of $SpO_2$**
- Toxic inhalation exposure
- Decompression Illness
- Cord prolapse
- Postpartum haemorrhage
- Shoulder dystocia
- Cluster headache

**Action**
- $O_2$ via nonrebreather mask 10 – 15 L/min



Status | Stop | Assess | Consider | Action | MICA Action

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# Clinical Approach

# CPG A0101

## Special Notes

- The dynamic risk assessment should be part of every case, however it is highlighted as part of the clinical approach to reinforce to Paramedics that AV does not expect Paramedics to put themselves at risk of injury during manual handling or any other procedure.
- The intent of the "Does the patient look unwell?" question is to rapidly determine whether the formal primary survey is required. If unsure, the default position is to assume the patient is unwell.
- The Pause and Plan moment provides an opportunity for Paramedics on scene to discuss their clinical hypothesis of the patient problem, along with the plan for managing it. Ideally these discussions should be openly held in front of the patient to allow their input.
- During the Pause and Plan moment, after agreement on the main presenting problem is reached it is reasonable for Paramedics to consider and discuss what other likely diagnoses are possible. This can help to prevent a human factors error of focusing on one diagnosis to the exclusion of all others, particularly if the patient does not respond to the treatment plan as expected.
- Frailty does not necessarily correlate with advanced age. It is a complex syndrome with multiple contributing factors including age, baseline health, strength and endurance. Frail patients are more vulnerable to the complications of ill-health and CPGs may recommend adjusted treatment plans (including reduced medication doses) where appropriate.
- **A patient treated with the intention of referral away from ED should be reassessed prior to departure from the scene. If the patient has not responded to treatment as expected, then revise the care plan and transport them to ED.**

## General Care

- The Clinical Approach represents the minimum standard of assessment Paramedics should provide for a patient. If it cannot be achieved or is deemed clinically not necessary, the rationale should be documented by the treating crew.
- The minimum standard of care for patients being transported by AV is 15 minutely vital signs assessments, to allow monitoring of trends and early identification of the deteriorating patient. If this isn't possible or is deemed clinically unnecessary the rationale should be documented. If the patient is considered unwell or deteriorates, vital signs should be monitored more frequently.
- The primary survey is often not formally necessary when patients are obviously conscious, alert and conversant. For more unwell patients it is the starting point of a systematic assessment designed to identify clinical issues in order of urgency. If a patient deteriorates during a case, the default position should be to return to the primary survey and reassess.
- Within the primary survey, exposure reflects both the need to expose the patient to assess them (whilst maintaining patient dignity), and also acts as a reminder of the risk of hypothermia once the patient is exposed.
- For the majority of patients, it will be appropriate to establish a rapport and collect a verbal history prior to any hands-on assessment. This should not lead to excessive delays in collecting vital signs.
- When the patient is first assessed, consideration should be given to not only how the patient presents at that time, but also where the patient is placed on their clinical trajectory. For example, a patient suffering an asthma attack after having a chest infection for 3 days is in a different place on the clinical spectrum than a patient having an acute exercise-induced asthma attack, although their VSS may be the same.

# Clinical Approach

# CPG A0101

**Conduct a dynamic risk assessment throughout each case, particularly prior to manual handling being undertaken**

## ARRIVE

**ARRIVE - STOP**

- **D** - Dangers
- Utilise standard precautions, PPE and personal safety awareness
- Utilise dynamic risk assessment

## ASSESS

**Assess**

**RAPID ASSESSMENT**
Does the patient look unwell? (For paediatric patients, use the Paediatric Assessment Triangle)
Do I need backup?

**APPEARS UNWELL**

**RAPID ASSESSMENT**
Apply primary survey:

- **R**esponse (Yes/No)
- **A**irway (consider cervical spine)
- **B**reathing
- **C**irculation (including haemorrhage check)
- **D**isability (AVPU)
- **E**xposure

**APPEARS WELL**

Move on to "Action", establishing rapport prior to beginning assessment. If it instinctively feels like the patient isn't clinically well enough for you to establish rapport prior to beginning assessment, move to the "appears unwell" pathway.

**"Unwell" patients include unconscious, altered conscious, obvious SOB or obvious pale/sweaty. Identify immediate life threatening problems and correct before continuing the Primary Survey. Provide Sitrep if required using ETHANE format**

## ACTION

**Action**

- Rapport, rest and reassurance
- Position appropriately
- $O_2$ if required as per **CPG A0001 Oxygen Therapy**
- Establish if refusal or limitation of treatment documented

# Clinical Approach CPG A0101

## ASSESS

**ASSESS – use clinical judgement to determine order of relevance**

**Ask about:**
- Hx of presenting complaint
- Past medical Hx
- Medications
- Allergies
- Other information: bystanders, health professionals, Poisons Information, etc.

**Apply assessment tools as appropriate:**
- VSS
- PSA
- RSA
- GCS
- Trauma time critical guidelines
- Medical time critical conditions
- Trauma secondary survey
- Utilise other assessment tools, e.g. DOLOR, AEIOUTIPS, MASS

**Apply assessment equipment as appropriate:**
- $SpO_2$
- Temperature
- $EtCO_2$
- ECG (12-lead if available)
- BGL

## ACTION

**ACTION – Pause and Plan**

**Pause and Plan:**
- Verbally identify clinical problems
- Consider frailty status
- Consider clinical risk factors as per **CPG A0108 Clinical Flags**
- Verbally confirm treatment plan with team
- Consider support options: MICA, AAV, the Clinician, ARV, ED consult
- Consider time to hospital vs. time to MICA

**OR**

**ACTION – Treatment and Transport**
- Mx as per appropriate CPG/s
- Tx to appropriate facility if required (consider alternate transport options where appropriate)
- Reassess whilst in AV care - 15 minutely as a standard unless clinical rationale provided

MICA Mx as per appropriate CPG/s

**ACTION – Treat and Refer**

If patient is being managed with a Treat and Refer CPG:
- Ensure patient is low acuity, with an isolated simple problem covered by a Treat and Refer care-plan
- Ensure patient consents to the Treat and Refer plan
- Ensure patient understands the post referral instructions and has the resources to follow them



Status | Stop | Assess | Consider | Action | MICA Action

# Perfusion Assessment

# CPG A0102

## Special Notes

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.

## Special Notes

# Perfusion Assessment

# CPG A0102

**Perfusion status assessment**

| | Skin | Pulse | BP | Conscious state |
|---|---|---|---|---|
| **Adequate perfusion** | Warm, pink, dry | 60 – 100 bpm | > 100 mmHg systolic | Alert and orientated to time and place |
| **Borderline perfusion** | Cool, pale, clammy | 50 – 100 bpm | 80 – 100 mmHg systolic | Alert and orientated to time and place |
| **Inadequate perfusion** | Cool, pale, clammy | < 50 bpm or > 100 bpm | 60 – 80 mmHg systolic | Either alert and orientated to time and place **or** altered |
| **Extremely poor perfusion** | Cool, pale, clammy | < 50 bpm or > 110 bpm | < 60 mmHg systolic or unrecordable | Altered or unconscious |
| **No perfusion** | Cool, pale, clammy | No palpable pulse | Unrecordable | Unconscious |

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# Respiratory Assessment



**Respiratory status assessment**

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

# Conscious State Assessment

# CPG A0104

## Glasgow Coma Scale

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

The principal 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.

## 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.

# Conscious State Assessment

# CPG A0104

## Glasgow Coma Scale

| Eye opening | Score |
|---|---|
| Spontaneous | 4 |
| To voice | 3 |
| To pain | 2 |
| None | 1 |
| **Verbal response** | **Score** |
| Orientated | 5 |
| Confused | 4 |
| Inappropriate words | 3 |
| Incomprehensible sounds | 2 |
| None | 1 |
| **Motor response** | **Score** |
| Obeys command | 6 |
| Localises to pain | 5 |
| Withdraws from pain | 4 |
| Abnormal flexion to pain | 3 |
| Adnormal extension to pain | 2 |
| None | 1 |

**Total score = E+V+M**

## AVPU (Alert, Voice, Pain, Unresponsive)

| Pt response |
|---|

When assessed, is the Pt:

A = alert

V = responds to voice

P = responds to pain

U = unresponsive

# Time Critical Guidelines

# CPG A0105

## Introduction

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

| | |
|---|---|
| **Actual** | At the time the vital signs survey is taken, the patient is in actual physiological distress. |
| **Emergent** | 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. |
| **Potential** | 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. |

### 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.

**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.

# Time Critical Guidelines (Trauma Triage)

# CPG A0105

**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 <60 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**

# Time Critical Guidelines (Trauma Triage) CPG A0105

**Assess patient against high risk criteria for major trauma**

No

**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/tibia/humerus
- Fractured pelvis

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

Yes

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

**High Risk Criteria for Major Trauma**

**Assess for mechanism of injury:**
- Motor / cyclist impact > 30kph
- High speed MCA > 60kph
- Pedestrian impact
- Ejection from vehicle
- Prolonged extrication
- Fall from height > 3m
- Struck on head by object falling > 3m
- Explosion

**And co-morbidities:**
- Age < 12 or > 55, OR
- Pregnant, OR
- Significant underlying medical condition

**Does the patient meet the high risk criteria (mechanism AND comorbidity)?**

No

**Transport to the nearest appropriate emergency care facility**

Yes

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

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# Mental Status Assessment

# CPG A0106

## Special Notes

- 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.

## General Care

- 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 over-represented 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.

# Mental Status Assessment



| LOOK FOR, LISTEN TO & ASK ABOUT ALL CATEGORIES BELOW<br>*THE PATIENT MAY BE SUFFERING FROM SOME OF THE FOLLOWING EXAMPLES*<br>**Remember verbal de-escalation strategies, active listening and calm/open body language** | | |
|---|---|---|
| OBSERVE | **Safety** | 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. |
| | **Appearance** | 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. |
| | **Behaviour** | Patient may display; odd mannerisms, impaired gait, avoidance or overuse of eye contact, threatening or violent behaviour, unusual motor activity or activity level (i.e. wired or buzzing), bizarre/inappropriate responses to stimuli, pacing. |
| | **Affect** | Observed to be; flat, depressed, agitated, excited, hostile, argumentative, violent, irritable, morose, reactive, unbalanced, bizarre, withdrawn etc. |
| LISTEN | **Speech** | Take note of: rate, volume, quantity, tone, content, overly talkative, difficult to engage, tangential, flat, inflections etc. |
| | **Thought Process** | May be altered, can be perceived by patient jumping irrationally between thoughts, sounding vague, unsteady thought flow when communicating verbally. |
| | **Cognition** | May be exhibiting signs of impairment such as; poor ability to organise thoughts, short attention span, poor memory, disorientation, impaired judgement, lack of insight. |
| DISCUSS | **Thought Content** | May be dominated by; delusions, obsessions, preoccupations, phobias, suicidal/depressed or homicidal thoughts, compulsions, superstitions. |
| | **Self-Harm** | Ask patient directly if they have attempted self-harm, suicide or are thinking/planning for these. Ask about previous attempts. |
| | **Perceptions** | 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'. |
| | **Environment** | 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). |

# Mental Health Conditions

# CPG A0107

**Status**

High index of suspicion that patient is suffering from Mental Health Issue

**Stop**

- Assess scene for dangers
- Ensure safe environment for Paramedics, patient and bystanders
- Continually and dynamically reassess scene for changes in patient/bystander behaviour i.e. increasing aggression/ violence
- Consider application of **CPG A0708 Agitation/Delirium**

**If Danger Present**

- Withdraw from scene to a safe distance
- Inform communications staff of situation, and request police assistance
- Only re-approach patient/scene once escorted or instructed by police.
- Any violent or extremely agitated behaviour is immediately considered 'High Risk', requiring patient transport.

**No Apparent Mental Health Issue**

**Action**

- Continue with patient assessment
- Apply relevant CPG as required

**Mental Health Issue Present**

Complete Mental Status Assessment CPG A0106

**Assess/Consider**

- Assess and Mx Clinical/organic causes (as far as possible). See AEIOUTIPS in **CPG A0708 – Agitation/ Delirium.**

**Does the Pt have "High - Risk" symptoms?**

**Assess**

Patient is considered to be "high-risk" if any of the following are present:

- Suicidal ideation (attempt, thoughts, intent or plan)
- Self-harming behaviours or actions
- Intentional overdose/poisoning
- Cognitive impairment (except if normal for patient)
- Erroneous or altered perceptions e.g. delusions, hallucinations or evidence of other thought disorder(s)

**Yes**

**Transport Pt to Hospital**

**Action**

- Ascertain patient's home address and which mental health catchment they belong to (via AV clinician or VACIS).
- Transport patient to appropriate and/or nearest available hospital.

**No**

**Are there signs that the Pt requires immediate support?**

**Assess**

- Patient lacks any readily available social/emotional support options
- Evidence of not coping. Can be visualised from environmental cues or verbalised by patient e.g. 'I'm at my wit's end'/ 'I can't do this anymore'.
- Patient is perceived to be in a dangerous social situation e.g. potential domestic abuse.

**Create Support Action Plan for Pt**

**Action**

- Contact patient's own mental health practitioner **OR**
- Contact patient's GP for appointment to discuss Mental Health Plan/Assessment **OR**
- Contact CAT team or the crisis triage number relevant to patient's home address and mental health catchment **OR**
- Contact Pt's family member or friend to support Pt at this time. Wait on scene for their arrival.

If these options are not suitable or are unsuccessful, transport Pt to an appropriate hospital.

# Clinical Flags

# CPG A0108

## Special Notes

**Care objectives**

- To transport patients when they require medical review.
- To reduce adverse outcomes from non-transport decisions.

- The Clinical Red Flags mandate transport. Where paramedics believe transport is not required, they must contact the AV Clinician.
- The red flag vital signs and specific conditions listed requiring transport are not an exhaustive collection. 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 flag vital signs or specific or conditions within this CPG, but staff have a non-specific concern ("gut instinct") about their health or welfare, it is valid to act upon this concern.
- The yellow flags do not mandate transport, but they highlight circumstances that increase the risk of a non-transport decision. When weighing the risk to a patient, they should be considered a cumulative tool – the more flags that relate to a patient, the higher the risk they are exposed to.

## General Care

- All patients deserve a full and thorough assessment. Personal biases can interfere with carrying out an assessment, and the interpretation of information collected. No individual is immune to personal bias, but recognising and acknowledging that a bias is present can help to mitigate the impact of that bias on subsequent decisions.
- Some patients will meet the vital signs medical criteria at initial presentation, however will respond well to treatment, such as heroin overdose or hypoglycaemia. It is reasonable to treat these patients and re-assess, 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.
- The vital signs contained in this CPG apply to the adult patient. Paediatrics should be assessed against their normal range. If a paediatric patient has vital signs outside their normal range transport is required.
- This guideline is not an indicator of a requirement for MICA.
- 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.

# Clinical Flags

# CPG A0108

## Clinical Red Flags

**Does the patient have any single vital sign meeting the following criteria?**

- HR > 120 per minute
- RR > 30 per minute
- Systolic BP < 90 mmHg
- $SpO_2$ < 90% (unless chronic hypoxaemia as per **CPG A0001 Oxygen Therapy**)
- GCS <13 (< 15 if age ≤15 years)

**OR**

**Does the patient have any of the following specific conditions?**

- First presentation seizure
- Anaphylaxis (even if resolved following treatment)
- Acute coronary syndrome (even if symptoms resolved)
- Ectopic pregnancy
- Primary obstetric issue
- Stroke/TIA
- Sudden onset headache

**Yes**

**Transport to the closest appropriate hospital. Consider notification.**

**No**

**Assess patient against yellow flags.**

**A patient who meets any of the Clinical Red Flags in this CPG MUST be transported to hospital. Where the patient refuses transport, or paramedics believe transport is not warranted, the AV Clinician must be contacted.**

## Clinical Yellow Flags

**Consider the following factors when assessing the patient:**

- Age < 5 years
- Frailty (incl. age, comorbidities and baseline functioning)
- Communication difficulties, e.g. NESB, intellectual disability, dementia
- Current drug or alcohol intoxication
- History of mental health problems
- Multiple comorbidities / complex medical history / ≥ 5 medications
- Past history of falls, stroke, TIA or AF
- Recent medical or surgical procedures
- Significant unexplained pain (e.g. ≥ 5)

**Consider the following scene safety factors before making a non-transport decision:**

- Risks to the safety of the patient
- Adequate shelter and warmth
- The supply of required medications
- Ability to access further help if required

**Is the patient at risk if not transported?**

**Yes**

**Consider transport to the closest appropriate hospital.**
**If a non-transport decision is made the patient must be:**

- Left with a responsible 3rd party (where available)
- Informed of the risks and possible consequences of deterioration
- Given clear instructions when to call back
- Advised to follow up with an appropriate healthcare provider

**No**

**Routine care as per AV CPGs.**

# Clinical Frailty Scale

CPG A0109

**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**

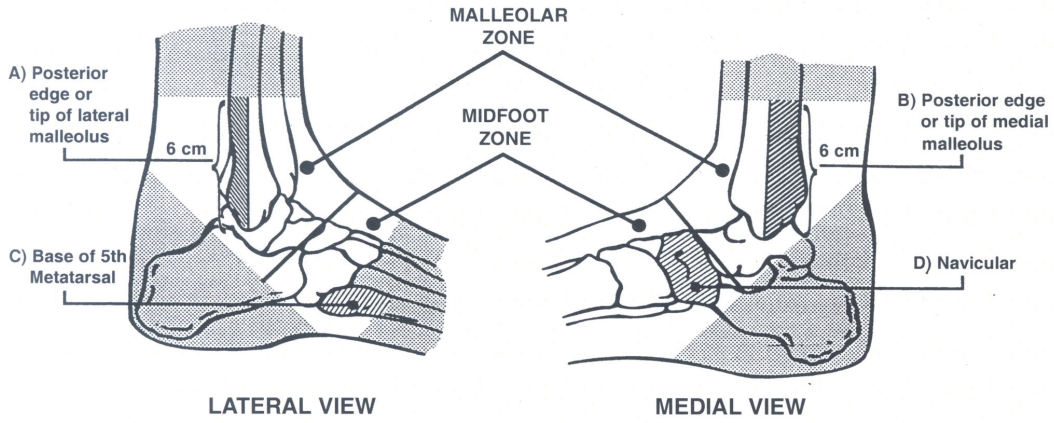
The degree of frailty corresponds to the degree of dementia. Common **symptoms in mild dementia** include forgetting the details of a recent event, though still remembering the event itself, repeating the same question/story and social withdrawal.

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.

# Ottawa Ankle Rules

## CPG A0110




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 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 both immediately and in ED

## RECOMMENDATIONS

**Apply the Ottawa Ankle Rules accurately:**

- palpate the entire distal 6 cm 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**

*Stiell IG, McKnight RD, Greenberg GH, et al. Implementation of the Ottawa Ankle Rules. JAMA 1994; 271:827-832.*

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# Cardiac Arrest

# CPG A0201

## Traumatic Cardiac Arrest

### 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
- **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.

## Ratios 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

### 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

- **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 $EtCO_2$
- 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
- **$EtCO_2$** can be used as a surrogate marker of cardiac output and may approach physiological values with high quality CPR
- A gradual fall in $EtCO_2$ 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 communitcation
  - 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**

# Cardiac Arrest



## Special Notes

**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 |

## Special Notes

**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, 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 or hyperkalaemia**
  - Administer **Sodium bicarbonate 8.4% 100 mL 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 A0702 Hypoglycaemia**
  - All other management to be prioritised above BGL measurement

# Cardiac Arrest - Medical

# CPG A0201

## Medical cardiac arrest

- Unconscious and pulseless **OR** unsure of the presence of a pulse in the setting of gasping or agonal respirations
- Hx, MOI or injuries do not suggest traumatic cause of cardiac arrest

### Action

- Immediately commence **High-Performance CPR**
- On-screen analysis in **manual mode** at 2-minute intervals
- Charge defibrillator during chest compressions
- Pulse checks **only** for potentially perfusing rhythms

## VF / Pulseless VT

**Prioritise High-Performance CPR and timely defibrillation**

### Action

- **Defibrillate 200 J**
- Immediately recommence chest compressions

- **Amiodarone 300 mg IV / IO** if VF / VT after 3rd shock
- **Amiodarone 150 mg IV / IO** If VF / VT persists after 5th shock

## Asystole / PEA

**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

- **Supra-Glottic airway** (CPR ratio 15:1 post-insertion)
- IV access/**Normal Saline TKVO**
- **Adrenaline 1 mg IV** repeat every 2nd cycle (4-minutely)
- Flush all medications with 20 - 30 mL Normal Saline
- Where time permits $ETCO_2$ monitoring & insert OG tube through SGA

- **Adrenaline 1 mg IV/IO** repeat every 2nd cycle (4-minutely)
- **ETT** where placement can be achieved with **NO** additional pause in compressions
  - Early ETT if copious vomitus or Supra-Glottic airway failure

# Cardiac Arrest - Trauma

# CPG A0201

**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

# Cardiac Arrest (ROSC Management)

# CPG A0202

## Special Notes

**CPG A0302 Endotracheal Intubation**
**CPG A0407 Inadequate Perfusion (Cardiogenic Causes)**
**CPG A0408 STEMI Management**
**CPG A0702 Hypoglycaemia**

## General Care

- 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**.

# Cardiac Arrest (ROSC Management)

# CPG A0202

**Status**

- Post cardiac arrest
  - Return of spontaneous circulation (ROSC)

**Unintubated**

- GCS < 10 post ROSC

**Action**

- Collapse to ROSC > 10 minutes:
  - RSI as per **CPG A0302 Endotracheal Intubation**
- Collapse to ROSC < 10 minutes:
  - RSI as per **CPG A0302 Endotracheal Intubation** if coma persists despite initial oxygenation and perfusion Mx
- Target $ETCO_2$ 30 – 40 mmHg

**Perfusion Mx**

**Action**

- Titrate **Adrenaline** and **Normal Saline** as per **CPG A0407 Inadequate Perfusion: Cardiogenic causes**
  - Target SBP 100 mmHg
  - Max total **Normal Saline 20 mL/kg** during arrest and post ROSC
  - Max **Adrenaline** infusion rate **250 mcg/min**
- Accurately assess pulse during moving/loading to ensure output maintained throughout
- Mx as per appropriate CPG if condition changes

**Stop**

- Do not administer **Amiodarone** unless breakthrough VF/VT occurs

**Consider PHT**

**Action**

- 12 lead ECG
- Consider PHT as per **CPG A0408 STEMI management**

**Transport**

**Action**

- VF/VT arrest OR suspected cardiac cause OR post PHT:
  - Transport to 24 hour PCI facility where available
  - Consider AAV vs time to closest hospital
- Suspected non-cardiac cause:
  - Transport to the closest appropriate hospital with notification

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# Withholding or Ceasing Resuscitation CPG A0203

## Special Notes

- 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 f om 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 esponder) 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.

## Advance Care Directive

- 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 patients Advance Care Directive must be followed even where the emergency is not directly related to a pre-existing 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.
- For more information, visit: http://www.health.vic.gov.au/acp/

## 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 / remote area nurses) 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.
- 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.

# Withholding or Ceasing Resuscitation

# CPG A0203

**Stop**

Do not attempt Mx if there is risk to Paramedic safety

**Status**

Pulseless and Apnoeic after opening airway

## 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

**OR**

**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 an consider Verification of Death for

## No prospect of resuscitation

**Prolonged cardiac arrest**

- Asystole is the presenting rhythm

**AND**

- Estimated time from collapse to AV/First Responder attendance > 10mins

**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 for

# Withholding or Ceasing Resuscitation CPG A0203

## 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.

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# Supra-Glottic Airway (SGA)

# CPG A0301

## Special Notes

- 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 orogastric tube may provide benefit in decompressing the stomach and allowing drainage of gastric contents.
- In the setting of cardiac arrest, insertion of an orogastric 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.

## General Care

- 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.
- Sedation to maintain an SGA is not recommended as routine care. It may be done cautiously as per "Care and Mx of intubated Pt" in **CPG A0302 Endotracheal intubation** if an SGA has been inserted as a rescue airway device under **CPG A0303 Difficult airway guideline**, in circumstances where:
  - The patient's conscious state improves to the point where maintaining the SGA in situ is difficult, **AND**
  - Removal of the SGA may lead to the loss of the airway again.
- Sedation to maintain an SGA is contraindicated in patients with airway burns due to the risk of worsening airway oedema. If intubation is not possible, a surgical airway is required.
- Consider the distance to hospital and the ability to oxygenate and ventilate the patient without the SGA in situ prior to sedating the patient in order to maintain the SGA.
- If a patient is sedated to maintain the SGA, the use of neuromuscular blockage or mechanical ventilation is contraindicated.

# Supra-Glottic Airway (SGA)

# CPG A0301

## 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

| i-gel size | Pt weight guide* | Max size of gastric tube |
|---|---|---|
| 1.0 | 2 – 5 kg | N/A |
| 1.5 | 5 – 12 kg | 10 |
| 2.0 | 10 – 25 kg | 12 |
| 2.5 | 25 – 35 kg | 12 |
| 3.0 | 30 – 60 kg | 12 |
| 4.0 | 50 – 90 kg | 12 |
| 5.0 | 90+ kg | 14 |

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

# Endotracheal Intubation Guide

# CPG A0302

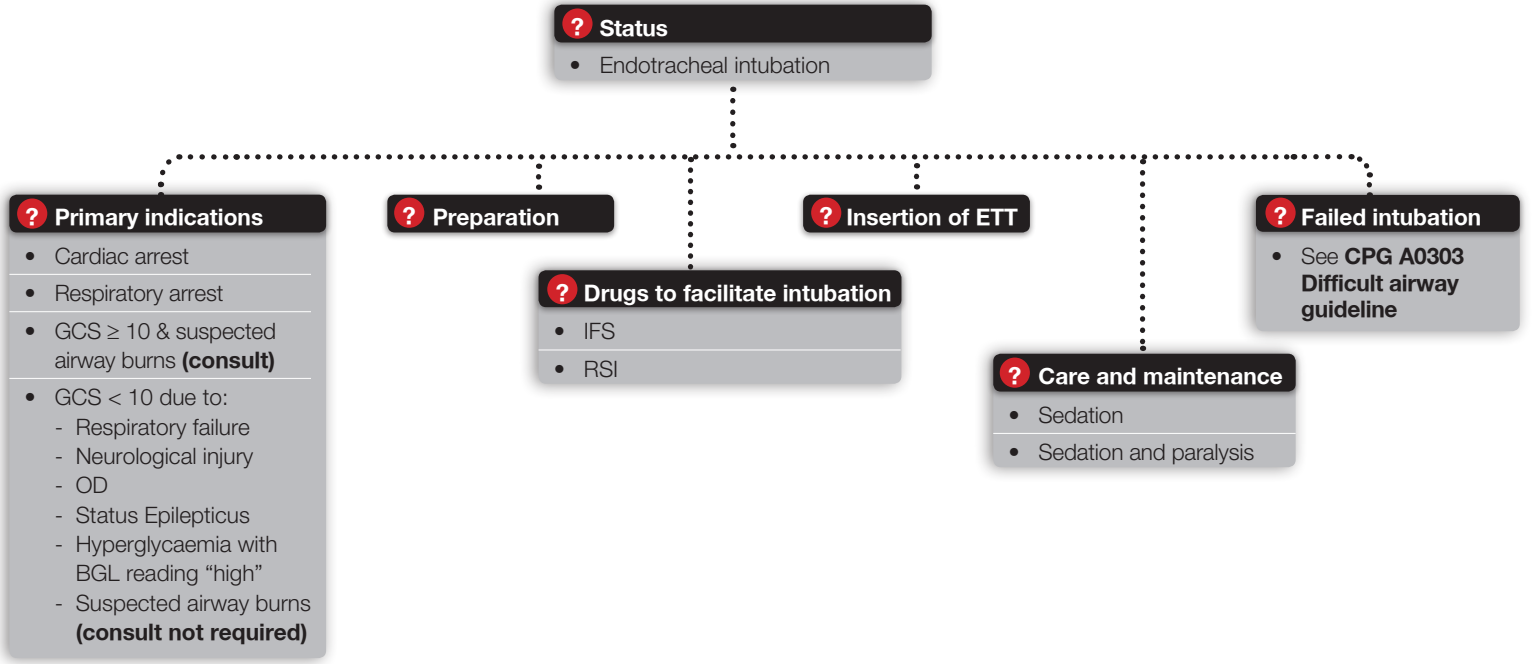
## Special Notes

- The Medical Advisory Committee has authorised endotracheal intubation by MICA Paramedics in selected clinical situations.
- There are three intubation techniques available:
  - Unassisted endotracheal intubation
  - Intubation Facilitated by Sedation (IFS)
  - Rapid Sequence Intubation (RSI)

  The appropriate technique will vary according to the clinical setting and the scope of practice of the attending MICA Paramedic(s).
- A MICA Paramedic operating alone may elect not to perform a drug-facilitated intubation until a second MICA Paramedic is present.
- All intubations facilitated or maintained with drug therapy will be reviewed as part of AV's clinical governance processes.
- The use of cricothyroidotomy is restricted to MICA Paramedics specifically credentialled in this skill as required by the Medical Advisory Committee.

# Endotracheal Intubation Guide

# CPG A0302



# Endotracheal Intubation Indications, Precautions, C/Is



## Special Notes

- **Traumatic brain injury**
  - RSI should be provided unless patient is in cardiac arrest. This includes patients with absent airway reflexes.
  - **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.
- **Status epilepticus**
  - Status epilepticus refers to either ≥ 5 minutes of continuous seizure activity OR multiple seizures without full recovery of normal conscious state between seizures. These patients may require intubation if there is airway / ventilation compromise which is unable to be managed using BVM and OPA / NPA.
- **Suspected TCA OD**
  - Requiring hyperventilation for cardiac arrhythmia prevention or management.
- **Overdose**
  - The intent of the OD indication for RSI in the context of a difficult extrication is that the patient be intubated at the scene to enable safer movement of the patient.
- **Gag reflex during CPR**
  - Treat as per CPR Interfering Patient in **CPG A0201 Cardiac Arrest**.

## Special Notes

- **Uncontrolled bleeding**
  - In patients with uncontrolled bleeding (e.g. ruptured ectopic pregnancy, penetrating truncal trauma, limb avulsion) ongoing bleeding may lead to poor cerebral perfusion and coma.
  - RSI in these patients is potentially harmful. The sedation may drop BP further and the added scene time increases total blood loss. The appropriate treatment for these patients is urgent transport and immediate surgery.
  - RSI should **NOT** be undertaken in patients who become unconscious when the coma is likely to be secondary to blood loss unless RSI is judged to be absolutely essential due to an unmanageably combative patient or it is impractical to transport unintubated. This applies to both air and road transport.
  - Airway management with BVM is to be maintained in conjunction with prompt transport. Intubation (without drugs) should be considered if airway reflexes are lost, bearing in mind the risks of delay to definitive surgical care.
- **Severe hyperthermia**
  - May result from drug OD, exertion (e.g. marathon running) or environmental exposure. If after 10 minutes of active cooling patient temp remains > 39.5°C and GCS < 10, then patient should be intubated via RSI.
- **Severe hypothermia**
  - Where possible intubation should be avoided in hypothermic patients, due to the risk of provoking arrhythmias.
- **Severe pain**
  - Severe pain patients are those who are unable to be humanely managed with analgesia alone. Examples include mangled limb injuries, significant %TBSA burns, or patients trapped in machinery/plant.

# Endotracheal Intubation Indications, Precautions, C/Is

**CPG A0302**

## Unassisted Endotracheal Intubation

### Indication

- Respiratory arrest
- Cardiac arrest
- Absent airway reflexes

### General precautions

- Time to intubation at hospital vs time to intubate at the scene
- Poor baseline neurological functioning and major co-morbidities
- Advanced Care Plan / Refusal of Medical Treatment document specifies "not for intubation"
- In general, severe hypothermia Pts should receive basic airway Mx and be transported for rewarming.

## IFS

### Indication GCS < 10

- Hyperglycaemia with BGL reading "high"
- Frail or elderly respiratory failure
  - e.g. COPD or APO
- Pts with GCS < 10 and requiring intubation, but contraindicated for **Suxamethonium** and AAV support is unavailable.

### Specific precautions for IFS

- As per general precautions, and
- Anticipation of difficulty with BVM ventilation
- Anticipation of a difficult intubation, e.g. obesity, short neck or facial trauma
- In general if Tx time < 10 minutes, IFS should not be undertaken

### Contraindications

- Clinical situations where difficult airway guideline is not possible
- No functional electronic capnograph
- Traumatic brain injury

## RSI

### Indication

- GCS < 10 with
  - Traumatic Brain Injury (TBI)
  - Non-traumatic brain injury
    - CVA or sub-arachnoid haemorrhage
  - Hypoxic brain injury
    - Post hanging, near drowning or ROSC
  - Respiratory failure unless frail or elderly
    - Young asthmatic
  - Suspected airway burns
  - OD with any of:
    - Suspected TCA OD
    - Difficult extrication
    - Prolonged Tx time (> 30 minutes)
    - SpO2 unable to be maintained > 90%
  - Severe hyperthermia
    - >39.5°C despite 10 minutes of active cooling
  - Status epilepticus
- Severe pain that is unable to be managed using analgesic agents, irrespective of GCS
- GCS ≥ 10 with suspected airway burns **(consult)**

### Specific precautions for RSI

- As per general precautions, and
- In general if Tx time < 10 minutes, RSI should not be undertaken

### Contraindications CIs

- Clinical situations where the difficult airway guideline is not possible
- No functional electronic capnograph
- Any C/I to **Suxamethonium**
- Coma due to uncontrolled bleeding, eg. penetrating trauma or suspected ruptured aortic aneurysm

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# Endotracheal Intubation Preparation



## Unassisted Endotracheal Intubation

**? General preparation for intubation**

**✔ Action**

- Position Pt. If a cervical collar is fitted it should be opened while maintaining manual cervical support
- Pre-oxygenate with high-flow $O_2$ via nasal prongs, 100% $O_2$ via BVM with 5 cm $H_2O$ PEEP valve and electronic capnograph attached
- Ensure pulse oximeter and cardiac monitor are functional
- Prepare equipment and assistance
  - Suction
  - ETT (plus one size smaller than predicted immediately available) with introducer
  - Ensure equipment for difficult airway is immediately available including bougie, LMA and cricothyroidotomy kit
  - Mark cricothyroid membrane as necessary
  - Brief assistant to provide cricoid pressure if required
  - If suspected spinal injury, where possible a second assistant should be available to stabilise the head and neck
- Ensure functional and secure IV access

## IFS

**? Preparation for IFS**

**✔ Action**

- As per General preparation
- Pre-hydrate with **Normal Saline 10 mL/kg IV** bolus unless APO
- If Pt hypotensive and/or tachycardic, follow relevant CPG in conjunction with the intubation process
- Draw up and label drugs as appropriate

## RSI

**? Preparation for RSI**

**✔ Action**

- As per General preparation
- Prehydrate with **Normal Saline 10 mL/kg IV** bolus
- If Pt hypotensive and/or tachycardic, follow relevant CPG in conjunction with intubation process

**Adrenaline must not be administered to TBI patients without consultation with a MTS**

- Draw up and label drugs as appropriate

# Endotracheal Intubation Medications



## Special Notes

- In patients with extremely poor perfusion, treat with fluid therapy +/- **Adrenaline** infusion concurrently with IFS or RSI. In NTBI consider quarter doses of sedation for SBP < 80 mmHg.
- Adrenaline must not be administered to TBI patients without consultation with a MTS
- In ROSC patients where the primary cause of cardiac arrest was likely cardiac, there is no suspicion of traumatic or non-traumatic brain injury and airway reflexes are absent, it is acceptable to follow the "Unassisted Endotracheal Intubation" pathway in CPG A0302.
- In ROSC patients where airway reflexes are present, or if there is evidence of traumatic or non-traumatic brain injury prior to the cardiac arrest, then intubation should be via RSI.
- In patients with ROSC requiring RSI, adjust **Fentanyl** dose according to GCS and perfusion status, eg:
  - A ROSC patient with GCS 3 and SBP 100 mmHg requires a smaller dose than the patient with GCS 9 and SBP 160 mmHg.
- Round **Ketamine** doses up to the nearest 10 mg (max. 200mg).

# Endotracheal Intubation Medications



## Unassisted Endotracheal Intubation

**Action**

- Proceed with intubation - no drugs required

## IFS

**Adjusted sedation dose required**

**Half dose sedation required**

- **SBP < 100 mmHg or frail/elderly**

**Action**

- **Fentanyl 50 mcg IV**
- **Midazolam 0.05 mg/kg IV (max. 5 mg)**

**Full dose sedation required**

- **SBP ≥ 100 mmHg**

**Action**

- **Fentanyl 100 mcg IV**
- **Midazolam 0.1 mg/kg IV (max. 10mg)**

**Do not proceed if Pt C/I for Suxamethonium**

**If unable to intubate due to excessive tone**

**Action**

- **Only** if Pt is frail or elderly and being intubated for respiratory failure
  - **Suxamethonium 1.5 mg/kg IV** rounded up to nearest 25 mg **(max. 150 mg)**

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# Endotracheal Intubation Medications

# CPG A0302

## RSI - NTBI

**Adjusted sedation dose required**

**Half dose sedation required**

- **SBP < 100 mmHg or frail/elderly**

**Action**

- **Fentanyl 50 mcg IV**
- **Midazolam 0.05 mg/kg IV (max. 5 mg)**
- If SBP < 80 mmHg consider:
  - **Fentanyl 25 mcg IV** and
  - **Midazolam 1 mg IV**

**Full dose sedation required**

- **SBP ≥ 100 mmHg**

**Action**

- **Fentanyl 100 mcg IV**
- **Midazolam 0.1 mg/kg IV (max. 10mg)**

**Paralysing agent**

**Action**

- If Pt bradycardic at any stage
  **- Atropine 600 mcg IV**
- **Suxamethonium 1.5 mg/kg IV** rounded up to nearest 25 mg **(max. 150 mg)**

**Perfusion**

**Action**

- If SBP < 120 mmHg despite **N/Saline 20 mL/kg**, administer **Adrenaline infusion** as per **CPG A0407** to maintain SBP > 120 mmHg
- If SBP > 160 mmHg administer **Midazolam 0.1 mg/kg IV** with target SBP 120 – 140 mmHg

## RSI - ROSC

**Adjusted Fentanyl dose required**
**Commence Mx inadequate perfusion prior to RSI**

**Sedation required**

**Action**

- **Fentanyl 50 - 200 mcg IV**

**If Fentanyl C/I, use Midazolam 1 - 5 mg IV as required**

**Paralysing agent**

**Action**

- If Pt bradycardic at any stage
  **- Atropine 600 mcg IV**
- **Suxamethonium 1.5 mg/kg IV** rounded up to nearest 25 mg **(max. 150 mg)**

**Perfusion**

**Action**

- Continue perfusion Mx as per **CPG A0202 Cardiac Arrest (ROSC Management)**

## RSI - Other Indications

**Ketamine C/I for Pts with SBP > 180**

**Action**

- If GCS < 10 (all other RSI indications)
  **- Ketamine 1.5 mg/kg IV (max. 200 mg)**
- If GCS ≥ 10 and suspected airway burns, consult with Alfred Hospital via AV Clinician for:
  **- Ketamine 1.5 mg/kg IV (max. 200 mg)**
  **- Midazolam 2.5 mg IV**

**Paralysing agent**

**Action**

- If Pt bradycardic at any stage
  **- Atropine 600 mcg IV**
- **Suxamethonium 1.5 mg/kg IV** round up to nearest 25 mg **(max. 150 mg)**

**Perfusion**

**Action**

- Continue perfusion Mx as per relevant CPG

**Adrenaline infusion must not be administered to TBI Pts without consultation with a MTS**



Status | Stop | Assess | Consider | Action | MICA Action

# Endotracheal Intubation Insertion of ETT



## Insertion of Endotracheal Tube

- Observe passage of ETT through cords, noting Australian Standard (AS) markings and grade of view.
- Inflate cuff.
- Confirm tracheal placement by capnography – note that patient in cardiac arrest may not have detectable $EtCO_2$ initially.
- Exclude right main bronchus intubation by auscultation of chest, including comparing air entry at the axillae.
- Auscultate epigastrium to exclude gastric placement.
- Note length at lips/teeth.
- Note supplemental cues of correct placement, e.g. tube misting, bag movement in the spontaneously ventilating patient, improved $SpO_2$ and patient colour.
- Secure the ETT and insert a bite block if required.
- **If there is ANY doubt about tracheal placement the ETT must be removed.**
- If unable to intubate after ensuring correct technique, proceed to **CPG A0303 Difficult Airway Guideline**.

## General Care of the Intubated Pt

- Reconfirm tracheal placement using $EtCO_2$ after every patient movement. Disconnect and hold ETT during all transfers.
- If electronic capnography fails after intubation, use colourimetric capnometry.
- Suction ETT and oropharynx in all patients.
- If time permits, insert OG or NG tube, aspirate and connect to drainage bag. The OG route **must** be used in head or facial trauma.
- Ventilate using 100% $O_2$ and tidal volume of 6-7 mL/kg. Aim to maintain $SpO_2$ > 95% and $EtCO_2$ at 30 – 35 mmHg except:
  - Asthma, where a higher $EtCO_2$ may be permitted,
  - TCA OD where the target $EtCO_2$ is 20 – 25 mmHg, and
  - Hyperglycaemia with a BGL reading of “high”, where the $EtCO_2$ should be maintained at the level detected immediately post intubation with a max of 25 mmHg.
- PEEP
  - Start with PEEP 5 cm $H_2O$. In the setting of acute lung injury, if $SpO_2$ remains < 92% increase PEEP to 10 cm $H_2O$.
- Document all checks and observations made to confirm correct ETT placement.

# Endotracheal Intubation Insertion of ETT



**Status**

- Insertion / general care of ETT
  - Unassisted endotracheal intubation
  - IFS
  - RSI

**Insertion and checks of ETT**

**Action**

- Confirm tracheal placement of ETT with capnography
- Length at lips / teeth
- Auscultate chest / epigastrium
- Check for chest rise and fall, bag movement, $SpO_2$, tube misting and Pt skin colour
- Specific insertion instructions as per Insertion of ETT

**If there is ANY doubt about tracheal placement, the ETT must be removed**

**General care / ventilation**

**Action**

- ETT checks with each Pt movement
- Provide circulatory support if hypotension present
- Use colourimetric capnometry if capnograph fails
- Suction ETT and oropharynx
- Insert OG / NG tube
- Ventilate via BVM or mechanical ventilator with PEEP 5 - 10 cm $H_2O$, $V_T$ 6 - 7 mL/Kg, aiming for $EtCO_2$ 30 - 35 mmHg if appropriate to Pt condition
- Monitor for signs of haemodynamic compromise and/or barotrauma that may occur secondary to higher levels of PEEP
- Disconnect and hold ETT during transfers
- Specific instructions as per General care of the Intubated Pt

# Endotracheal Intubation Care and Mx of Intubated Pt

# CPG A0302

## Special Notes

- For patients who become hypotensive after intubation consider additional fluid and/or **Adrenaline** infusion according to clinical context. If hypotension persists consider reducing the sedation dose while closely monitoring the patient for signs of under-sedation.
- Adrenaline must not be administered to TBI patients without consultation with a MTS
- Not all patients receiving drug facilitated intubation will require paralysis post intubation, e.g. status epilepticus, OD other than TCA.
- Some patients may require paralysis post intubation to control ventilation, e.g. asthma
- TBI patients and NTBI patients such as stroke or SAH require paralysis to prevent gagging and elevation in ICP.
- Where a mechanical ventilator is available, long-term paralysis is indicated to minimise the risk of barotrauma and haemodynamic compromise.
- In cases of status epilepticus (where long term paralysis is relatively contraindicated) use manual BVM ventilation instead of mechanical ventilation.

## General Care

- Infusion
  - **Morphine 30 mg + Midazolam 30 mg in 30 mL D5W or N/Saline**
  - 1 mL = 1 mg each drug
  - 1 mL/hr = 1 mg/hr
- **Fentanyl 300 mcg + Midazolam 30 mg in 30 mL D5W or N/Saline**
  - 1 mL = 1 mg **Midazolam** + 10 mcg **Fentanyl**
- Handover
  - The $EtCO_2$ and respiratory wave-form immediately prior to patient handover must be demonstrated to the receiving physician and documented on the ePCR.

Paralysis is C/I in status epilepticus unless unavoidable for patient safety reasons. It is clinically preferred to use additional doses of **Midazolam** as required to allow monitoring of seizure activity.
**Consult** with receiving hospital if considering paralysis in a seizing patient.

# Endotracheal Intubation Care and Mx of Intubated Pt

# CPG A0302

**Status**

- Intubated Pt

**Consider**

- If Pt requires sedation or sedation and paralysis to maintain intubation and ventilation

**Post intubation sedation**

- Restlessness / signs of under-sedation in the absence of other noxious stimuli - e.g. ETT too deep / irritating, occult pain
- Signs of inadequate sedation

| Paralysed Pt | Non paralysed Pt |
|---|---|
| - HR and BP trending up together<br>- Lacrimation<br>- Diaphoresis | - As per Paralysed<br>- Cough / gag / movement |

**Sedation**

**Action**

- **Morphine / Midazolam infusion 1 - 10 mL/hr IV, OR**
- **Fentanyl / Midazolam infusion 1 - 10 mL/hr IV**
  - Administer **0.5 mL - 5 mL IV** boluses as required to maintain sedation
- Until sedation infusion established:
  - **Midazolam 0.5 mg - 5 mg IV** as required, or
  - **Midazolam / Morphine 0.5 mg - 5 mg IV** each drug

**Post intubation paralysis**

- Traumatic or non-traumatic brain injury
- Where sedation alone is ineffective at maintaining intubation or allowing adequate ventilation / oxygenation
- As prescribed for interhospital transfer
- Reduction of metabolic heat production in hyperthermia

**Stop**

- All Pts receiving paralysis MUST receive ongoing sedation
- The ETT must be secured and tracheal placement confirmed with electronic capnography
- Paralysis is C/I for Pts in status epilepticus unless unavoidable for safety reasons (under consult only)

**Sedation and paralysis**

**Action**

- Sedate as per Post intubation sedation
- **Rocuronium 50 mg IV** repeat at 15 minute intervals
  - Repeat if evidence of returning muscular activity e.g. movement, coughing, gagging, chewing or curare cleft

# Difficult Airway Guideline

# CPG A0303

## Special Notes

- Desaturation is not the only prompt to progress through this guideline. Inability to ventilate/oxygenate the patient should provoke progress through the guideline. This includes moving to a surgical airway if other techniques are unsuccessful. Ideally if a patient cannot be ventilated/oxygenated, progression to cricothyroidotomy will occur prior to desaturation.
- Based on clinical judgement it may be appropriate to skip some steps in the guideline and advance to more advanced techniques earlier.
- Both the decision making and clinical skills in this guideline require frequent practice in order to maintain proficiency.

## General Care

- The Difficult Airway Guideline provides guidance for the actions to take in what will be a rare, extremely stressful situation. All AV staff should be familiar with it in order to maximise communication and teamwork in this circumstance.
- A commonly reported issue in “can’t intubate/can’t oxygenate” cases that leads to patient harm is a fixation error, where a clinician focusses on trying to achieve a particular task (such as intubation) instead of progressing to another option to manage the airway. In these circumstances it may be appropriate for another paramedic (including junior staff) to prompt the next step in the guideline, balancing the need to remain respectful with the need to protect the patient from harm.
- If airway management becomes difficult after induction of anaesthesia, a clear declaration that the Difficult Airway Guideline has been entered should be made so that the whole team is aware of the emergency. A clear declaration should also be made as each stage is progressed through until the ventilation/oxygenation is achieved.
- Intubation does not need to be attempted and be unsuccessful in order to enter the Difficult Airway Guideline. If a patient appears at assessment to present a difficult airway (e.g. due to factors such as morbid obesity, short neck, small mouth or facial trauma) this guideline may be an appropriate starting point for airway management.

# Difficult Airway Guideline

# CPG A0303

**Status**

- Difficult airway encountered or anticipated based on initial assessment

**Action**

- Communicate to the team that there is an issue with the airway
- Assess Pt position and implement steps to maximise chances of managing the airway – e.g. ramp the Pt, two-person BVM technique, consider airway adjuncts
- If reattempting intubation, use bougie and video laryngoscope where available

**Assess**

- Objective confirmation of tracheal placement using $EtCO_2$?

Yes

**Action**

- Continue Mx as per relevant CPG

No

**Action**

- Immediately remove ETT, insert OPA/NPA and ventilate with BVM

**Assess**

- Able to adequately ventilate and oxygenate?

Yes

**Action**

- If sedation and paralytic drugs were administered, allow them to wear off and the Pt to resume self-ventilating

No

**Action**

- Insert Supra-Glottic Airway and ventilate with BVM

**Assess**

- Able to adequately ventilate and oxygenate?

Yes

**Action**

- If sedation and paralytic drugs were administered, allow them to wear off and the Pt to resume self-ventilating
- Sedation to maintain the SGA may be considered as per **CPG A0301 Supra-Glottic Airway** if removal of the SGA may lead to the loss of the airway

No

**Action**

- Cricothyroidotomy



Status | Stop | Assess | Consider | Action | MICA Action

# Cricothyroidotomy

# CPG A0304

## 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 Magill'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 "Care and Mx of Intubated Pt" in **CPG A0302**

**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.**

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# Acute Coronary Syndrome

# CPG A0401

## Special Notes

**Care Objectives**

- 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, resolving pain where possible).

- The spectrum of ACS encompasses unstable angina, non ST-elevation ACS (NSTEACS) 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**.

## Special Notes

- 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.
- Pain – treat with nitrates and if unresolved, treat with opioids as per **CPG A0501 Pain relief.** The intent of analgesia in ACS is to make the patient comfortable. Getting the patient completely pain-free is not always possible and in some cases may be detrimental if excessive opioid doses are required to achieve it.
- Nausea/vomiting – treat as per **CPG A0701 Nausea and vomiting**
- LVF – treat as per **CPG A0406 Acute Pulmonary Oedema**
- Inadequate Perfusion – treat as per **CPG A0407 Inadequate Perfusion**
- Dysrhythmias – see appropriate CPG

# Acute Coronary Syndrome

# CPG A0401

## 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

### Action

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

## Pain Relief

### 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

### Inadequate response or Nitrates C/I

- Treat with opioids as per **CPG A0501 Pain Relief**

## Isolated Hypertension

- SBP > 160 mmHg or
- DBP > 100 mmHg

### Action

- **GTN 300 mcg S/L**
  - Repeat **300 mcg @ 5 minute intervals** if hypertension persists

## STEMI

### Action

- 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 ARV via clinician where secondary transfer may be required

## NSTEACS / unstable angina

### Action

- Transport to appropriate facility



Status | Stop | Assess | Consider | Action | MICA Action

# Bradycardia

# CPG A0402

## Special Notes

**Care Objectives**

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

- **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.

## General Care

- **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.

# Bradycardia

# CPG A0402

**Assess / Consider**

- Perfusion status
- Cardiac rhythm
- Heart failure
- Ischaemic chest pain

**Unstable**

- Less than adequate perfusion (including acute STEMI and ischaemic chest pain)
- Profound 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**

- Transthoracic 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)**
- Mx as per Inadequate response if patient deteriorates

Status | Stop | Assess | Consider | Action | MICA Action

# Tachycardia (Narrow Complex)

# CPG A0403

## Special Notes

### 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.

## General Care

### 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.

# Tachycardia (Narrow Complex) CPG A0403

**Status**

- QRS < 0.12 sec

**STOP**

- If patient loses C.O. at any stage Mx with synchronised cardioversion in addition to **CPG A0201 Cardiac Arrest (MICA only)**
- Mx of sinus tachycardia should be directed at the underlying cause (e.g. hypovolaemia, pain) and not treated using this CPG

**Stable – SVT (AVNRT or AVRT)**

**Exclude AF and atrial flutter**

**Action**

SBP ≥ 90mmHg:

- Record 12 lead ECG prior to commencing Mx
- **Modified Valsalva** or **Standard Valsalva** (if manual handling or environmental concern)
  - Repeat x2 **@ 2 minute intervals (Max. 3 attempts)**

SBP < 90mmHg or no reversion with **Valsalva**:

- **Adenosine 6 mg IV**
  - **Adenosine 12 mg IV** If no reversion after 2 minutes
  - **Adenosine 12 mg IV** If no reversion after a further 2 minutes

**Stable – Other rhythms**

- Atrial fibrillation
- Atrial flutter
- Multifocal atrial tachycardia

**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**

**Action**

- Pain relief as per **CPG A0501 Pain relief**

# Tachycardia (Broad Complex)

# CPG A0404

## Special Notes

**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.

- 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.

## General Care

- 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.

# Tachycardia (Broad Complex) CPG A0404

**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**

**Stop**

- 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 5 mg/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

# Pulmonary Oedema

# CPG A0406

## Special Notes

**Care Objectives**

- 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.

- **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.

## General Care

- 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

# Pulmonary Oedema

# CPG A0406

**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 causes

# CPG A0407

## Special Notes

**Care Objectives**

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

- 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.

## General Care

- **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.

# Inadequate Perfusion Cardiogenic causes

# CPG A0407

**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 10 mcg 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**

# STEMI Management

# CPG A0408

## Special Notes

**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.

- 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.

**Contact the cardiology consult service on 1800 870 442**

# STEMI Management

# CPG A0408

**STEMI**

- STEMI identified or monitor identifies acute infarct.

**Action**

- Transmit ECG
- Request MICA (ALS)
- Treat as per **CPG A0401 Acute coronary syndrome**

**Symptoms > 12 hours**

**Action**

- Continue Mx as per **CPG A0401 Acute coronary syndrome**
- Transport with notification

**Symptoms < 12 hours**

**Assess**

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

**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 **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

**Prehospital thrombolysis**

- **Time to PCI > 1 hour** (PHT endorsed and equipped paramedic) **AND**
- All inclusion criteria met **AND**
- No exclusion criteria met

**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 C/I are present

**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
- Transport with hospital notification
- Transmit 12-lead ECG to receiving hospital
- Capture a repeat ECG 30 minutes prior to arrival and transmit to receiving hospital with notification

# STEMI Management Checklist

# CPG A0408

## Thrombolysis exclusion criteria

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

| | YES | NO |
|---|---|---|
| Has the patient had major surgery in the past 3 months?<br>• *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* | | |
| Has the patient had a significant head injury in the past 3 months?<br>• *Significant head injury is an injury that was severe enough to result in an injury visible on CT scan* | | |
| Has the patient had major trauma in the past 3 months?<br>• *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* | | |
| Has the patient had a stroke/TIA in the past 3 months, or ICH at any time? | | |
| Has the patient had a GI or genitourinary bleed in the past month? | | |
| Does the patient have a current bleeding disorder, active bleeding (excluding menses) or have bleeding tendencies? | | |
| Is the patient currently taking anticoagulants (incl. warfarin, heparin, enoxaparin, dabigatran, rivaroxaban, apixaban) or glycoprotein IIb/IIIa inhibitors (e.g. abciximab, eptifibatide, tirofiban)? | | |
| Does the patient have an allergy to **Tenecteplase** or gentamicin? | | |

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

**Contact the cardiology consult service on 1800 870 442**

# STEMI Management Checklist

# CPG A0408

## ✔ Thrombolysis inclusion criteria

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

| | YES | NO |
|---|---|---|
| Did the symptoms start **less than 12 hours** ago? | | |
| Does the monitor ECG interpretation indicate STEMI or 12-lead ECG shows ST elevation in two or more contiguous leads:<br>• ≥ 2.5 mm ST elevation in leads V2-3 in men aged <40 years, or<br>• ≥ 2 mm ST elevation in leads V2-3 in men aged ≥40 years, or<br>• ≥ 1.5 mm ST elevation in V2-3 in women, or<br>• ≥ 1 mm in other leads, or<br>• 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:

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

*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.**

# STEMI Management Medications



## Tenecteplase

### Tenecteplase Dose Table

| | |
|---|---|
| < 60 kg | IV 30 mg - 6,000 units (6 mL) |
| 60 - 69 kg | IV 35 mg - 7,000 units (7 mL) |
| 70 - 79 kg | IV 40 mg - 8,000 units (8 mL) |
| 80 - 89 kg | IV 45 mg - 9,000 units (9 mL) |
| ≥ 90 kg | IV 50 mg - 10,000 units (10 mL) |

Table 1

**Age adjusted dose for patients ≥ 75 years**

Following consultation for patients ≥ 75 years, the **Tenecteplase dose MUST be halved.**

**Contact the cardiology consult service on 1800 870 442**

# STEMI Management Patient Information Statement



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."*

# STEMI Management Post-thrombolysis care



## General Care of the thrombolysed patient

- 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 A40501 Pain Relief;** and
  - Nausea and vomiting as per **CPG A0701 Nausea and Vomiting**.

**Contact the cardiology consult service on 1800 870 442**

# STEMI Management Post-thrombolysis care

# CPG A0408

**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**

**Altered conscious state**

- Monitor patient's GCS as per **CPG A0104 Conscious State Assessment**

**Action**

- If altered conscious state develops consider and correct other causes e.g. poor perfusion, hypoglycaemia etc.
- If altered conscious state persists, Mx as per **CPG A0711 Stroke / TIA**

**Arrhythmia Mx**

- Reperfusion arrhythmias are common and to be expected post thrombolysis.
- Anti-arrhythmic agents are indicated only if the arrhythmia persists for > 2/60 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**

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# Pain Relief

# CPG A0501

## Special Notes

**Care objectives**

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

- 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.
- 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**)
- 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).
- 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)

## General Care

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

# Pain Relief

# CPG A0501

**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**

**Action**
- Consider non-pharmacological management options as appropriate e.g. splinting, cold / heat therapy

## Mild pain

**Action**

If Pt requests analgesia consider:

- **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)

- If pain not controlled or rapid pain relief required, consider treating as per Moderate pain

- Paracetamol should not be used to treat chest pain in suspected acute coronary syndrome

## Moderate pain

**Action**

IV access available:

- **Morphine up to 5 mg IV** (consider contraindications) Repeat up to **5mg at 5 minute intervals** (consult after **20 mg IV**)

**OR**

- **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** (consult after **200 mcg IN**)

**OR**

- **Fentanyl 200 mcg IN**
  - Repeat up to **Fentanyl 50 mcg IN at 5 minute intervals** (consult after **400 mcg IN**)

Moderate procedural pain or unable to administer Fentanyl IN:

- **Methoxyflurane 3 mL inhaled**
  - Repeat **3 mL** if required (**max. 6 mL**)

- Consider **Paracetamol** as per Mild pain in combination with opioids

## Severe pain

**Action**

IV access available:

- **Morphine IV** OR **Fentanyl IV** as per Moderate pain

IV access delayed or unsuccessful:

- **Fentanyl IN** or **Methoxyflurane** as per Moderate Pain
- Consult for **Ketamine IV** in extreme traumatic pain (ALS)

Consider **Morphine IM** as a last resort:

**Morphine 0.1 mg/kg IM** (single dose only) (weight < 60 kg or frail or elderly)

**OR**

- **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

Extreme 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**

# **Pain Relief** Chronic Pain

# CPG A0501

## Special Notes

- 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, post-stroke 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.

## Special Notes

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.

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# Headache

# CPG A0502

## Special Notes

- **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.

# Headache

# CPG A0502

**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

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# Asthma

# CPG A0601

**Status**
- Respiratory distress

**Assess**
- Severity of asthma presentation

**Stop**
- This CPG should be read in conjunction with **CPG A0001 Oxygen Therapy**

**Conscious**
**Mild / moderate / severe**

**Action**
- See **CPG A0601** ●

**Unconscious / Becoming unconscious with poor / no ventilation**

**Action**
- See **CPG A0601** ●●

**No cardiac output**

**Action**
- Loses C.O. See **CPG A0601** ●●●
- PEA as per **CPG A0201 Cardiac Arrest**

# Asthma

# CPG A0601

## Special Notes

- 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 $SpO_2$ 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.

## General Care

- **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.

# Asthma

# CPG A0601

**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**

**Adequate Response**

**Action**
- Tx with continued reassessment

**No Significant Response after 20 minutes**

**Action**
- Rx as per Severe

**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**

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

**Action**

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)**

# Asthma

# CPG A0601

**Status**

- Unconscious / becomes unconscious
  - with poor or no ventilation but still with C.O.

**Pt requires immediate assisted ventilation**

**Action**

- Ventilate $V_T$ **6 - 7 mL/kg @ 5 - 8 ventilations/minute**
- Moderately high respiratory pressures
- Allow for prolonged expiratory phase

**Adequate response**

**Action**

- Rx as per Severe respiratory distress ●

**Inadequate response**

**Action**

- Rx as per Severe respiratory distress ●
- Consider ETT as per **CPG A0302 Endotracheal Intubation**

**If Pt loses C.O. at any stage, see CPG A0601 ●●●**

# Asthma



## Special Notes

- High EtCO2 levels should be anticipated in the intubated asthmatic patient and are considered safe.
- Despite EtCO2 levels, treatment should not be adjusted and managing ventilation should be conscious of the effect of gas trapping when attempting to reduce EtCO2.
- 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 Care

- 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**

# Asthma

# CPG A0601

**Status**

- Pt loses C.O.
  - especially during assisted ventilation and bag becomes stiff

**Pt requires immediate intervention**

**Action**

- **Apnoea 1 minute**
  - Prepare for potential resuscitation

**Cardiac output returns**

**Action**

- Rx as per **CPG A0601**

**Carotid pulse, no BP**

**Action**

- **Adrenaline 50 mcg IV**
  - Repeat **50 - 100 mcg IV at 1 minute intervals** as required
- **Normal Saline 20 mL/kg IV**

**No return of output**

**Action**

- Mx as per appropriate **CPG A0201 Cardiac Arrest**

# **COPD** Chronic Obstructive Pulmonary Disease

# CPG A0602

## Special Notes

**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.

## Special Notes

**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

# **COPD** Chronic Obstructive Pulmonary Disease

# CPG **A0602**

**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 $O_2$ flow to target $SpO_2$ 88 – 92%
- Consider low flow $O_2$ e.g. nasal prongs

**Inadequate response after 10 minutes**

**Action**
- **If continuing severe respiratory distress and RR > 24:**
  - **CPAP** (commence with **7.5 cm $H_2O$**)
  - Increase **CPAP** to **10 cm $H_2O$ 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% $O_2$ if inadequate $V_T$ or RR
- Consider ETT as per **CPG A0302 Endotracheal Intubation**

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# Nausea and Vomiting

# CPG A0701

## Special Notes

- 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.

## General Care

- **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 anti-emetic 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.

# Nausea and Vomiting

# CPG A0701

**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 8 mg IV**
- If known allergy or C/I to **Ondansetron** and ≥ 21 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**

**Vestibular nausea**

- Potential for motion sickness
- Planned aeromedical evacuation
- Vertigo

**Action**

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 ≥ 21 years**, Prochlorperazine 12.5 mg IM**



Status | Stop | Assess | Consider | Action | MICA Action

# Hypoglycaemia

# CPG A0702

## Special Notes

- 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**).
- Ensure sufficient advice on further management and follow-up if patient refuses transport.
- Consult early for **Dextrose 10% IV** in the setting of an insulin overdose even if BGL > 4 mmol/L and/or patient obeying commands.

## General Care

- 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 patient fully recovered and not appropriate for 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 recur and of the need to make early contact with LMO for follow up.
- If inadequate response transport without undue delay.
- Maintain general care of unconscious patient and ensure adequate airway and ventilation.
- Further dose of **Dextrose 10%** may be required in some hypoglycaemic episodes. Consider consultation if BGL remains less than 4 mmol/L and unable to administer oral carbohydrates.
- Continue initial management and transport.

# Hypoglycaemia

# CPG A0702

**Status**
- Evidence of probable hypoglycaemia
  - e.g. Hx diabetes, unconscious, pale, diaphoretic

**Assess**
- BGL

**BGL > 4 mmol/L**

**Action**
- BLS
- Consider other causes of altered conscious state
  - e.g. stroke, seizure, hypovolaemia

**BGL < 4 mmol/L Responds to commands**

**Action**
- **Glucose 15 g oral**

**BGL < 4 mmol/L Does not respond 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 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 Treat and Refer - Hypoglycaemia**

**Poor response**

**Action**
- Consider **Dextrose IV** or **Glucagon 1 IU IM**

**Adequate response**
- GCS 15

**Action**
- Cease administration of **IV Dextrose**
- If patient has recovered fully consider Treat and Refer pathway as per **CPG TR0204 Treat and Refer - Hypoglycaemia**

**Inadequate response**
- GCS < 15 after 3 minutes

**Action**
- Repeat **Dextrose 10% 10g (100 mL) IV** titrating to Pt conscious state
  - **Normal Saline 10 mL** flush



Status | Stop | Assess | Consider | Action | MICA Action

# Seizures

# CPG A0703

## Special Notes

- 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 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**.

## General Care

- 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

**Status**
- Seizure activity

**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 disturbance, meningitis
- Consider patient's own management plan and treatment already given

**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**

**Generalised Convulsive SE**

**Action**
- Manage airway and ventilation as required
- If airway patent, administer high-flow $O_2$ 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**

**Seizure activity ceases**

**Action**
- BLS
- Continue to monitor airway, ventilation, conscious state and BP

**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**

**Pancuronium C/I unless unavoidable (consult)**

**No response after 10 minutes**
- No IV access / no accreditation

**Action**
- 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



Status | Stop | Assess | Consider | Action | MICA Action

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# Anaphylaxis

# CPG A0704

## Special 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 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.

## General Care

- 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 auto-injectors 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**

Further reading: Australasian Society of Clinical Immunology and Allergy (ASCIA). Advanced Acute management of anaphylaxis guidelines. Available from: https://www.allergy.org.au/hp/papers/acute-management-of-anaphylaxis-guidelines

# Anaphylaxis

# CPG A0704

## Status

- Suspected anaphylaxis

## 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
- Reassess 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 deterioration (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

## 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 **$O_2$** as per **CPG A0001 Oxygen Therapy**
- Mx respiratory distress as indicated
  - Rx bronchospasm with **Salbutamol** as per **CPG A0601 Asthma**
  - Consider **nebulised Adrenaline** for upper airway oedema as per **CPG P0601 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

## Irrespective of symptom resolution

**Action**

- Tx
- Reassess en route
- Monitor for recurring symptoms

## Inadequate Response

- Extremely poor perfusion and/or
- Impending cardiac arrest

**Action**

- **Adrenaline** as per **CPG A0705 Inadequate Perfusion (Non-cardiogenic / Non-hypovolaemic)**
- Consider intubation

# **Inadequate Perfusion** Non-cardiogenic / Non-hypovolaemic

# CPG A0705

## Special Notes

- 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 > 38ºC or < 36ºC
  - HR > 90 bpm
  - RR > 20/minute
  - BP < 90 mmHg

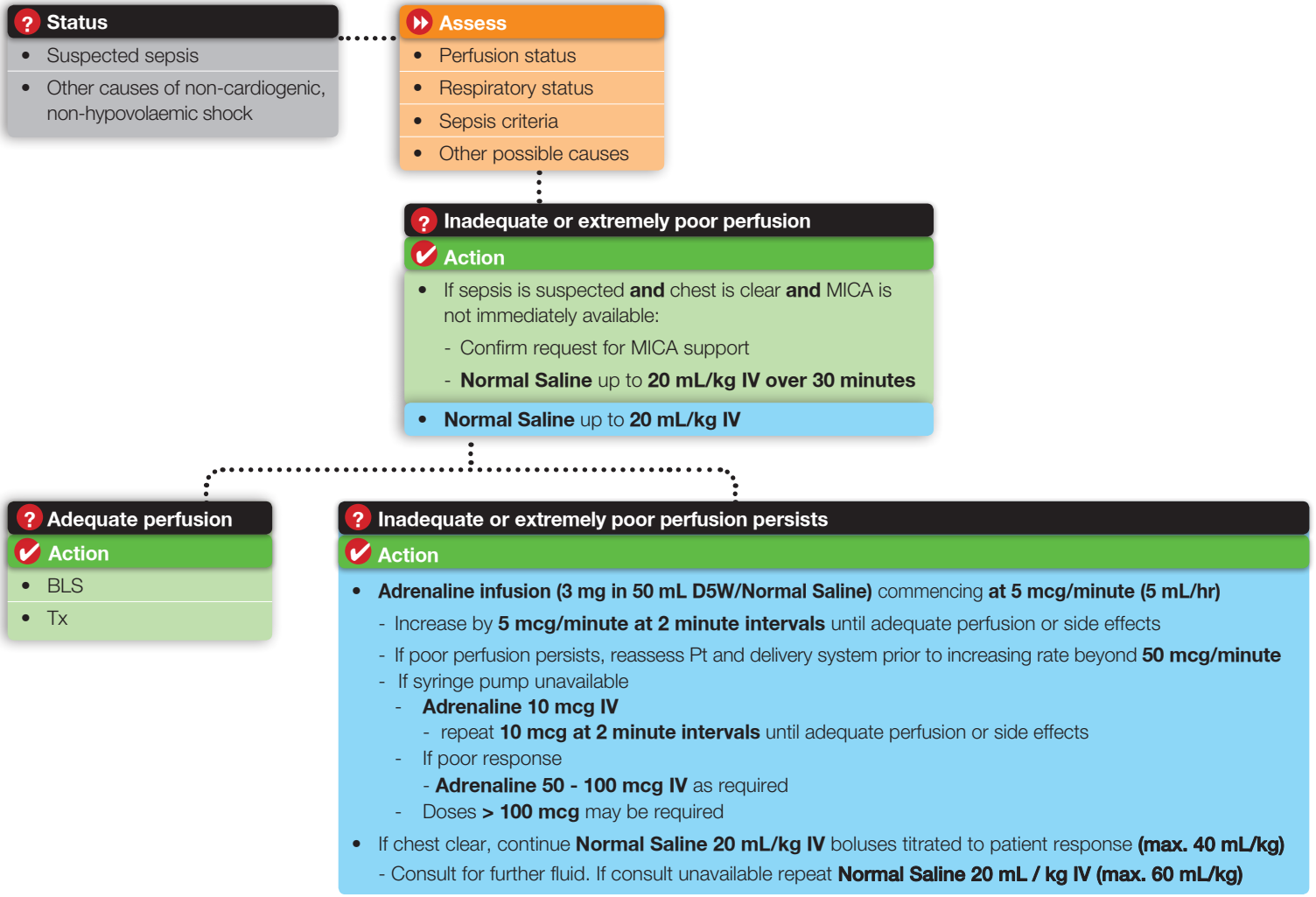
## General Care

- **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).

# Inadequate Perfusion Non-cardiogenic / Non-hypovolaemic CPG A0705



# Meningococcal Septicaemia

# CPG A0706

## Special 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.

## General Care

**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.

# Meningococcal Septicaemia

# CPG A0706

**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**

- Unable to gain
- Not IV accredited

**Action**

- **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

# Overdose

# CPG A0707

## Special Notes

- 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 or serious untreated injuries.
- If the patient claims to have taken an OD of a potentially life-threatening 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.

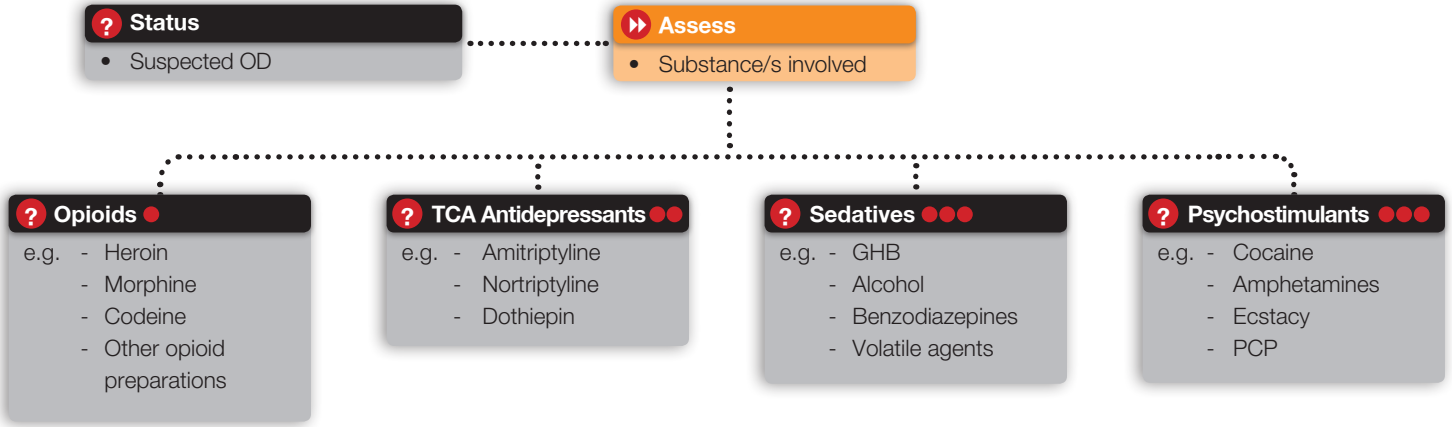
## General Care

- 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.**
- 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).

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.

# Overdose





# **Overdose:** Opioids

# CPG A0707

## Special Notes

- 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

# Overdose: Opioids



**Status**
- Possible opioid OD

**Stop**
- Ensure personal / crew safety
- Scene may have concealed 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**

**Adequate response**

**Action**
- 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**

**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**

# **Overdose:** Tricyclic Antidepressants (TCA)



## Special Notes

**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

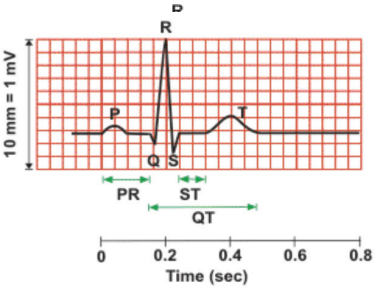
This could lead to aspiration, hyperthermia, rhabdomyolysis and APO.

## Special Notes

**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.

**How to measure a QT interval is shown below.**




P wave (0.08 - 0.10 sec) QRS (0.06 - 0.10 sec)

P-R interval (0.12 - 0.20 sec) Q-$T_C$ interval (≤ 0.44 sec)*

$$*QT_c = QT/\sqrt{RR}$$

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

# Overdose: Tricyclic Antidepressants (TCA)



**Status**
- Possible TCA OD

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

**No signs of toxicity**

**Action**
- 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% 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% $O_2$ - rate 20 - 24/minute
  - $EtCO_2$ target 20 - 25 mmHg if intubated

# Overdose: Sedative Agents / Psychostimulants



## Special Notes

- **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.

# Overdose: Sedative Agents / Psychostimulants

# CPG A0707

**Status**
- Sedative agents
- Psychostimulants

**Assess**
- Substance involved

**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 Syndrome**
- Mx temp as per **CPG A0902 Hyperthermia / Heat Stress** or **A0901 Hypothermia / Cold exposure**
- Mx agitation / aggression as per **CPG A0708 Agitation/ Delirium**

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# Agitation

# CPG A0708

## Special Notes

- This CPG applies to patients who present with agitation or aggressive/ violent behaviour. It may be used for those who are designated as Compulsory Patients under the Mental Health Act 2014; and also those who are in Police custody under section 351 of the Mental Health Act 2014
- Patients initially managed under the **Mild/Moderate Agitation** section can be escalated to the **Extreme Agitation** section if their behaviour deteriorates and they present more at risk than when first assessed, with the maximum doses of medications in that section then applying.
- Under the **Extreme Agitation** section of the CPG, it is preferable to manage the patient with **Ketamine** as the first option if available.
- Rousable drowsiness is defined as the patient being asleep but rousing if their name is called.

**Hyperthermic psychostimulant overdose**

- Sedation should be initiated early in hyperthermic patients who have been using psychostimulants to assist with cooling and avoid further increases in temperature secondary to agitation.

**Methamphetamine affected patients**

- Patients affected by methamphetamine ("Ice") may present with extreme 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 **Extreme Agitation** section of this CPG using **Ketamine**. Target therapeutic doses of **Ketamine** are **4 mg/kg IM** or **1 mg/kg IV**.

**Traumatic head injury**

- In patients with mild to moderate acute traumatic head injury (GCS 10 – 14), sedation can only be given after consultation with the duty AV Clinician.
- Agitation in traumatic or hypoxic brain injury should be managed with adequate analgesia.

**Elderly / Frail Patients**

- Elderly and/or frail patients are particularly sensitive to the effects of benzodiazepines including **Midazolam**. Aim to use the lowest dose possible and carefully monitor for side effects.
- 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.

**Paediatric Patients (< 12 years of age)**

- Paramedics must consult with RCH via the Clinician before sedating paediatric patients under this guideline.

## General Care

- Paramedic safety is paramount at all times. Do not attempt any element of this CPG unless all necessary assistance is available. Prior to administering sedation, clear communication with all parties involved in restraining the patient is a key factor in reducing the risk of needlestick or other injuries.
- Bodily restraint using 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.
- The anterolateral mid-thigh is the preferred site for IM injection. Access to this will likely be dictated by the position the patient is restrained in.
- Restraint devices should be removed if there is any evidence of compromised patient care, however Paramedic safety is paramount.
- The indications for the use of restraints, type of restraint and the time of application and removal must be documented on the PCR.
- In all cases where sedation is administered, supportive care should be provided as required including:
  - airway management
  - supplementary $O_2$ as per **CPG A0001 Oxygen Therapy** if sedated with **Midazolam OR** as routine if sedated with **Ketamine**
  - perfusion management as per **CPG A0705 Inadequate Perfusion (Non-cardiogenic / Non-hypovolaemic)**
  - temperature management as per **CPG A0901 Hypothermia / Cold Exposure or CPG A902 Environmental Hyperthermia / Heat Stress**
  - reassessment and management of clinical causes of agitation.
- The indications for the use of sedation must be clearly documented on the PCR.
- The **Mild / Moderate Agitation** pathway is intended for patients who do not present a high risk of extreme violence or for whom the risk is expected to be controlled with **Midazolam** alone, e.g. a combative dementia patient or a hyperthermic psychostimulant patient presenting with agitation/restlessness rather than violence.
- The **Extreme Agitation** pathway is intended to provide protection for patients and staff in circumstances where there is a high risk of extreme violence and the priority is to sedate the patient quickly. It should be applied judiciously and exercising clinical judgement.
- 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)

# Agitation

# CPG A0708

**Status**

- Agitated patient

**Stop**

- **Paramedic safety is paramount**
  - Hazards
  - Violence
  - Clear egress
  - Body fluids
  - Sharps
  - Reduce stimuli

**Agitated Pt**

**Action**

- Communicate with patient
  - Avoid confrontational behaviour
  - Gain patients co-operation for assessment
  - Utilise verbal de-escalation strategies

**Assess / consider**

- Assess and Mx clinical causes (as far as possible)
  - A Alcohol / drug intoxication
  - E Epilepsy (post-ictal)
  - I Insulin or other metabolic cause – hypo / hyperglycaemia, renal / liver failure
  - O Overdose / oxygen (hypoxia)
  - U Underdose (including alcohol / drug withdrawal)
  - T Trauma (head trauma) – consult with Clinician if (after pain relief) patient requires sedation
  - I Infection / sepsis
  - P Pain / psychiatric condition
  - S Stroke / TIA
- Also consider grief or extreme stress
- There may be a combination of factors
- Extreme agitation will be undifferentiated agitation as assessment will usually be impossible. Therefore, as soon as practicable after the patient is controlled, reversible causes should be managed and treatment of identified clinical issues commenced

## Able to Mx without restraint / sedation

**Action**

- Manage causes as per appropriate CPG
- Beware patient condition may change and agitation increase requiring restraint / sedation
- Transport to appropriate destination, ensuring sufficient assistance in transit
- Provide early notification to receiving hospital as appropriate

## Requires restraint / sedation

- Does not respond to verbal de-escalation
- Clinical causes have been excluded
- Patient risk to themselves or others
  - Combative, agitated or aggressive

**Stop**

- If patient severely agitated or violent, treat as per **Extreme Agitation**
- Ensure sufficient physical assistance
- 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 restraints as required – including to sedated patients

## Mild / Moderate Agitation

**Action**

- **Midazolam 5 - 10 mg IM**

  - Administer lower doses **(2.5 – 5 mg IM)** for elderly, frail, weight < 60 kg, SBP < 100mmHg, or sedating drug / alcohol involvement
  - Repeat at **10 minute intervals** if necessary, titrated to patient response
  - **Max. total dose 20 mg**. Consult for further if required

- **Midazolam 2.5 - 5 mg IV**

  - Administer lower doses **(1 – 2 mg IV)** for elderly, frail, weight < 60 kg, SBP < 100mmHg, or sedating drug / alcohol involvement
  - Repeat at **5 minute intervals** if necessary, titrated to patient response
  - **Max. total dose 30 mg**. Consult for further if required
  - IM injections may be indicated until IV access can be established

## Extreme Agitation

**Action**

- Administer **Ketamine IM**
  - < 60 kg **200 mg**
  - 60 – 90 kg **300 mg**
  - > 90 kg **400 mg**
- If **Ketamine** not available: **Midazolam up to 20 mg IM**
  - Repeat at **10 minute intervals** if necessary, titrated to patient response
  - **Max. total dose 40 mg**. Consult for further if required
- If an IV is in situ, **Ketamine 50 - 100 mg IV**
- Once Pt is controlled and an IV in situ, maintain sedation with **Midazolam 2.5 - 5 mg IV** at **5 minute intervals** if necessary. **Max. total dose of Midazolam 60 mg (IM+IV)**

# Organophosphate Poisoning

# CPG A0709

## Special Notes

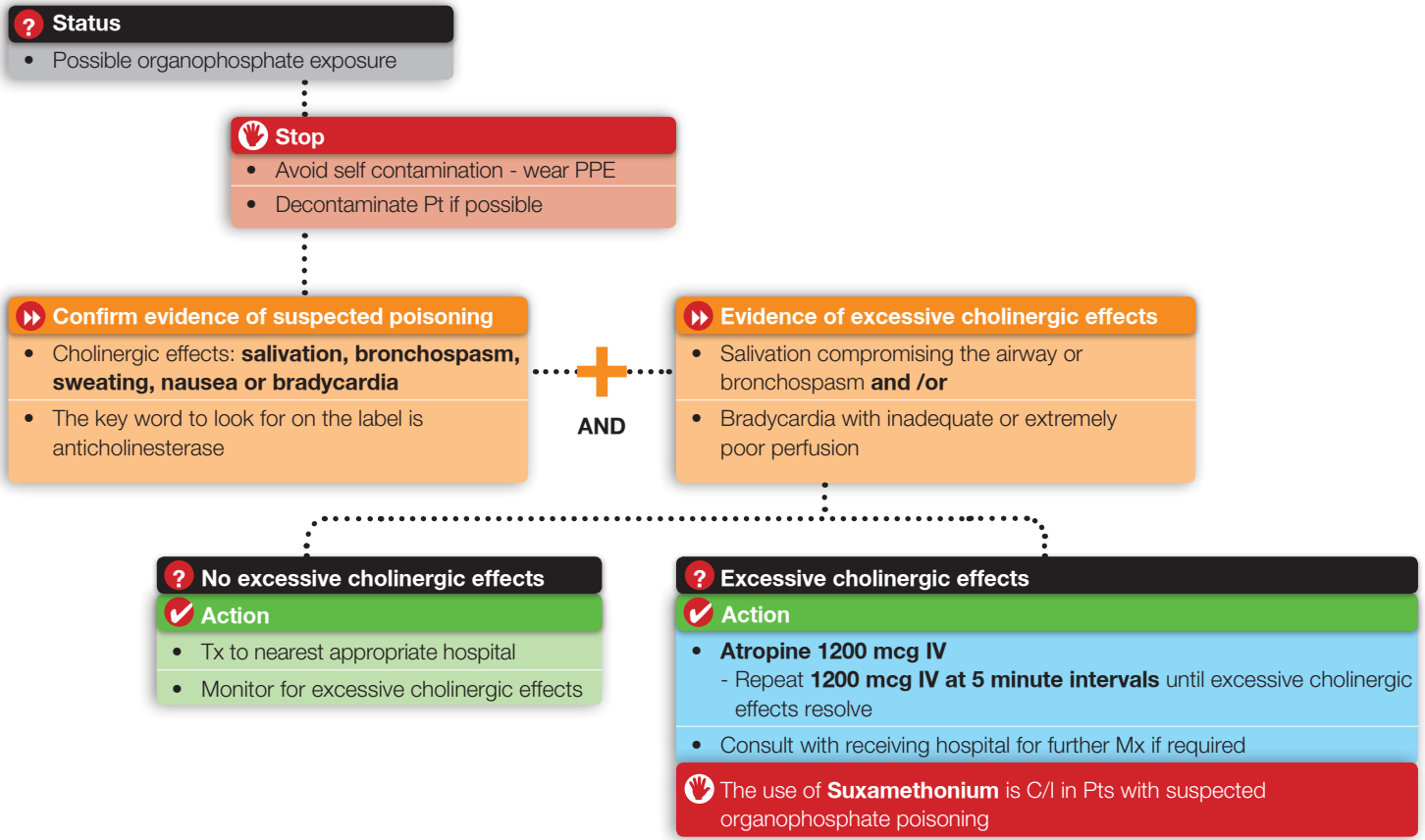
- Notification to receiving hospital essential to allow for patient isolation and decontamination.
- The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used not only commercially but also domestically.
- Given potential contamination by 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.

# Organophosphate Poisoning

# CPG A0709



# Autonomic Dysreflexia

# CPG A0710

## Special Notes

- 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.

# Autonomic Dysreflexia

# CPG A0710

**Status**
- Possible autonomic dysreflexia

**Confirm Autonomic Dysreflexia**
- Previous spinal cord injury at T6 or above
  - Severe headache and/or
  - SBP > 160 mmHg

**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

**If systolic BP remains > 160 mmHg**

**Action**
- **GTN 300 mcg S/L** (no prev. admin) **or**
  **GTN 600 mcg S/L**

**Adequate response**

**Action**
- Tx to nearest appropriate hospital

**Inadequate response - BP remains > 160 mmHg**

**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

# Stroke / TIA

# CPG A0711

## Special Notes

- Suspected stroke is a time critical emergency – early assessment and exclusion of stroke mimics is important.
- **Symptom onset time** is taken from when patient last seen symptom free (e.g. if wakes with symptoms then time patient went to bed).
- Treatment times from symptom onset are:
  - thrombolysis – up to 4.5 hrs
- Diagnosing and managing stroke patients with thrombolysis is a priority over seeking neurosurgical support.
- Urgent secondary transfer of stroke patients to a centre with Stroke Unit Care may be organised and involve the Clinician / AAV / ARV.
- TIA can only be suspected if signs and symptoms completely resolve, otherwise patient should be treated as a suspected stroke.
- TIA is often a sign of an impending stroke – all TIAs should be conveyed to hospital for investigation.
- Approximately 15% of strokes are intracranial haemorrhage (ICH). These patients have potential for rapid deterioration.
- Intracranial haemorrhage can be suspected where:
  - GCS < 10 and the patient is not alert.
  - The patient complained of severe headache.
  - Nausea and vomiting is present.
  - Slow pulse and hypertension is noted.
  - Pupil abnormalities are noted.
  - Abnormal patterns of respiration are noted.
- MASS – Melbourne Ambulance Stroke Screen. Validated criteria used in prehospital stroke assessment.

## General Care

- Intubation by MICA Paramedics should be considered where there is difficulty maintaining adequate airway, oxygenation and ventilation. Intubation should not be considered as a mandatory practice in management of all these patients. Time to hospital versus time to undertake the procedure should be considered.
- Gagging should be avoided in the management of the non traumatic intracranial event patient. The effect of gagging may vary in its detriment compared to the traumatic head injured patient.
- **Prochlorperazine** has the potential to cause drowsiness. Its use must be balanced against a potential reduction in conscious state in these patients. The use of **Prochlorperazine** is indicated as an analgesia adjunct for the management of headache. It is unlikely to have a beneficial effect for intracranial haemorrhage/SAH.
- $O_2$ therapy should be reserved for hypoxic patients with an $SpO_2 < 94\%$. The use of routine $O_2$ therapy is not recommended.

# Stroke / TIA

# CPG A0711

**Status**
- Suspected stroke or TIA

**Assess**
- Symptom onset time
- Stroke mimics
- Co-morbidities

**Stroke Mimics**
- Intoxication drug/ alcohol
- Hypo/hyperglycaemia
- Seizures
- Brain tumour
- Syncope
- Middle ear disorder
- Migraine
- Subdural haematoma
- Sepsis
- Electrolyte disturbances

**Co-morbidities**
- Dementia
- Significant pre-existing physical disability

**Assess for MASS criteria**

**Action**
- In the setting of normal BGL, a finding of one or more of the symptoms below is indicative of stroke:

**Stroke signs and symptoms**

| Assessment findings | | | |
|---|---|---|---|
| Facial Droop | Pt shows teeth or smiles | **Normal** - both sides of face move equally | **Abnormal** - one side of face does not move as well as the other |
| Speech | The Pt repeats "You can't teach an old dog new tricks" | **Normal** - the Pt says the correct words, no slurring | **Abnormal** - the Pt slurs words, says the wrong words, or is unable to speak or understand |
| Hand grip | Test as for GCS | **Normal** - equal grip | **Abnormal** - unilateral weakness |
| Blood glucose | Test for BGL | **Abnormal** -if hypoglycemia Mx as per **CPG A0702 Hypoglycemia** | **Normal** BGL |

**Management**

**Action**
- BLS – maintain adequate airway and ventilation
- Mx symptomatically – support affected limbs
- Provide analgesia as per **CPG A0502 Headache**
- Rx sustained seizure activity as per **CPG A0703 Seizures**
- If GCS < 10 consider ETT as per **CPG A0302 Endotracheal Intubation**

**Transport**

**Action**
- Where Pt is unstable consider time to appropriate receiving hospital versus R/V with MICA / AAV.
- **If Pt is stable with no significant co-morbidities, onset time < 4.5 hr and Tx time < 1 hr** – then transfer to the nearest hospital providing thrombolysis or stroke unit care and notify of pending arrival.
- **If Pt does not meet criteria above** – then Tx to a closer centre preferably with stroke unit care / CT imaging.
- If Pt deteriorates consider R/V with MICA / AAV



Status | Stop | Assess | Consider | Action | MICA Action

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# Palliative Care

# CPG A0712

## Special Notes

### Care Objectives

- 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.

- 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.

## General Care

- 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**

# Palliative Care

# CPG A0712

## Special Notes

- 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). Paediatric palliative care services will provide instruction over the phone on how to access their patient's devices.
- If a paediatric palliative care patient is attended, the Victorian Paediatric 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.

## General Care

- 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.

# Palliative Care

# CPG A0712

**Status**

- Patient in the care of a community palliative care service
  **AND**
- 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**

**Cross check calculations with partner and/or Clinician**

**Action**

- Treat nausea/vomiting as per **CPG A0701 Nausea and vomiting**
- Treat distressing pain, mild agitation caused by pain, or dyspnoea 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



Status | Stop | Assess | Consider | Action | MICA Action

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# Principles of Major Trauma

CPG A0800

## Introduction

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

**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

- 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.

# Haemorrhagic Hypovolaemia

# CPG A0801

## Special Notes

**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.

- 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 manage 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**

# Haemorrhagic Hypovolaemia

# CPG A0801

**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**

**Prioritise immediate transport**

**Action**

- **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)

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# Chest Injuries

# CPG A0802

## Special Notes

**Care objectives**

- To identify and manage time critical chest injuries such as tension pneumothorax

**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 $SpO_2$ 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.

## General Care

**Chest decompression**

- Insertion site for cannula/intercostal catheter (SMART):
  - **S**econd intercostal space
  - **M**id - clavicular line (avoiding medial placement)
  - **A**bove rib below (avoiding neurovascular bundle)
  - **R**ight angles to chest
  - **T**owards 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.

# Chest Injuries - General



**Status**
- Chest injury
  - Traumatic
  - Spontaneous
  - Iatrogenic

**Assess**
- Respiratory status
- Type of chest injury

**Action**
- Supplemental $O_2$ as per **CPG A0001 Oxygen therapy**
- Pain relief as per **CPG A0501 Pain relief**
- 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**
- Signs of pneumothorax

**Action**
- See **CPG A0802 Chest injuries –Tension Pneumothorax**

# Chest Injuries - 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
  - $SpO_2$ < 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
  - ↓ $SpO_2$ to < 92 % despite $O_2$
  - ↓ Conscious state
  - Poor perfusion or ↑ HR +/- ↓ BP
  - ↑ Peak inspiratory pressure (ventilator) / stiff bag
  - ↓ $EtCO_2$
  - ↑ 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

# Traumatic Head Injury

# CPG A0803

## Special Notes

**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.

- 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.

# Traumatic Head Injury



**Status**
- Traumatic head injury

**Assess**
- Time critical head injury
- Other head injury
- Pupillary response

## Airway

**Action**
- 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

**Action**
- Ensure adequate ventilation and oxygenation:
  - $V_T$ 6 - 7 mL/kg
  - $SpO_2$ > 95%
  - $EtCO_2$ of 30 - 35 mmHg
- Rx causes of hypoxia and avoid hypo / hypercapnia

## Perfusion

**Action**
- **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

**Action**
- 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

## Special Notes

### 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.

- 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 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

**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

**Yes**

**Suspected SCI or Major trauma**

**Action**

- 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)**

**Isolated spinal cord injury**

**Action**

If BP < 90 mmHg:

- **Normal saline 10 mL/kg IV**

**No**

**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

**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 immobilsation required

# Spinal Injury - Neurological examination

CPG A0804

## Neurological examination for the purpose of spinal clearance

Paramedics should assess the following criteria:

| | YES | NO |
|---|---|---|
| **Motor function -** any weakness when asked to:<br>• **Arms:** Push, pull and grasp<br>• **Legs:** Push / plantar flex, pull /dorsiflex and leg raise | | |
| **Sensory function -** reduced or no sensation when applying light touch to the following:<br>• **Arms:** Palms and back of hand<br>• **Legs:** Lateral aspect of calcaneus<br>• Suprasternal notch | | |
| 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 a neurological deficit and **CANNOT** be spinally 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.

# Burns

# CPG A0805

## Special Notes

**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.

- 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**

## General Care

**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.

Key reference: www.vicburns.org.au

# Burns



**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

**If resources allow manage concurrently**

**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

# Burns



## Special Notes

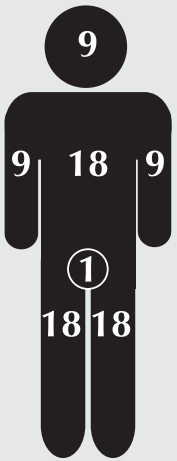
### Transport Notes

- 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.

## General Care

### 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 %



# Fracture and Dislocation Management

# CPG A0806

## Special Notes

**Care Objectives**

- 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.

# Fracture and Dislocation Management



**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 **the receiving hospital** 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

# Diving Related Emergencies

# CPG A0807

## Special Notes

- Patients with GCS < 15 and/or onset of symptoms < 10 - 15 minutes after surfacing, any seizure, LOC or altered conscious state have a higher probability of cerebral arterial gas embolism (CAGE) and are time critical. Consider air transport for these patients, preferably by helicopter at < 300 metres.
- DCI signs and symptoms may include musculoskeletal pain, itching, any neurological changes or respiratory complaint.
- Specific history is important. This should include:
  - number of dives performed
  - surface interval between dives
  - maximum depth(s) and bottom time(s)
  - type of ascent (controlled/rapid)
  - decompression or safety stops
  - breathing gas mixture used
  - level of exertion during and after dive
  - which symptoms presented and when first aid was provided.
- It is essential that any divers computers and gauges from during the dive be transported to the recompression facility.
- This CPG is for patients who have suffered a recent diving incident. Patients with a GCS of 15 who have been suffering symptoms for >12 - 24 hours before calling can be kept on a simple face mask but still need to be transported to a recompression facility with their equipment.
- At time of publication the only public recompression facility in Victoria is at the Alfred Hospital. There is also a facility at Royal Adelaide Hospital.

## General Care

- Primary goals for patients with a diving related injury are to allow **nitrogen to off-gas, increase $O_2$ delivery and rehydrate**.
- Removal of $N_2$ can be best achieved by the highest $O_2$ delivery system available.
- Unconscious and intubated patients must be ventilated using a BVM with 15 L of $O_2$ if possible. A closed $O_2$ delivery system is contraindicated for dysbaric patients.
- Extended transport times may require the oxy-saver to be connected to the D-cylinders via the adaptor hose.
- Post immersion patients can have isolated hypotension. Be aware of the potential for inadequate perfusion without hypovolaemia. Titrate fluid administration to patient response.
- Warming tissues can result in dissolved $N_2$ un-dissolving. Patients < 32ºC should be warmed to that level to avoid arrhythmia risk.
- Any potential CAGE patient must be kept supine or in the lateral position. The patient should not be allowed to sit up or stand at any time. Patients who cannot be maintained in this position due to respiratory compromise may be kept semi-recumbent.
- If there is an indication for opioid analgesia, then **consult** with the Alfred hospital before administration. Opioids may mask symptoms for the receiving physician when assessing potential recompression Rx. **Prochlorperazine** may also mask the symptom of vertigo.

# Diving Related Emergencies

# CPG A0807

**Status**

- History of recent diving incident (SCUBA)

**Assess**

- Perfusion status
- Respiratory status
- GCS
- S/S for DRE

**Stable (GCS = 15)**

- Symptomatic

**Action**

- Position Pt supine or lateral
- Mx nausea as per **CPG A0701 Nausea and Vomiting**
- Administer **Oxygen 10 - 15 L/min** via non-rebreather mask regardless of respiratory status or $SpO_2$ allowing expired air to exhaust. Maintain throughout regardless of any resolution of symptoms
- Avoid rapid increases in body temp
- Tx directly to a recompression chamber
- Mx other signs and symptoms as per appropriate CPG
- Mx as per Unstable (GCS < 15) if deterioration noted
- Hydrate Pt as per Perfusion below

**Unstable (GCS < 15)**

- Symptomatic with altered conscious state

**Action**

- Mx as per GCS 15
- Be aware of the greater potential for chest injuries and Mx as per **CPG A0802 Chest Injuries**
- Consider distance to a recompression chamber and the need for MICA and/or aeromedical Tx
- Tx directly to a recompression chamber
- Hydrate Pt as per Perfusion below
- If GCS < 10 manage as per **CPG A0302 Endotracheal intubation** as RSI Non Traumatic Brain Injury

**Perfusion**

- Dehydration
- Less than adequate perfusion

**Action**

- If adequately perfused and chest clear administer **Normal Saline 1000 mL** over **15 - 20 minutes** to rehydrate Pt. Continue **Normal Saline at 1000 mL every 4 hr**
- Less than adequate perfusion: administer ambient temperature **Normal Saline IV (max. 40 mL /kg)** titrated to patient response.
- Consult Alfred Hospital ED for further advice and fluid. If consult unavailable repeat **Normal Saline 20 mL / kg IV**



Status | Stop | Assess | Consider | Action | MICA Action

# Elderly/Frail Non-Injury Fall

# CPG A0808

## Special Notes

- 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.

# Elderly/Frail Non-Injury Fall

# CPG A0808

## Status

- Elderly or frail patient who has called AV 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 is 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?

Yes

No

## 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

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# Hypothermia / Cold Exposure

# CPG A0901

## Special Notes

- Hypothermia is insidious and rarely occurs in isolation. Where the patient is in a group other members of the group should be carefully assessed for signs of hypothermia.
- Arrhythmia in hypothermia is associated with temperatures below 33˚C.
- Atrial arrhythmias, bradycardias or A-V blocks generally resolve on rewarming. Treatment with antiarrhythmic agents is usually not required unless decompensation has occurred.
- Defibrillation and cardioactive drugs may not be effective at temp below 30˚C. VF may resolve spontaneously upon rewarming.
- The onset and duration of drugs is prolonged in hypothermia and the interval between doses is therefore doubled, e.g. doses of **Adrenaline** become 8 minutely.
- Gentle handling of the patient is essential to avoid causing arrhythmias.

## General Care

- Shelter from wind in heated environment.
- Remove all damp or wet clothing.
- Gently dry patient with towels / blankets.
- Wrap in warm sheet / blanket - cocoon.
- Cover head with towel / blanket - hood.
- Use thermal / space / plastic blankets above and below the patient if available.
- Only warm frostbite if there is no chance of refreezing prior to arrival at hospital.
- Assess BGL if altered conscious state.

**Normothermic fluid**

- Where IV fluid is indicated, **Normal Saline** warmed between 37 – 42˚C should be given to avoid worsening of hypothermia (if available).

# Hypothermia / Cold Exposure

# CPG A0901

**Status**
- Hypothermia

**Assess**
- Mild hypothermia 32 - 35˚C
- Moderate hypothermia 28 - 32˚C
- Severe hypothermia < 28˚C
- If alteration to cardiac arrest Mx required

**Non cardiac arrest**
- Moderate/severe hypothermia < 32˚C
- Normothermic **Normal Saline 10 mL/kg IV**
- Repeat **Normal Saline 10 mL/kg IV (max. 40 mL/kg)** to maintain perfusion
- Avoid drug Mx of cardiac arrhythmias unless decompensated and until rewarming has commenced

**Cardiac arrest**

**Action**
- Manage as per **CPG A0201 Cardiac Arrest** as described in Special Circumstances

# Environmental Hyperthermia Heat Stress

# CPG A0902

## Special Notes

- Patient body temperature of < 40°C may usually be managed with basic cooling techniques alone.
- Be wary of fluid volumes in renal dialysis patients causing fluid overload. Administer judicious increments with volumes not usually exceeding 10 mL/kg.
- This CPG is not intended for the management of the febrile patient due to infection.

## General Care

- During cooling, the patient should be monitored for the onset of shivering. Shivering may increase heat production and cooling measures should be adjusted to avoid its onset.
- Gentle handling of the patient is essential. Position flat or lateral and avoid head up position to avoid causing arrhythmias.

# Environmental Hyperthermia Heat Stress

# CPG A0902

**Status**
- Hyperthermia / heat stress

**Assess**
- Accurately assess temp
- BGL if altered conscious state
- Perfusion status and dehydration

**Requires active cooling**

**Action**
- Cooling techniques - initiated and maintained until temp is < 38°C
  - Shelter / remove from heat source
  - Remove all clothing except underwear
  - Ensure airflow over Pt
  - Apply tepid water using spray bottle or wet towels
- If significant dehydration or poor perfusion:
  - titrate **Normal Saline IV** to VSS and temp **(max. 40 mL/kg)**
  - Consult for further fluid. If consult unavailable repeat **Normal Saline 20 mL / kg IV**

  If Pt temp > 40°C use cool fluids if available (stored usually at < 8°C)
- Continue to administer **Normal Saline** if Pt remains poorly perfused or significantly dehydrated
  - If cool fluids intiated, return to ambient temp once Pt temp is < 39°C
- Rx low BGL as per **CPG A0702 Hypoglycaemia**
- Airway and ventilation support with 100% $O_2$ as required

**Adequate response**

**Action**
- BLS
- Tx

**Assess**
- Severe cases - temp > 39.5°C
- GCS < 10

**Action**
- Consider ETT as per **CPG A0302 Endotracheal Intubation**
- If intubated, sedation and paralysis essential to prevent shivering and reduce heat production

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# Paediatric Assessment



## Special Notes

**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.**

- 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.

## Special Notes

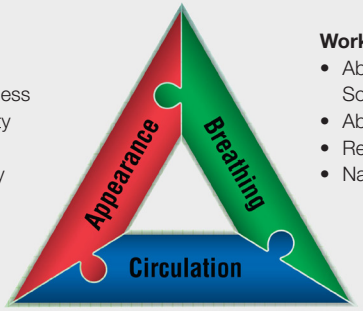
- The RCH will accept any patient up to and including the age of 15 years and is the destination of choice for trauma and burns in this age range. If the patient has a relevant past history at RCH, they will accept patients up to and including the age of 18 years.
- If the management recommended in these 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



## PAEDIATRIC ASSESSMENT TRIANGLE

**Appearance**
- Tone
- Interactiveness
- Consolability
- Look/Gaze
- Speech/Cry




**Work of Breathing**
- Abnormal Breath Sounds
- Abnormal Positioning
- Retractions
- Nasal Flaring

**Circulation to the Skin**
- Pallor
- Mottling
- Cyanosis

### Special Notes

- 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.

| Criteria | Well Child | Unwell Child |
|---|---|---|
| • **Tone** | • active, reaching, moving, strong grip | • still, floppy, quiet |
| • **Interactivity** | • interested in the environment, looking, smiling | • not interested in their surroundings |
| • **Consolability** | • easily comforted/consoled | • inconsolable |
| • **Look/gaze** | • looks at caregivers or items of interest | • staring, not engaging in eye contact |
| • **Speech/cry** | • cries | • moaning, grunting or quiet |

Adapted from "Detect Junior: The Paediatric Approach", Clinical Excellence Commission NSW, 2012

## Normal Values

| Paediatric definitions | |
|---|---|
| **Nomenclature** | **Age** |
| Newborn | Birth to 24 hours |
| Small infant | Under 3 months |
| Large infant | 3 – 12 months |
| Small child | 1 – 4 years |
| Medium Child | 5 – 11 years |

**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:**

| Age | Weight |
|---|---|
| < 24 hours | 3.5 kg |
| 3 months | 6 kg |
| 6 months | 8 kg |
| 1 year | 10 kg |
| 1 - 9 years | Age x 2 + 8 kg |
| 10 - 11 years | Age x 3.3 kg |

# Paediatric Perfusion



## Normal Values

**Normal blood volume**
Newborn – 80 mL/kg
Infant and child – 70 mL/kg

**Adequate perfusion**

| Age | HR | BP |
|---|---|---|
| Newborn | 110 – 170 bpm | > 60 mmHg systolic |
| Small infant | 110 – 170 bpm | > 60 mmHg systolic |
| Large Infant | 105 – 165 bpm | > 65 mmHg systolic |
| Small child | 85 – 150 bpm | >70 mmHg systolic |
| Medium child | 70 – 135 bpm | > 80 mmHg systolic |

**Skin** – warm, pink and dry.

**Conscious state** – alert and active.

## Abnormal Medical Values

**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.**

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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/** (accessed 15/04/2015)

# Paediatric Respiratory



## Normal Values

### Normal respiratory rates

| Age | RR |
|---|---|
| Newborn | 25 – 60 breaths/minute |
| Small infant | 25 – 60 breaths/minute |
| Large Infant | 25 – 55 breaths/minute |
| Small child | 20 – 40 breaths/minute |
| Medium child | 16 – 34 breaths/minute |

## 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.**

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- 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 above 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/** (accessed 15/04/2015)

# Paediatric Conscious State



## 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

### Child ≤ 4 years

| Eye opening |
|---|
| Spontaneous – 4 |
| To voice – 3 |
| To pain – 2 |
| None – 1 |
| **Verbal response** |
| Appropriate words/social smile – 5 |
| Cries but consolable – 4 |
| Persistently irritable – 3 |
| Moans to pain – 2 |
| None – 1 |
| **Motor response** |
| Spontaneous – 6 |
| Localises to pain – 5 |
| Withdraws from pain – 4 |
| Abnormal flexion to pain – 3 |
| Abnormal extension to pain – 2 |
| None – 1 |

### Child > 4 years

| Eye opening |
|---|
| Spontaneous – 4 |
| To voice – 3 |
| To pain – 2 |
| None – 1 |
| **Verbal response** |
| Orientated – 5 |
| Confused – 4 |
| Inappropriate words – 3 |
| Incomprehensible sounds – 2 |
| None – 1 |
| **Motor response** |
| Obeys command – 6 |
| Localises to pain – 5 |
| Withdraws from pain – 4 |
| Abnormal flexion to pain – 3 |
| Abnormal extension to pain – 2 |
| None – 1 |

# Paediatric Pain Assessment



- 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.

# Paediatric Pain Assessment



| The FLACC scale | 0 points | 1 point | 2 points |
|---|---|---|---|
| **Face** | No particular expression or smile | Occasional grimace or frown, withdrawn, disinterested | Frequent to constant frown, clenched jaw, quivering chin |
| **Legs** | Normal position or relaxed | Uneasy, restless, tense | Kicking or legs drawn up |
| **Activity** | Lying quietly, normal position, moves easily | Squirming, shifting back and forth, tense | Arched, rigid or jerking |
| **Cry** | No cry (awake or asleep) | Moans or whimpers, occasional complaints | Crying steadily, screams or sobs, frequent complaints |
| **Consolability** | Content, relaxed | Reassured by occasional touching, hugging, or being spoken to, distractible | Difficult to console or comfort |

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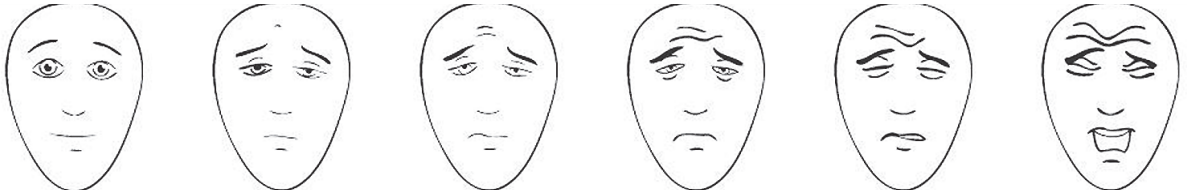
# Paediatric Pain Assessment



## 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.*

**Reference:** Hicks CL, et al. The Faces Pain Scale - Revised: Toward a common metric in pediatric pain measurement. Pain 2001; 93:173-183.

### 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 Charts

# CPG P0102

## Paediatric Chart

| Age | | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg |
| Resps | Normal lower limit | 25 | 25 | 25 | 20 | 20 | 20 | 20 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | /minute |
| Resps | Normal upper limit | 60 | 60 | 55 | 40 | 40 | 40 | 40 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | /minute |
| | | | | | | | | | | | | | | | | |
| Pulse | Normal lower limit | 110 | 110 | 105 | 85 | 85 | 85 | 85 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | /minute |
| Pulse | Normal upper limit | 170 | 170 | 165 | 150 | 150 | 150 | 150 | 135 | 135 | 135 | 135 | 135 | 135 | 135 | /minute |
| | | | | | | | | | | | | | | | | |
| SBP | Normal lower limit | 60 | 60 | 65 | 70 | 70 | 70 | 70 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | mmHg |
| | | | | | | | | | | | | | | | | |
| ETT | Internal diameter | 3.5 | 3.5 | 3.5 | 4.0 | 4.5 | 5.0 | 5.0 | 5.5 | 5.5 | 6.0 | 6.0 | 6.5 | 6.5 | 7.0 | mm |
| ETT | Length at lips | 9.5 | 9.5 | 11 | 12 | 13 | 13.5 | 14 | 14.5 | 15 | 15.5 | 16 | 16.5 | 17 | 17.5 | cm |
| | | | | | | | | | | | | | | | | |
| Naso/Orogastric Tube | | 6-8 | 12 | 12 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | FG |
| Suction Catheter for ETT | | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | FG |
| | | | | | | | | | | | | | | | | |
| DCCS (Biphasic) | 4 joules/kg | 15 | 20 | 30 | 50 | 50 | 70 | 70 | 100 | 100 | 100 | 100 | 120 | 150 | 150 | joules |

# Paediatric Charts



## Resuscitation drugs

| Age | | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs | Guideline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg | |
| **Adrenaline 1:1,000** | **neb.** | For all ages add 5 mL to nebuliser | | | | | | | | | | | | | | | Upr airway oedema |
| **Adrenaline 1:1,000** | **10 mcg/kg** | 0.1* | 0.1* | 0.1* | 0.1* | 0.12 | 0.14 | 0.16 | 0.18 | 0.2 | 0.22 | 0.24 | 0.26 | 0.33 | 0.36 | mL | ALS anaphylaxis, asthma |
| | | 100 | 100 | 100 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 330 | 360 | mcg | |
| 1 mg/1 mL (1 mg = 1 mL) | | 1 mL syringe | | | | | | | | | | | | | | | |
| **Adrenaline 1:1,000** | **10 mcg/kg** | use 1:10,000 | | | 0.1 | 0.12 | 0.14 | 0.16 | 0.18 | 0.2 | 0.22 | 0.24 | 0.26 | 0.33 | 0.36 | mL | MICA anaphylaxis, asthma |
| | | 35 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 330 | 360 | mcg | |
| 1 mg/1 mL (1 mL = 1 mg) | | 1 mL syringe | | | | | | | | | | | | | | | |
| **Adrenaline 1:10,000** | **10 mcg/kg** | 0.35 | 0.6 | 0.8 | 1 | 1.2 | 1.4 | 1.6 | 1.8 | 2 | 2.2 | 2.4 | 2.6 | 3.3 | 3.6 | mL | MICA anaphylaxis, cardiac arrest, asthma |
| | | 35 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 330 | 360 | mcg | |
| 1 mg/10 mL (1 mL = 100 mcg) | | 1 mL syringe | | | | 10 mL syringe | | | | | | | | | | | |
| **Sodium Bicarbonate 8.4%** | **2 mL/kg** | 7 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 66 | 72 | mL | Cardiac arrest (TCA OD or hyperkalaemia), TCA OD |
| | | 50 mL Minijet syringe | | | | | | | | | | | | | | | |
| **Amiodarone** | **5 mg/kg** | 1.75 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Different dilution suggested for > 6 yr. | | | | | mL | VF/ VT arrest |
| 100 mg/10 mL (See across for dilution info) (1 mL = 10 mg) | | 17.5 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | | | | | | mg | |
| | | Dilution info: Add 2 mL (100 mg) Amiodarone (from 150 mg in 3 mL ampoule) to 8 mL Dextrose in a 10 mL syringe | | | | | | | | | | | | | | | |
| **Amiodarone** | **5 mg/kg** | Different dilution suggested for ≤ 6 yr. | | | | | | | | | 2.2 | 2.4 | 2.6 | 3.3 | 3.6 | mL | VF/ VT arrest |
| | | | | | | | | | | | 110 | 120 | 130 | 165 | 180 | mg | |
| 150 mg/3 mL (1 mL = 50 mg) | | 10 mL syringe | | | | | | | | | | | | | | | |
| Syringe Scales | | 1 mL/0.01 mL increments | | | | | 2.5 mL/0.1 mL increments | | | | | | 10 mL/0.2 mL increments increments | | | 50 mL/1 mL | |

*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 × required dose.

# Paediatric Charts

# CPG P0102

## Ceftriaxone and Dextrose

| Age | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs | Guideline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg | |
| **Ceftriaxone (IM) 50 mg/kg** | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4 | 4 | 4 | 4 | 4 | mL | Meningococcal septicaemia |
| 1 g diluted with 3.5 mL 1% Lignocaine (1 mL = 250 mg) | 175 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | mg | |
| | 1 mL syringe | 2.5 mL syringe | | | | 10 mL syringe | | | | | | | | | | |
| **Ceftriaxone (IV) 50 mg/kg** | 1.75 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | mL | Meningococcal septicaemia |
| 1 g diluted with 9.5 mL Water for Injection (1 mL = 100 mg) | 175 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | mg | |
| | 10 mL syringe | | | | | | | | | | | | | | | |
| **Dextrose 10% 3 mL/kg** | 10 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 78 | 99 | 108 | mL | Hypoglycaemia |
| **2 mL/kg** | 7 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 66 | 72 | mL | |
| | 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

| Age | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs | Guideline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg | |
| **Fentanyl (IV) 2 mcg/kg**<br>100 mcg/10 mL (1 mL = 10 mcg) | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4.4 | 4.8 | 5.2 | 6.6 | 7.2 | mL | Emergency sedation |
| | 7 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 66 | 72 | 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) 0.1 mg/kg**<br>15 mg/15 mL (1 mL = 1 mg) | 0.35 | 0.6 | 0.8 | 1 | 1.2 | 1.4 | 1.6 | 1.8 | 2 | 2.2 | 2.4 | 2.6 | 3.3 | 3.6 | mL | Post - ETT sedation |
| | 0.35 | 0.6 | 0.8 | 1 | 1.2 | 1.4 | 1.6 | 1.8 | 2 | 2.2 | 2.4 | 2.6 | 3.3 | 3.6 | mg | For induction doses, see CPG P0301 |
| | 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) 0.25 mg/kg**<br>200 mg/20 mL (1 mL = 10 mg) | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 0.5 | 0.6 | 0.6 | 0.8 | 0.9 | mL | Extreme traumatic pain |
| | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 8 | 9 | mg | |
| | Add 2 mL (200 mg) Ketamine to 18 mL Normal Saline in 20 mL syringe | | | | | | | | | | | | | | | |
| **Morphine (IM) 0.1 mg/kg**<br>10 mg/1 mL (1 mL = 10 mg) | 0.035 | 0.06 | 0.08 | 0.1 | 0.12 | 0.14 | 0.16 | 0.18 | 0.2 | 0.22 | 0.24 | 0.26 | 0.33 | 0.36 | mL | Pain relief |
| | 0.35 | 0.6 | 0.8 | 1 | 1.2 | 1.4 | 1.6 | 1.8 | 2 | 2.2 | 2.4 | 2.6 | 3.3 | 3.6 | mg | |
| | 1 mL syringe | | | | | | | | | | | | | | | |
| | CAUTION IM Morphine dose should never exceed 0.5mL | | | | | | | | | | | | | | | |
| **Naloxone (IM) 10 mcg/kg**<br>400 mcg/1 mL (1 mL = 400 mcg) | n/a | 0.15 | 0.2 | 0.25 | 0.3 | 0.35 | 0.4 | 0.45 | 0.5 | 0.55 | 0.6 | 0.65 | 0.825 | 0.9 | mL | Opioid overdose |
| | n/a | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 330 | 360 | mcg | |
| | 1 mL syringe | | | | | | | | | | | | | | | |

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.

# Paediatric Charts

# CPG P0102

## Normal Saline and Dexamethasone

| Age | | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs | Guideline |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg | |
| **Normal Saline** | **20 ml/kg** | 70 | 120 | 160 | 200 | 240 | 280 | 320 | 360 | 400 | 440 | 480 | 520 | 660 | 720 | mL | Hypovolaemia, asthma, cardiac arrest, anaphylaxis |
| | | Use a 50 mL syringe or infusion depending on volume to be delivered | | | | | | | | | | | | | | | |
| **Dexamethasone** | **600 mcg/kg** | 0.52 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 | 2.7 | 3 | 3 | 3 | 3 | 3 | 3 | mL | Asthma (MICA), croup (ALS) |
| 8 mg in 2 mL (1 mL = 4 mg) | | 2.1 | 3.6 | 4.8 | 6 | 7.2 | 8.4 | 9.6 | 10.8 | 12 | 12 | 12 | 12 | 12 | 12 | mg | |
| | | 1 mL syringe | | | 2.5 mL syringe | | | | 5 mL syringe | | | | | | | | |

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.

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# Time Critical Guidelines (Trauma Triage)

CPG P0105

## Pre-Hospital Vital Signs Major Truama 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):**

| Age | 0 – 3 months | 4 – 12 months | 1 – 4 years | 5 – 11 years |
|---|---|---|---|---|
| HR | <100 or >180 | <100 or >180 | <90 or >160 | <80 or >140 |
| RR | >60 | >50 | >40 | >30 |
| Syst BP | <50 mmHg | < 60 mmHg | <70 mmHg | < 80 mmHg |
| $SpO_2$ | < 90% | | | |
| GCS | <15 (or less than Alert on AVPU) | | | |

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

Yes ····► **Transport to the highest level of trauma service within 45 minutes travel**

No

**Assess patient for specific injuries**

## 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 spinal 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?**

Yes ·····► **Transport to the highest level of trauma service within 45 minutes travel**

# Time Critical Guidelines (Trauma Triage)



No

**Assess patient against high risk criteria for major trauma**

**High Risk Criteria for Major Trauma**

**Assess for mechanism of injury:**
- Motor / cyclist impact > 30kph
- High speed MCA > 60kph
- Pedestrian impact
- Ejection from vehicle
- Prolonged extrication
- Fall from height > 3m
- Struck on head by object falling > 3m
- Explosion

**Does the patient meet the high risk criteria?**

Yes → **Transport to the highest level of trauma service within 45 minutes travel**

No

**Transport to the nearest appropriate emergency care facility**

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# Cardiac Arrest (Paediatric)

CPG P0201

## Traumatic Cardiac Arrest

### 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
- 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

## 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**

## Medical Cardiac Arrest

### Care Objectives

- **Effective airway control** and **adequate ventilation with oxygen** is the cornerstone of paediatric resuscitation
- 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 $EtCO_2$
- When **ETT** is attempted, it should not interrupt compressions
- **$EtCO_2$**
  - 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

# Cardiac Arrest (Paediatric)



## Special 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

## Special Notes

**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

# Cardiac Arrest - Medical (Paediatric)



**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 $ETCO_2$ monitoring & insert OG tube

Status | Stop | Assess | Consider | Action | MICA Action

# Cardiac Arrest – Trauma (Paediatric)



**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**.

# Cardiac Arrest ROSC Management (Paediatric)



**Status**

- Post cardiac arrest

**Intubation/ventilation**

**Action**

- Consider ETT as per **CPG P0301 Endotracheal Intubation (Paediatric)** if not already intubated
- Maintain ETT as per **P0301 Endotracheal Intubation (Paediatric)**
- Target $ETCO_2$ 30-40mmHg Ventilate 10 mL/kg

**Perfusion Mx**

**Action**

- 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

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# Endotracheal Intubation (Paediatric) Guide



## Special Notes

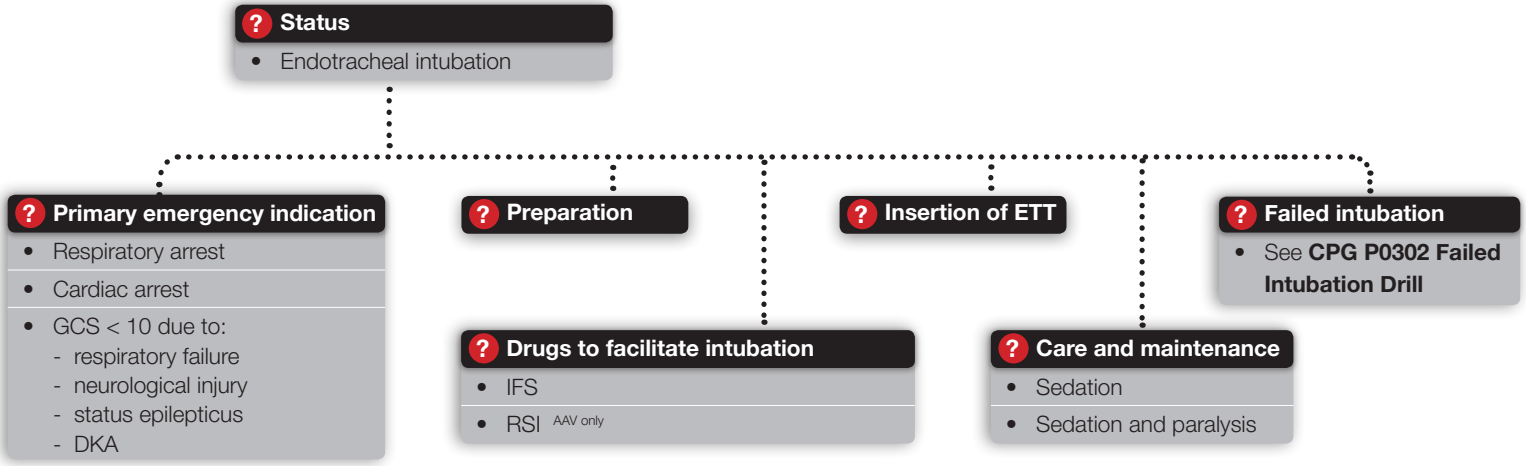
- The Medical Advisory Committee has authorised paediatric endotracheal intubation by MICA Paramedics in selected patients.
- There are two intubation techniques available:
  - Intubation without drugs (unassisted endotracheal intubation)
  - IFS

  The appropriate technique will vary according to the clinical setting and the Paramedic's authorised scope of practice.
- A MICA Paramedic operating alone may elect not to use IFS until a second MICA Paramedic is present.
- All intubations facilitated or maintained with drug therapy will be reviewed as part of AV's clinical governance processes.

## General Care

# Endotracheal Intubation (Paediatric) Guide





# Endotracheal Intubation (Paediatric) Indications, Precautions, C/Is CPG P0301

## Special Notes

- **Status epilepticus**
  - A continuous or recurrent seizure of > 5 minutes duration or no return of consciousness between seizures may require intubation where there is airway / ventilation compromise that cannot be managed effectively using an OPA and BVM.
- **Neurological Injury**
  - RSI should not be performed in the paediatric patient except by AAV.

## General Care

# Endotracheal Intubation (Paediatric) Indications, Precautions, C/Is CPG P0301

## Unassisted Endotracheal Intubation

**Indication**

- **Respiratory arrest**
- **Cardiac arrest**
- **Absent airway reflexes**

**General Precautions**

- Consider time to intubation at hospital versus time to intubate at scene
- An Advanced Care Plan in a Pt with severe pre-existing neurological disability may specify Pt 'Not for Intubation'

## IFS

**Indication – GCS < 10 with intact airway reflexes**

- **Respiratory failure**
  - Unresponsive to non invasive ventilation and drug therapy
- **DKA**
  - DKA with BGL reading 'High'
- **Respiratory impairment post immersion / submersion**
- **Brief cardiac arrest**
- **Status epilepticus**

**Precautions for IFS**

- As per General Precautions
- Anticipation of difficulty with BVM ventilation
- Anticipation of a difficult intubation, e.g. upper airway obstruction, facial trauma
- In general if Tx time < 10 minutes then no IFS

**Contraindication**

- Clinical situations where failed intubation drill would not be feasible such as upper airway obstruction
- No functional electronic capnograph
- Coma due to neurological injury (TBI, intracranial haemorrhage)

## RSI

**Contraindication**

- RSI not approved for use by MICA Paramedics in paediatric Pts

# Endotracheal Intubation (Paediatric) Preparation



## Special Notes

| Age | Endotracheal tube size | Length at lips |
|---|---|---|
| 1 month | 3.5 mm | 9.5 cm |
| 6 months | 3.5 mm | 11 cm |
| 12 months | 4 mm | 12 cm |
| > 12 months | Age/4 + 4 mm | Age/2 + 12 cm |

1. Children under 3.0kg or premature babies should be intubated with a size 2.5mm or 3.0mm uncuffed ETT as per **CPG N0201 Newborn Resuscitation**.
2. For ETT sizing, refer to the manufacturers sizing chart (cuffed) or to the paediatric table (uncuffed). The correct size uncuffed ETT may allow a small leak around the ETT with positive pressure but not so great as to make ventilation inadequate. A closer fitting ETT may be necessary for stiff lungs, e.g. respiratory impairment post immersion / submersion.
3. 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 – 25mmHg using the manometer to do so. Inflating the cuff first and then checking the pressure afterwards is not accepted practice.
4. If AS markings are present, these can assist in identifying the correct tube length.

## Special Notes

**ETT suction (Paediatric)**

This may be necessary to remove tracheal secretions or aspirated material:

| Suction catheter size | ETT size |
|---|---|
| 6 FG | 3 - 3.5 mm ETT |
| 8 FG | 4 - 5.5 mm ETT |
| 10 FG | 6 mm ETT |

# Endotracheal Intubation (Paediatric) Preparation



## Unassisted endotracheal intubation

**? General preparation for intubation**

**✔ Action**

- Position Pt. If a cervical collar is fitted it should be opened while maintaining manual cervical support
- Pre-oxygenate with 100% $O_2$ and electronic capnograph attached
- Ensure pulse oximeter and cardiac monitor are functional
- Prepare equipment and assistance
  - Suction
  - ETT (plus one size **smaller** and one size **larger** than predicted immediately available) with introducer
  - Ensure equipment for a difficult / failed intubation is immediately available, including bougie, LMA, cricothyroidotomy kit
  - Mark cricothyroid membrane as necessary
  - Brief assistant to provide cricoid pressure, where appropriate
  - If suspected spinal injury, where possible a second assistant should be available to stabilise the head and neck
- Ensure functional and secure IV access

## IFS

**? Preparation for IFS**

**✔ Action**

- As per General preparation for intubation
- Prehydrate with **Normal Saline 10 mL/kg IV** bolus unless APO
- If Pt hypotensive and/or tachycardic, follow relevant CPG in conjunction with the intubation process
- Draw up and label drugs as appropriate

## RSI

**Contraindication**

- RSI not approved for use by road MICA Paramedics in paediatric Pts

# Endotracheal Intubation (Paediatric) Drugs



## IFS Drug Doses

| Age | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | Kg |
| **Fentanyl (IV) 2 mcg/kg** 100 mcg/10 mL (1 mL = 10 mcg) | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4.4 | 4.8 | 5.2 | 6.6 | 7.2 | mL |
| | 7 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 66 | 72 | mcg |
| | Add 2 mL (100 mcg) Fentanyl (from 100 mcg in 2 mL ampoule) to 8 mL Normal Saline in a 10 mL syringe | | | | | | | | | | | | | | |

## IFS Drug Doses

| Age | 0 | 3 Mth | 6 Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | Kg |
| **Midazolam (IV) 0.2 mg/kg** 15 mg/15 mL (1 mL = 1 mg) | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4.4 | 4.8 | 5.2 | 6.6 | 7.2 | mL |
| | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4.4 | 4.8 | 5.2 | 6.6 | 7.2 | mg |
| | Add 3 mL (15 mg) Midazolam (from 15 mg in 3 mL ampoule) to 12 mL Normal Saline in a 20 mL syringe | | | | | | | | | | | | | | |

# Endotracheal Intubation (Paediatric) Drugs



## Unassisted endotracheal intubation

**Action**

- Proceed with intubation
  - no drugs required

## IFS

**Sedation required**

**Action**

- **Fentanyl 2 mcg/kg IV**
- **Midazolam 0.2 mg/kg IV**
- If unable to administer Fentanyl **Morphine 0.2 mg/kg IV**

**If 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 Failed Intubation Drill**

## RSI

**Contraindication**

- RSI not approved for use by road MICA Paramedics in Paediatric Pts

# Endotracheal Intubation Insertion (Paediatric)



## Insertion of endotracheal tube

- Observe passage of ETT through the cords. If AS markings are present, these can assist in identifying the correct tube length. Note the grade of view.
- Inflate cuff (if applicable).
- **Confirm tracheal placement via capnometry. If capnography or colourimetric $CO_2$ detection is negative (including patients in cardiac arrest), the ETT must be removed.**
- Note length of ETT at lips/teeth.
- Auscultate chest/epigastrium.
- Note supplemental cues of correct placement (e.g. tube misting, bag movement in the spontaneously ventilating Pt, improved $SpO_2$ and colour).
- Secure the ETT and insert a bite block if required.
- **If there is ANY doubt about tracheal placement the ETT must be removed.**
- If unable to intubate after ensuring correct technique and problem solving then proceed to **CPG P0302 Failed Intubation Drill**.

## General care of the intubated patient

- Cervical collars should be placed on all intubated children over the age of 4 years where practicable.
- Re-confirm tracheal placement after every patient movement using $EtCO_2$. Disconnect and hold ETT during all transfers.
- If electronic capnography fails after intubation, use colourimetric capnometry.
- Suction ETT and oropharynx in all patients.
- Childrens stomachs are easily inflated. Insertion of an OG or NG tube may decrease splinting of the diaphragm and improve ventilation.
- Ventilate using 100% $O_2$ and Tidal Volume of 10 mL/kg. Aim to maintain $SpO_2$ > 95% and $EtCO_2$ at 30 - 35 mmHg (except asthma where a higher $EtCO_2$ may be permitted; TCA OD where the target is 20 - 25 mmHg; and DKA where the $EtCO_2$ should be maintained at the level detected immediately post-intubation, with a **maximum** of 25 mmHg).
- Document all checks and observations made to confirm correct ETT placement.

# Endotracheal Intubation Insertion (Paediatric)



**Status**

- Insertion/general care of ETT
  - Unassisted endotracheal intubation
  - IFS
  - RSI [AAV]

**Insertion and checks of ETT**

**Action**

- Capnography – $EtCO_2$
- Length at lips / teeth
- If cuffed ETT, check cuff pressure aiming for 20 - 25 mmHg
- Auscultate chest / epigastrium
  - Chest rise and fall, bag movement, $SpO_2$, colour, tube misting
- Specific insertion instructions as per Insertion of **endotracheal tube**

**If capnography or colourimetric $CO_2$ detection is negative (including Pts in cardiac arrest), the ETT must be removed.**

**If there is ANY doubt about tracheal placement the ETT must be removed.**

**General care / ventilation**

**Action**

- ETT checks with each Pt movement
- Provide circulatory support if hypotension present
- Use colourimetric capnometry if capnography fails
- Suction ETT and oropharynx
- Insert OG / NG tube
- Ventilate $V_T$ 10 mL/kg, $EtCO_2$ 30 - 35 mmHg if appropriate to Pt condition
- Disconnect and hold ETT during transfers
- Specific instructions as per **General care of the intubated patient**

# Endotracheal Intubation (Paediatric) Care and Mx of Intubated Pt CPG P0301

## Special Notes

- For the patient who becomes hypotensive after intubation, consider reducing the dose of sedation in association with additional fluid according to the clinical setting.

## General Care

- **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
- **Fentanyl** + **Midazolam Infusion** (Paediatric)
  - **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**

# Endotracheal Intubation (Paediatric) Care and Mx of Intubated Pt CPG P0301

**Status**
- Intubated Pt

**Consider**
- If Pt requires sedation or sedation / paralysis to maintain ETT and ventilation

**Post intubation sedation**
- Restlessness / signs of under sedation in the absence of other noxious stimuli
  - e.g. ETT too deep / irritating, occult pain
- Signs of inadequate sedation

| Non paralysed Pt | Paralysed Pt |
|---|---|
| - as per Paralysed Pt<br>- cough / gag / movement | - HR and BP trending up together<br>- lacrimation<br>- diaphoresis |

**Sedation**

**Action**
- **Morphine / Midazolam infusion**
  **0.1 - 0.2 mL/kg/hr IV**
  - Repeat **0.1 mg/kg IV** boluses as required

**OR**
- **Fentanyl / Midazolam infusion**
  **0.1 - 0.2 mL/kg/hr IV**
- Until **Morphine / Midazolam infusion** established:
  - **Midazolam 0.1 mg/kg IV** as required **or**
  - **Midazolam / Morphine 0.1 mg/kg IV** each drug

**Post intubation paralysis - consult only**
- Where sedation alone is ineffective at maintaining ETT or allowing adequate ventilation / oxygenation
- As prescribed for interhospital transfer

**Stop**
- All Pts receiving paralysis MUST receive ongoing sedation
- The ETT must be secured and tracheal placement re-confirmed with electronic capnography
- C/I for Pt in status epilepticus

**Sedation and paralysis**

**Action**
- Sedate as per Post intubation sedation
- **Rocuronium 0.6 mg/kg IV - at 15 minute intervals (consult only)**
  - Repeat if evidence of returning muscular activity

# Failed Intubation Drill (Paediatric)



## Special Notes

- Paediatric i-gel insertion is for MICA only.
- If cricothyroidotomy is required for children under the age of 12 years then needle cricothyroidotomy should be performed and jet ventilation administered.
- The use of cricothyroidotomy without consultation is restricted to MICA Paramedics specifically accredited in this skill.

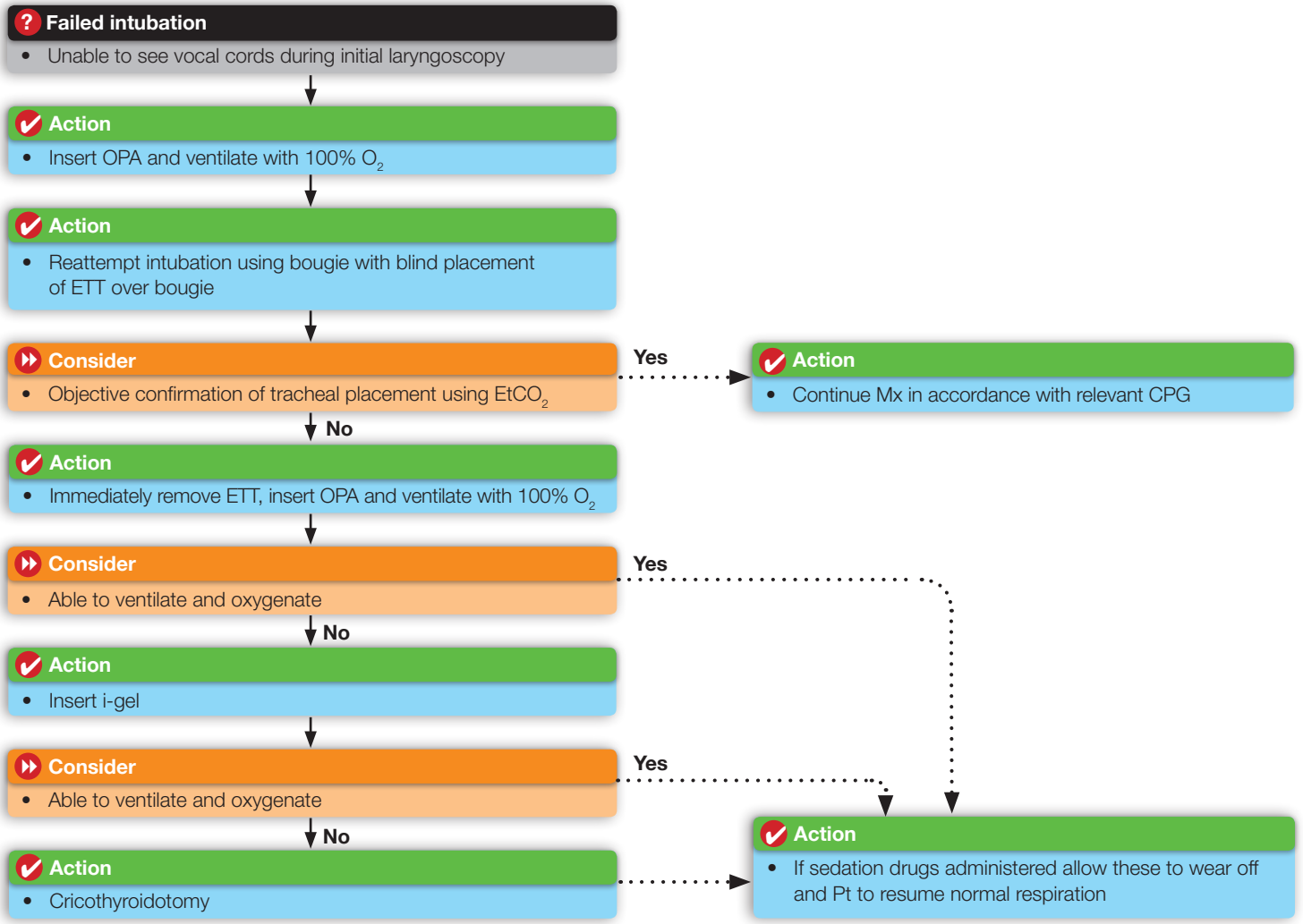
## i-gel quick reference guide

| i-gel size | Pt weight guide* | Max size of gastric tube |
|---|---|---|
| 1.0 | 2 – 5 kg | N/A |
| 1.5 | 5 – 12 kg | 10 |
| 2.0 | 10 – 25 kg | 12 |
| 2.5 | 25 – 35 kg | 12 |
| 3.0 | 30 – 60 kg | 12 |
| 4.0 | 50 – 90 kg | 12 |
| 5.0 | 90+ kg | 14 |

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

# Failed Intubation Drill (Paediatric)





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# Pain Relief (Paediatric)



## Special Notes

### Care objectives

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

- 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 fentanyl IN and the IV route is unavailable. Unless the patient is heavier than their age-calculated weight, the maximum dose should not exceed 5 mg.
- 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.

## General Care

- 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 | | | |
|---|---|---|---|
| **Age (years)** | **Weight (kg)** | **Dose (mg)** | **Volume (nearest mL)** |
| 3 month | 6 | 90 | 4 |
| 6 month | 8 | 120 | 5 |
| 1 year | 10 | 150 | 6 |
| 2 | 12 | 180 | 8 |
| 3 | 14 | 210 | 9 |
| 4 | 16 | 240 | 10 |
| 5 | 18 | 270 | 11 |
| 6 | 20 | 300 | 13 |
| 7 | 22 | 330 | 14 |
| 8 | 24 | 360 | 15 |
| 9 | 26 | 390 | 16 |
| 10 | 33 | 495 | 21 |
| 11 | 36 | 540 | 23 |

NB. Children aged 10 - 11 can have a single 500mg tablet as an alternative to the liquid preparation depending on patient preference.

# Pain Relief (Paediatric)



## 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

### Action

- 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 – 39 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

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# Upper Airway Obstruction (Paediatric)



## Special Notes

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.

## General Care

# Upper Airway Obstruction (Paediatric)



**Status**
- Suspected upper airway obstruction

**Newborns: not recommended for this guideline. Use suctioning as per CPG N0101.**

**Assess**
- Identify possible cause

**Partial obstruction**
- Effective cough

**Action**
- Passive techniques
  - Encourage cough
  - Utilise gravity
  - Maintain BLS

**Partial obstruction**
- Ineffective cough

**Action**
- Use manual techniques as required:
  - Utilise gravity
  - Back slaps alternating with chest thrusts
- **IF** unconscious or becomes unconscious
  - Chest compressions
  - Suction
  - Magill's forceps
  - Forced ventilation
- **IF** loss of C.O.
  - Mx as per **CPG P0201 Cardiac Arrest**

**Croup**

**Action**
- See **CPG P0601**

**Suspected epiglottitis**

**Do not inspect airway**

**Action**
- BLS
- Tx

# Upper Airway Obstruction (Paediatric)



## Special Notes

- 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**

| | Mild | Moderate | Severe |
|---|---|---|---|
| Behaviour | Normal | Some/ intermittent irritability | Increasing irritability and/ or lethargy |
| Stridor | Barking cough. Stridor only when active or upset. | Some stridor at rest | Stridor present at rest |
| Respiratory Rate | Normal | Increased resp. rate Tracheal tug Nasal flaring | Marked increase or decrease in RR Tracheal Tug Nasal flaring |
| Accessory Muscle Use | None or minimal | Moderate chest wall retraction | Marked chest wall retraction |
| Oxygen | No oxygen requirement | No oxygen requirement | Hypoxaemia (late sign) |

# Upper Airway Obstruction (Paediatric)



**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**
- Either:
  - Increasing respiratory distress
  - Increasing lethargy
  - Decreasing stridor

**Action**
- **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

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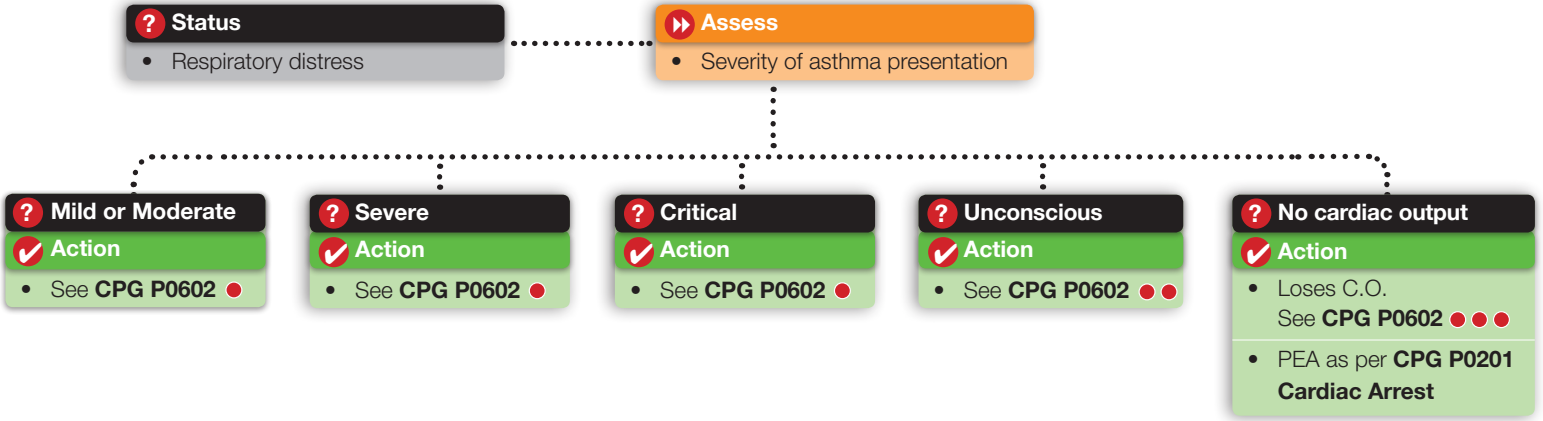
# Asthma (Paediatric)

## CPG P0602



# Asthma (Paediatric)



## Special Notes

- 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 $SpO_2$ 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 **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 **Salbutamol** to children as it can cause profound lactic acidosis. Nebulised **Salbutamol** should be reserved for severely ill children.
- Children under 2 years of age should not be treated with nebulised **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.
- Assess severity as follows. Vital signs can vary significantly depending on the age of the child.

**Mild/Moderate:** Normal conscious state, some increased work of breathing, tachycardia, speaking in phrases/ sentences.

**Severe:** Agitated/distressed, markedly increased work of breathing, including accessory muscle use/retraction, tachycardia, speaking in words.

**Critical:** Altered conscious state, maximal work of breathing, marked tachycardia, unable to talk.

## General Care

- 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 as to the most effective route of administration.
- 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** as per Severe respiratory distress.

# Asthma (Paediatric)



**Status**
- Respiratory distress

**Assess**
- Severity of distress

**Mild or Moderate**

**Action**
- **Salbutamol pMDI** and spacer
  - **≥ 6 years** **Salbutamol 4 - 12 doses**
  - **2 - 6 years** **Salbutamol 2 - 6 doses**
  - Pt to take **4 breaths** for each dose
  - Repeat **at 20 minute intervals** 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 intervals** 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 0.05 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

# Asthma (Paediatric)



## Special Notes

- 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 Care

# Asthma (Paediatric)



**Status**

- Unconscious / becomes unconscious with poor or no ventilation but still with C.O.

**Pt requires immediate assisted ventilation**

**Immediate action**

- Ventilate at: - **Small child 12 - 15 ventilations/minute**
  - **Medium child 10 - 14 ventilations/minute**

  Use $V_T$ sufficient to achieve visible rise and fall of chest.
- Moderately high respiratory pressures
- Allow for prolonged expiratory phase
- Gentle lateral chest pressure during expiration

**Adequate response**

**Action**

- Rx as per Critical asthma

**Inadequate response**

**Action**

- Rx as per Critical asthma
- Consider intubation per **CPG P0301 Endotracheal Intubation**

**If Pt loses C.O. at any stage see CPG P0602 ●●●**

# Asthma (Paediatric)



## Special 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.

## General Care

# Asthma (Paediatric)



**Status**

- Pt loses C.O.

**Pt requires immediate intervention**

**Action**

- **Apnoea 30 sec**
  - Exclude TPT
  - Gentle lateral chest pressure
  - Prepare for potential resuscitation

**C.O. returns**

**Action**

- Treat as per **CPG P0602**

**Carotid pulse, no BP**

**Action**

- **Adrenaline 10 mcg/kg IV**
  - Repeat **10 mcg/kg IV at 5 minute intervals** as required
- **Normal Saline 20 mL/kg IV**

**No return of C.O.**

**Action**

- Mx as per appropriate **CPG P0201 Cardiac Arrest - Medical**

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# Nausea and Vomiting (Paediatric)



## Special Notes

- 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

# Nausea and Vomiting (Paediatric)



**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**

# Hypoglycaemia (Paediatric)



## Special Notes

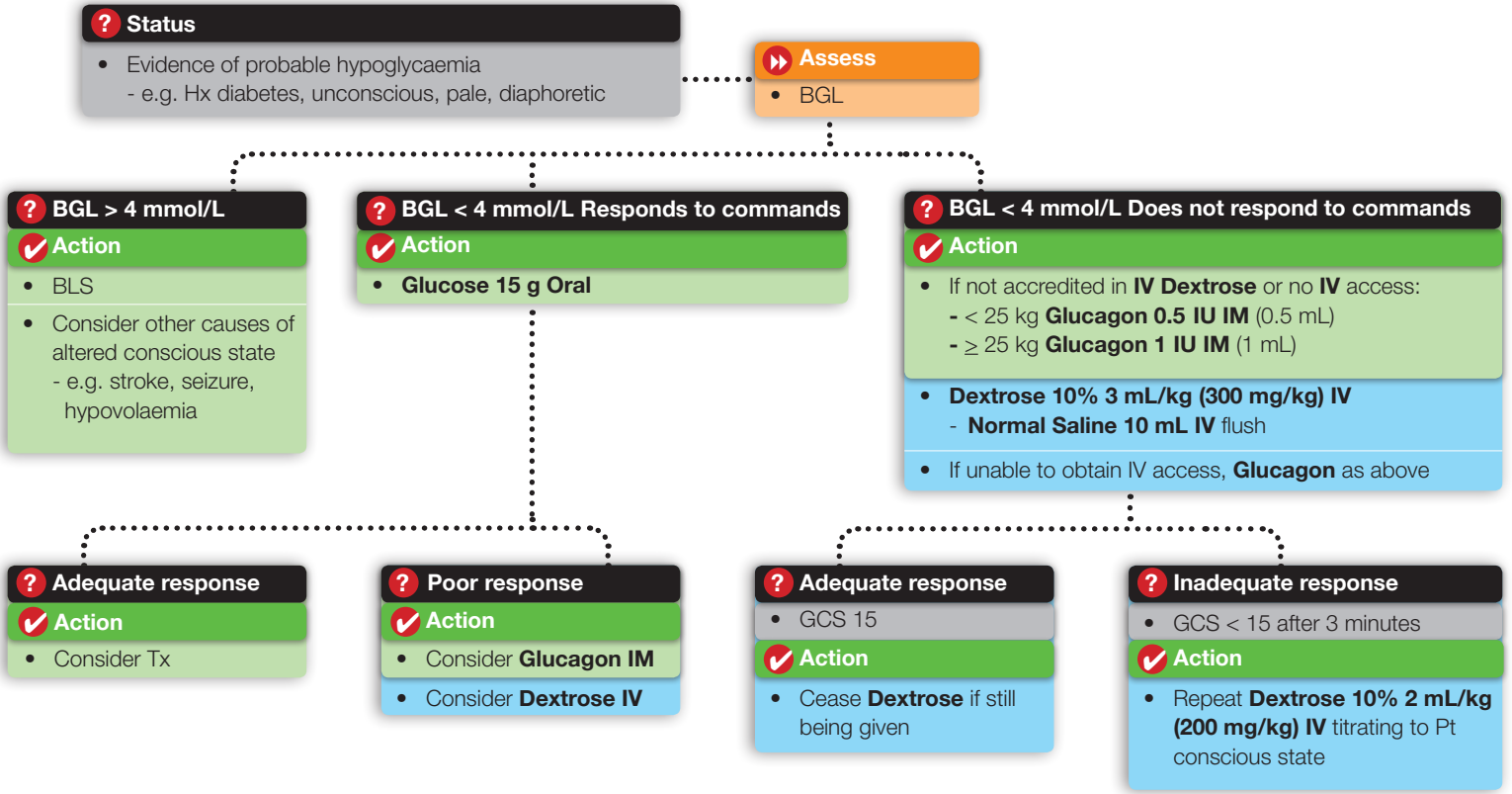
- Patients may be aggressive during management.
- Ensure IV patency before administering **Dextrose**. Extravasation of **Dextrose** can cause tissue necrosis.
- IV should be flushed well, both before and after **Dextrose** administration.
- Ensure sufficient advice on further management and follow-up if patient refuses transport.

## General Care

- If patient's next meal is more than 20 minutes away, encourage the patient to eat a long acting carbohydrate (e.g. sandwich, piece of fruit, glass of milk) to sustain BGL until next meal.
- If adequate response, maintain initial management and transport.
- If the patient refuses transport, repeat the advice for transport using friend / relative assistance. If patient still refuses transport, document the refusal and leave patient with a responsible third person. Advise the third person of actions to take if symptoms recur and of the need to make early contact with LMO for follow up.
- If inadequate response transport without undue delay.
- Maintain general care of unconscious patient and ensure adequate airway and ventilation.
- Further doses of **Dextrose 10%** may be required in some hypoglycaemic episodes. Consider consultation if BGL remains less than 4 mmol/L and unable to administer oral carbohydrates.
- Continue initial management and transport.

# Hypoglycaemia (Paediatric)





# Seizures (Paediatric)



## Special Notes

- 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).

## Special Notes

- 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

| Age | Newborn | Infant <1 | Small Child 1 - 4 | Medium Child 5 - 11 | Yrs |
|---|---|---|---|---|---|
| Weight | < 5 | 5 - 9 | 10 - 17 | 18 - 39 | kg |
| **Midazolam (IM)** 5 mg/1 mL (0.2 mL = 1 mg) | 0.1 | 0.2 | 0.5 | 0.5 - 1 | mL |
| | 0.5 | 1 | 2.5 | 2.5 - 5 | mg |
| | 1 mL syringe | | | | |
| **Midazolam (IV)** 15 mg/15 mL (1 mL = 1 mg) | 0.2 | 0.5 | 1 | 1 - 2 | mL |
| | 0.2 | 0.5 | 1 | 1 - 2 | mg |
| | Add 3 mL (15mg) Midazolam (from 15 mg in 3 mL ampoule) to 12 mL Normal Saline in a 20 mL syringe | | | | |

# Seizures (Paediatric)



**Status**
- Seizure activity

**Assess / manage**
- 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 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 airway patent, administer high-flow $O_2$
- **Midazolam IM**
  - **Medium Child (5 - 11 years) Midazolam 2.5 - 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 ceases**

**Action**
- BLS
- Continue to monitor airway, ventilation, conscious state and BP

**Seizure activity continues > 5 minutes**
- IV access

**Action**
- **Midazolam IV**
  - **Medium Child (5 - 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 P0301 Endotracheal Intubation**

**Rocuronium C/I**

**Seizure activity continues > 10 minutes**
- No IV access/accreditation

**Action**
- Repeat original **Midazolam IM** dose once only
- Consult for further doses
- Continue to monitor airway, ventilation, conscious state and BP



Status | Stop | Assess | Consider | Action | MICA Action

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# Anaphylaxis (Paediatric)



## Special 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.

## General Care

- 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 auto-injectors 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.

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.

Key reference: Simons FE, Ardusso L, Bilo M, Dimov V, Ebisawa M, El-Gamal Y, Ledford D, Lockey R, Ring J, Sanchez-Borges M, Senna GE, Sheikh A, Thong Y, and Worm M, "2012 Update: World Allergy Organisation Guidelines for the Assessment and Management of Anaphylaxis", Current Opinion in Allergy and Clinical Immunology, 2012, 12:389-399

# Anaphylaxis (Paediatric)



## Status

- Suspected anaphylaxis

## Stop

- Paramedics must transport the patient for observation and follow up if they have received adrenaline or there is ANY possibility of them having suffered an anaphylactic reaction

## Assess

- Sudden onset of illness (minutes to hours)

  **AND**

- Two or more of R.A.S.H.:
  - **R** Respiratory distress (SOB, wheeze, cough, stridor)
  - **A** Abdominal symptoms (nausea, vomiting, diarrhoea, abdo pain/cramps)
  - **S** Skin/mucosal symptoms (hives, welts, itch, flushing, angioedema, swollen lips/tongue)
  - **H** Hypotension (or altered conscious state)

  **OR**

- Isolated hypotension (relative to age) **with exposure to known antigen**

**No anaphylaxis**

**Action**

- BLS
- Reassess for potential deterioration
- Consider Tx for observation and further Mx

**Refusal of Transport**

If Pt < 18 years of age has had a possible anaphylactic reaction (irrespective of severity) then they must be transported.

**Anaphylaxis / Severe allergic reaction**

**Action**

- Monitor cardiac rhythm
- **Adrenaline 10 mcg/kg IM (1:1,000)**
  - Repeat **10 mcg/kg IM at 5 minute intervals** until satisfactory results or side effects occur
- Provide **high flow O2**
- Mx respiratory distress as indicated
  - Rx bronchospasm with **Salbutamol** as per **CPG P0602 Asthma**
  - Consider **nebulised Adrenaline** for upper airway oedema as per **CPG P0601 Upper Airway Obstruction**
- Where possible, do not allow pt to stand or walk

- Consider fluid as per **CPG P0801 Hypovolaemia**

**Irrespective of symptom resolution**

**Action**

- Tx
- Reassess en route
- Monitor for recurring symptoms

**Inadequate Response**

- Extremely poor perfusion and/or
- Impending cardiac arrest

**Action**

- If no IV access consider IO
- Commence **Adrenaline infusion at 0.05 mcg/kg/minute**
  - If necessary titrate to effect up to a max. rate of **1 mcg/kg/min**
- If unable to establish infusion **Adrenaline 10 mcg/kg IV/IO**
  - Repeat **10 mcg/kg IV/IO at 1 minute intervals** until adequate perfusion or side effects occur

# Meningococcal Septicaemia (Paediatric)

**CPG P0706**

## Special 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.

## General Care

- **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

| Age | 0 | 3 Mth | 6Mth | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Yrs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight | 3.5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 33 | 36 | kg |
| **Ceftriaxone (IM)** **50 mg/kg** 1 g diluted with 3.5 mL 1% Lignocaine (1 mL = 250 mg) | 0.7 | 1.2 | 1.6 | 2 | 2.4 | 2.8 | 3.2 | 3.6 | 4 | 4 | 4 | 4 | 4 | 4 | mL |
| | 175 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | mg |
| | 1 mL syringe | | 2.5 mL syringe | | | 10 mL syringe | | | | | | | | | |
| **Ceftriaxone (IV)** **50 mg/kg** 1 g diluted with 9.5 mL Water for Injection (1 mL = 100 mg) | 1.75 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | mL |
| | 175 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | mg |
| | 10 mL syringe | | | | | | | | | | | | | | |

# Meningococcal Septicaemia (Paediatric)



**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**
- Unable to gain
- Not IV accredited

**Action**
- **Ceftriaxone 50 mg/kg IM (max. 1000 mg)**
  - Dilute **1000 mg** with **3.5 mL Lignocaine 1%**
  - Administer into upper lateral thigh

# Overdose (Paediatric)



## General Care

- 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)**.

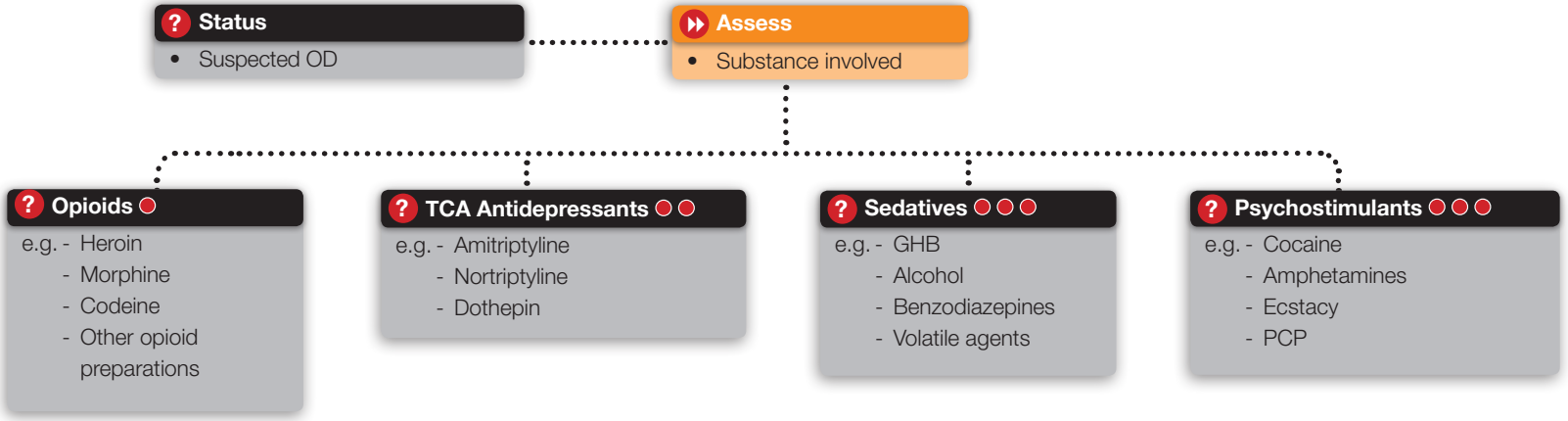
## General Care

- 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.

# Overdose (Paediatric)





# Overdose: Opioids (Paediatric)



## Special Notes

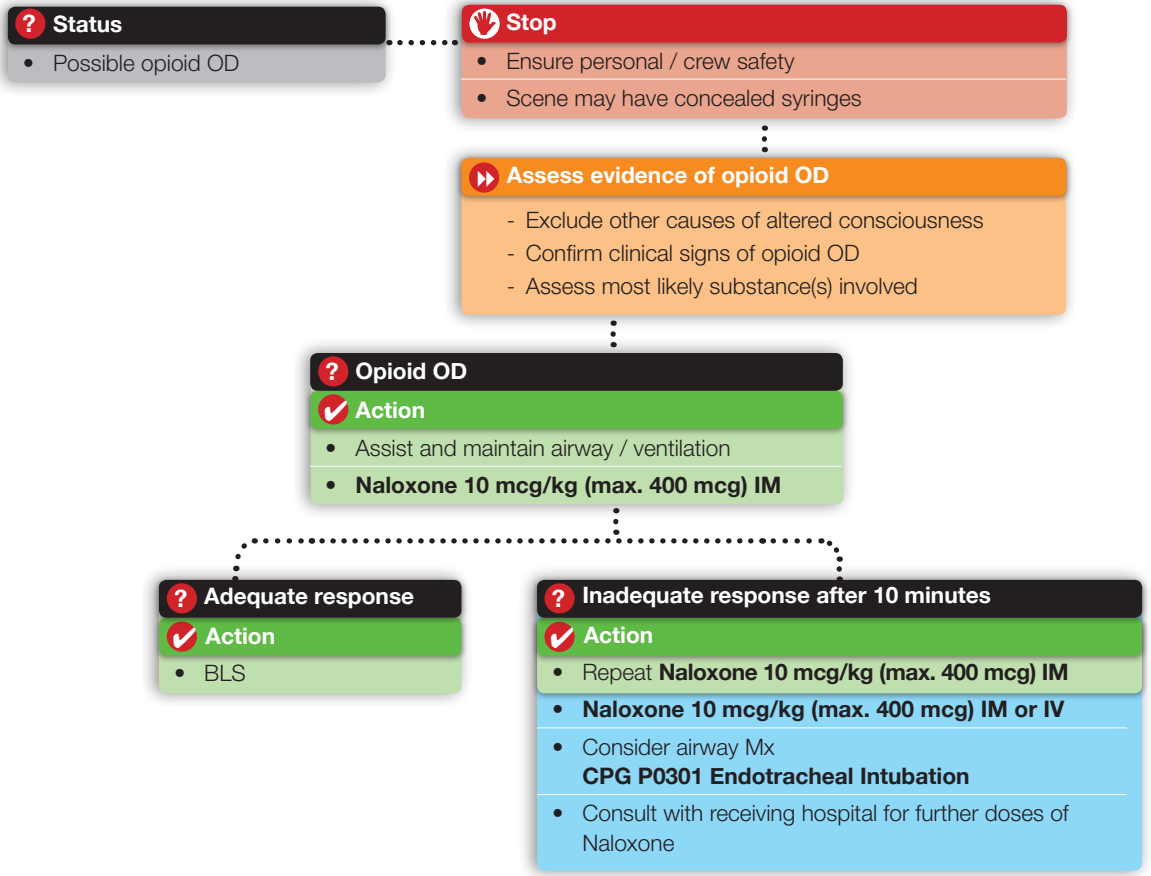
- Opioids may be in the form of IV preparations such as Heroin or Morphine and oral preparations such as Codeine, Endone, MS Contin. Some of these drugs also come as suppositories and topical patches.
- Not all opioid overdoses are from IV administration of the drug.

## General Care

- 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.

# Overdose: Opioids (Paediatric)





# Overdose: Tricyclic Antidepressants (TCA) (Paediatric) CPG P0707

## Special Notes

**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

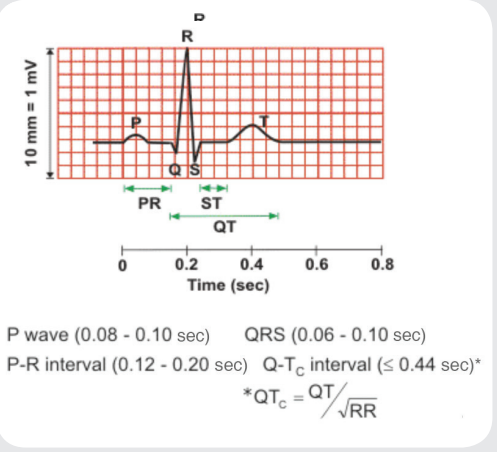
This could lead to aspiration, hyperthermia, rhabdomyolysis and APO.

## Special Notes

**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.

**How to measure a QT interval is shown below.**




P wave (0.08 - 0.10 sec) QRS (0.06 - 0.10 sec)

P-R interval (0.12 - 0.20 sec) Q-$T_C$ interval (≤ 0.44 sec)*

$$*QT_c = QT/\sqrt{RR}$$

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

# Overdose: Tricyclic Antidepressants (TCA) (Paediatric) CPG P0707

**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% $O_2$
  - $EtCO_2$ target 20 - 25 mmHg if intubated

# Overdose: Sedative Agents/Psychostimulants (Paediatric) CPG P0707

## Special Notes

- 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 or serious untreated injuries.

## Special Notes

- 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.

# Overdose: Sedative Agents/Psychostimulants (Paediatric) CPG P0707

**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 methamphetamines
- 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 A0708 Agitation**

# Organophosphate Poisoning (Paediatric)

CPG P0709

## Special Notes

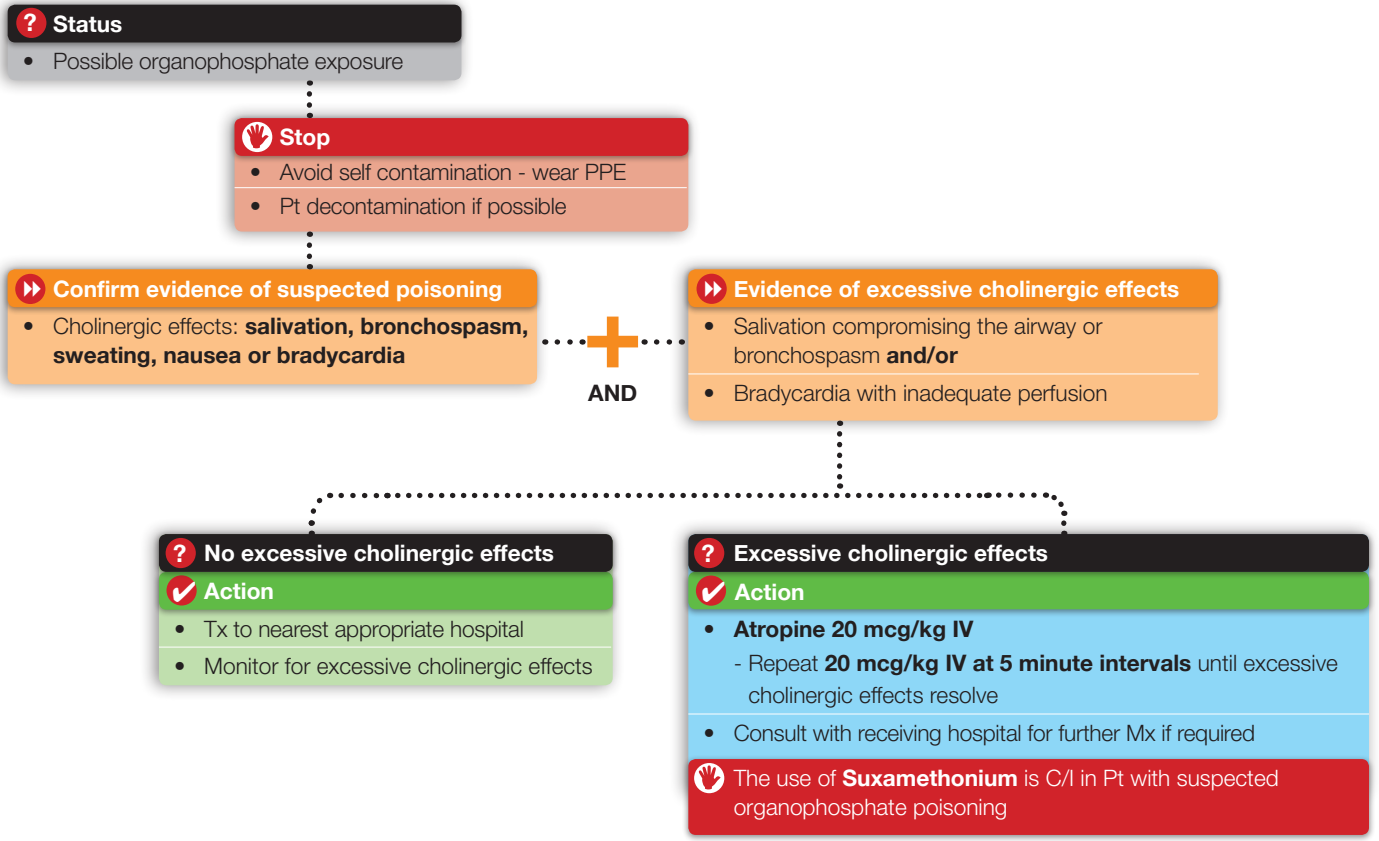
- Notify the receiving hospital as patient isolation is essential.
- The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used not only commercially but also domestically.
- If a potential contamination by a possible organophosphate has occurred, 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.

## General Care

- 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.

# Organophosphate Poisoning (Paediatric)





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# Hypovolaemia (Paediatric)



## General Care

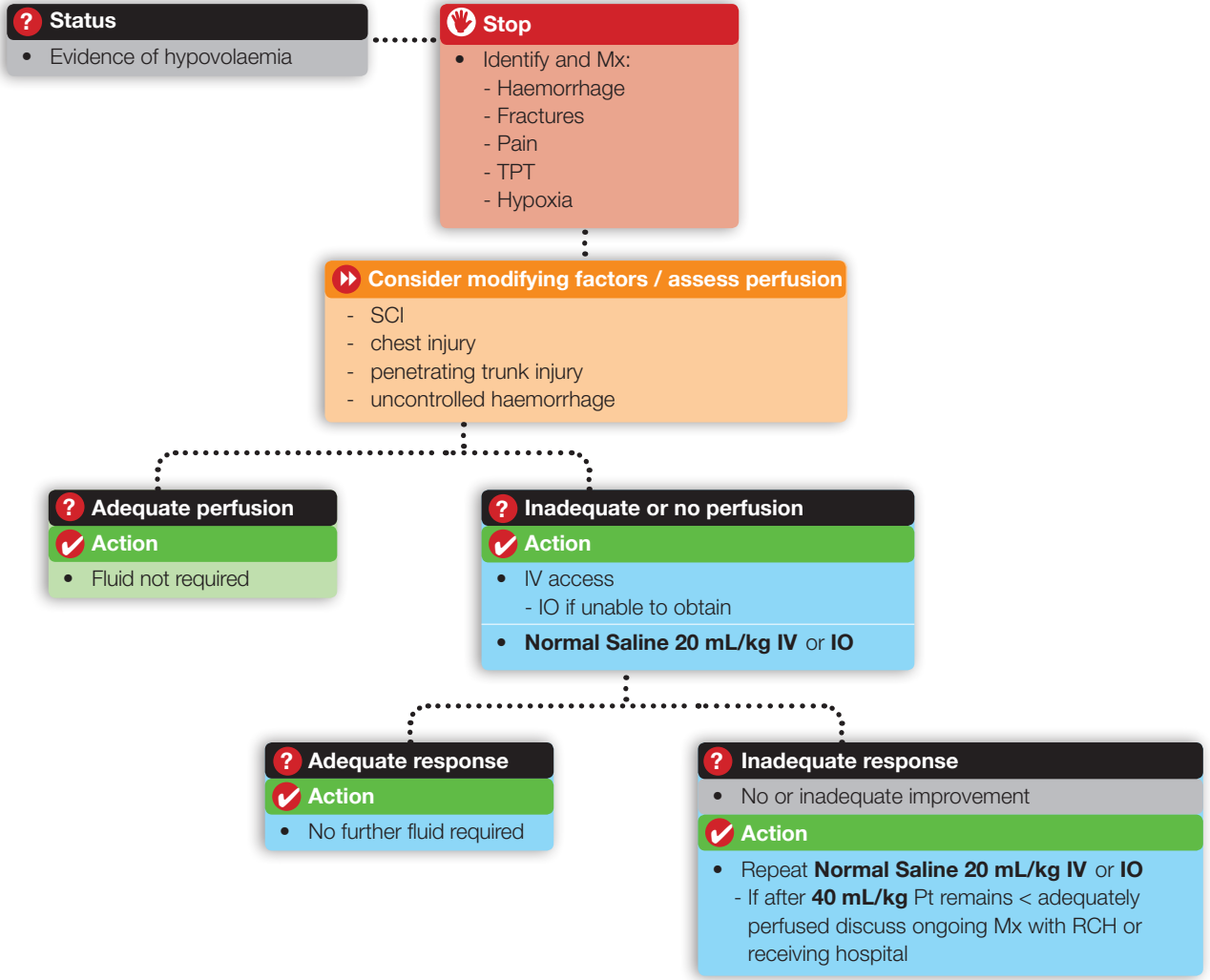
- Modifying factors must be considered and managed prior to aggressive fluid therapy.
- Always consider the possibility of TPT in the patient with persistent hypotension unresponsive to fluid therapy, in the setting of a chest injury.
- Excessive fluid should not be given if SCI is an isolated injury.
- 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.**

# Hypovolaemia (Paediatric)





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# Chest Injuries (Paediatric)

CPG P0802

## Special Notes

**Care objectives**

- To identify and manage time critical chest injuries such as tension pneumothorax

**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 $SpO_2$ 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.

## General Care

**Chest decompression**

- Insertion site for cannula/intercostal catheter (SMART):
  - **S**econd intercostal space
  - **M**id - clavicular line (avoiding medial placement)
  - **A**bove rib below (avoiding neurovascular bundle)
  - **R**ight angles to chest
  - **T**owards 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.

# Chest Injuries - General (Paediatric)



**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**
- Signs of pneumothorax

**Action**
- See **CPG P0802 Chest injuries – Tension Pneumothorax**

# Chest Injuries - Tension Pneumothorax (Paediatric)



**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
  - $SpO_2$ <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
  - ↓ $SpO_2$ to < 92 % despite $O_2$
  - ↓ Conscious state
  - Poor perfusion or ↑ HR +/- ↓ BP
  - ↑ Peak inspiratory pressure (ventilator) / stiff bag
  - ↓ $EtCO_2$
  - ↑ JVP
  - Tracheal shift

**Cardiac arrest imminent**

**Action**
- Immediate chest decompression as per General care

**Cardiac arrest NOT imminent**

**Action**
- Monitor closely for deterioration
- Chest decompression
  - GCS > 10 consult with RCH for **Lignocaine 1%** local anaesthetic infiltration and decompress as per general care

# Burns (Paediatric)

CPG P0805

## Special Notes

**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.

- 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.

## General Care

**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.

Key reference: www.rch.org.au/clinicalguide/guideline_index/Burns/

# Burns (Paediatric)



**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

**If resources allow manage concurrently**

**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

# Burns (Paediatric)



## Special Notes

### Transport

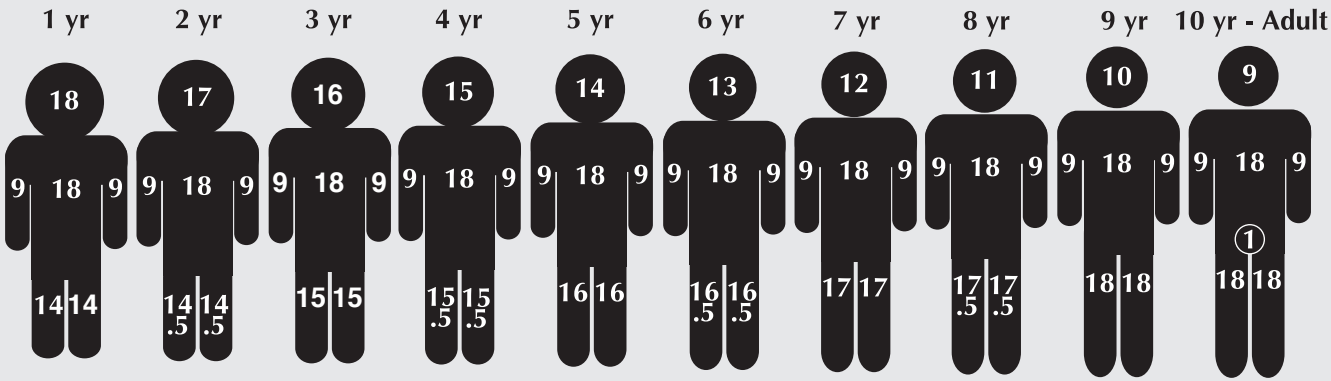
- All burns patients who meet the time critical trauma criteria (> 10% TBSA, suspected airway burns, > 1000 volt electrical burns) should be transported to the Royal Children's Hospital as a preference, if within 45 minutes transport time. If transport time > 45 minutes, transport to the nearest alternative 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.

## General Care

## Special Notes

### Paediatric-Adult Burns Assessment Ruler

**Expressed as a % of Total Body Surface Area**




**Chest + Abdomen = 18% Front or 18% Back Limbs are measured circumferentially**

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# Hypothermia / Cold Exposure (Paediatric)

CPG P0901

## Special Notes

- Hypothermia is insidious and rarely occurs in isolation. Where the patient is part of a group, other members of the group should be carefully assessed for signs of hypothermia.
- Arrhythmia in hypothermia is associated with temperatures below 33°C.
- Atrial arrhythmias, bradycardia or A-V blocks generally resolve on rewarming. Treatment with antiarrhythmic agents is usually not required unless decompensation has occurred.
- Defibrillation and cardioactive drugs may not be effective at temperatures below 30°C. VF may resolve spontaneously upon re-warming.
- The onset and duration of drugs is prolonged in hypothermia and the interval between doses is therefore doubled, e.g. doses of **Adrenaline** become 8 minutely.
- Gentle handling of the patient is essential. Position flat or lateral and avoid head up position to avoid causing arrhythmias.

## General Care

- Shelter from wind in a heated environment.
- Remove all damp or wet clothing.
- Gently dry patient with towels / blankets.
- Wrap in warm sheet / blanket - cocoon.
- Cover head with towel / blanket - hood.
- Use thermal / space / plastic blanket if available.
- Only warm frostbite if there is no chance of refreezing prior to arrival at hospital.
- Assess BGL if altered conscious state.

**Normothermic fluid**

- Where IV fluid is indicated, **Normal Saline** warmed between 37 - 42°C should be given to avoid worsening of hypothermia (if available).

# Hypothermia / Cold Exposure (Paediatric)



**Status**

- Hypothermia

**Assess**

- Mild hypothermia 32 - 35°C
- Moderate hypothermia 28 - 32°C
- Severe hypothermia < 28°C
- If alteration to cardiac arrest Mx as required

**Non-cardiac arrest**

- Moderate / severe hypothermia < 28-32°C

- Normothermic **Normal Saline 10 mL/kg IV - Repeat 10 mL/kg IV (max. 40 mL/kg)** to maintain perfusion
- Avoid drug Mx of cardiac arrhythmia unless decompensated and until rewarming has commenced

**Cardiac arrest**

**Action**

- Manage as per **CPG P0201 Cardiac Arrest** as described in Special Circumstances

# Environmental Hyperthermia Heat Stress (Paediatric)

CPG P0902

## Special Notes

- Patients with temperatures of < 40°C may normally be managed with basic cooling techniques alone.
- This CPG is not intended for the management of the febrile patient due to infection.

## General Care

- During cooling, the patient should be monitored for the onset of shivering. Shivering may increase heat production and cooling measures should be adjusted to avoid its onset.
- Gentle patient handling is essential. Position the patient flat or lateral and avoid elevating the head to minimise the potential for an arrhythmia.

# Environmental Hyperthermia Heat Stress (Paediatric)



**Status**
- Hyperthermia/Heat stress

**Assess**
- Accurately assess temp
- BGL if altered conscious state
- Perfusion status

**Requires active cooling**

**Action**
- Cooling techniques - initiated and maintained until temp is < 38°C
  - Shelter / remove Pt from heat source
  - Ensure airflow over Pt
  - Remove all clothing except underwear
  - Apply tepid water using spray bottle or wet towels
- Mx low BGL as per **CPG P0702 Hypoglycaemia (Paediatric)**
- Airway and ventilation support with 100% $O_2$ as required
- Rx inadequate perfusion per **CPG P0801 Hypovolaemia (Paediatric)**
  - Cooled fluid preferable if available
  - If cool fluids initiated, return to ambient temp fluid once Pt temp is < 39°C

**Adequate response**

**Action**
- BLS
- Tx

**Poor response after 10/60**
- Severe cases - temp > 39.5°C
- GCS < 10

**Action**
- Pt time critical, continue initial Mx

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# Treat and Refer

# CPG TR0101

## Special Notes

- 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.

## General Care

- 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.

# Treat and Refer

# CPG TR0101

**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 vitals 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.

# Treat and Refer Epistaxis

CPG TR0201

## Special Notes

- 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.

## General Care

- 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.

# Treat and Refer Epistaxis



**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

**OR**

- 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

# **Treat and Refer** Suspected Gastroenteritis

# CPG TR0202

## Special Notes

- 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.

## General Care

- 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 principal 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.

# Treat and Refer Suspected Gastroenteritis

# CPG TR0202

**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, melaena, 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?

**Yes**

**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

**No**

**Action**

- Organise appropriate transport to ED

# **Treat and Refer** Heroin Overdose

# CPG TR0203

## Special Notes

- 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.

# Treat and Refer Heroin Overdose



## 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, eg. 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**

## Action

- 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**

## Action

- 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

# Treat and Refer Hypoglycaemia

# CPG TR0204

## Special Notes

- 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.

## General Care

- 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.

# Treat and Refer Hypoglycaemia



## Status

- Hypoglycaemia with full recovery

## STOP

Do not proceed if:

- Incomplete recovery (to normal conscious state)
- Risk of prolonged or recurrent hypoglycaemia:
  - Unwitnessed onset / prolonged episode
  - Patient on oral hypoglycaemic medication
  - Overdose on medication (accidental or intentional)
  - Unable or unwilling to consume further carbohydrate
  - Unable to be monitored by a responsible adult for at least 4 hours
- No diagnosis of diabetes
- Suspected cause of hypoglycaemia requires further investigation e.g. infection
- Injury or seizure sustained
- Pregnancy

## Assess

- Has patient fully recovered, consumed further carbohydrate and is able to be monitored by a responsible adult for at least 4 hours?

**Yes**

## Action

- Provide patient and/or carer with self-care advice and Health Information Sheet
- Refer patient to usual diabetes primary care provider within 24 hours particularly if hypoglycaemia is becoming more frequent

- Prior to departing scene:
  - Confirm BGL > 4 mmol/L and patient remains in normal conscious state (at least 10 minutes after last treatment).
  - Confirm that if cannulation was required, IV has been removed.
  - Confirm that the patient and/or carer understands the advice given.

**No**

## Action

- Organise appropriate transport to ED or primary care provider for review

# Treat and Refer Minor Burns

# CPG TR0205

## Special Notes

- This CPG is intended for adult patients who have sustained a minor, superficial burn injury from a thermal source e.g. scald or contact with hot objects.
- If any doubt exists as to the nature, size or depth of the burn then the patient should be transported to hospital for further assessment. Continue management as per **CPG A0805 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 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**.

# Treat and Refer Minor Burns



## 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**

## Action

- 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

**No**

## Action

- Organise appropriate transport to ED or primary care provider

# **Treat and Refer** Minor Wounds

# CPG TR0206

## Special Notes

- 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.

## General Care

- 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.

# Treat and Refer Minor Wounds



## 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-tibial 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?

**Yes**

## 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 A0501 Pain Relief**
- Provide patient with Health Information Sheet and confirm the patient understands the advice given prior to departing the scene

**No**

## Action

- Organise transport to ED or primary care provider for further management

# Treat and Refer Seizures

# CPG TR0207

## Special Notes

- 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.**

## General Care

- 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.

# Treat and Refer Seizures



## 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**

## Action

- 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**

## Action

- Transport directly to ED

# **Treat and Refer** Soft Tissue Injury

# CPG TR0208

## 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.

# Treat and Refer Soft Tissue Injury



## Status

- Isolated soft tissue injury with no obvious fracture / dislocation

## STOP

Do not proceed if:

- Evidence of significant fracture or dislocation (e.g. crepitus, 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 Pt 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

# **Treat and Refer** Undiagnosed Lower Back Pain

# CPG TR0209

## 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.

# Treat and Refer Undiagnosed Lower Back Pain

# CPG TR0209

## Status

- Undiagnosed lower back pain < 4 weeks duration

## 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
  - Immunocompromised

* If appropriate, alternative methods of transport to ED may be considered

## Assess

- Is patient able to ambulate and access alternative care for further management?

**Yes**

## 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

**No**

## Action

- Organise appropriate transport to ED or primary care provider

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# Maternity Emergencies



**Status**
- Pregnancy related

**Assess**
- Gestation
- In labour
- Rupture of membranes
- Presenting part on view
- Baby born

**Other maternity problem**

**Action**
- Trauma – as per appropriate CPG
- Cardiac arrest
  - as per **CPG A0201 Cardiac Arrest**

**Birth not imminent**

**Assess**
- Complicated
- Uncomplicated

**Baby born**

**Action**
- Newborn care as per **CPG N0201 Newborn Resuscitation**
- Intra-partum care
  - Delivery as per **CPG M0301 Normal Birth**
  - PPH as per **CPG M0401 Primary Postpartum Haemorrhage (PPH)**

**Birth imminent**

**Assess**
- Complicated
- Uncomplicated

**Uncomplicated**

**Action**
- Basic care
- Pain relief as required as per **CPG A0501 Pain Relief**
- Continue to monitor
- Tx

**Complicated**

**Action**
- Mx as per **CPG M0201 Antepartum Haemorrhage (APH)**
- Mx as per **CPG M0202 Pre-eclampsia / Eclampsia**

**Uncomplicated**

**Action**
- Delivery as per **CPG M0301 Normal Birth**

**Complicated**

**Action**
- Mx as per **CPG M0302 Breech Presentation**
- Mx as per **CPG M0303 Preterm Labour**
- Mx as per **CPG M0304 Cord Prolapse**
- Mx as per **CPG M0305 Shoulder Dystocia**



Status | Stop | Assess | Consider | Action | MICA Action

# Maternity Emergencies: Definitions



## Definitions

**Term:** 37 - 42 weeks gestation

**Preterm:** 24 – < 37 weeks gestation

**Show:** Vaginal discharge of mucous and blood

**Spontaneous rupture of membranes:** Gush of normally clear or pink coloured fluid. Can occur from prior to onset of labour until baby is born.

**Meconium stained amniotic fluid:** Greenish / brown stained amniotic fluid

**First stage labour:** Onset of regular painful contractions to full cervical dilatation
*(i.e. contractions every 2 - 20 minutes, 20 - 60 seconds duration)*

**Second stage labour:** Full cervical dilatation to birth of baby
*(typical duration Primipara 1 - 2 hours, Multipara 15 - 45 minutes)*

**Imminent birth presentation:** 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"

**Precipitate birth:** Unusually rapid labour (less than 4 hours) with extremely quick birth. The rapid change in pressure from intrauterine life may cause cerebral irritation.

### 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.

# Maternity Emergencies: Assessment



## 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

# Maternity Emergencies: Physiological Parameters



## Physiological parameters

### Cardiovascular

| | | |
|---|---|---|
| **BP** | Minimal change – initial decrease in 1st and 2nd trimesters, normal in 3rd trimester<br>SBP > 170 mmHg and DBP > 110 mmHg is significant | |
| **HR** | ↑ by 15 – 20 bpm | (Normal pregnancy HR 80 – 110 bpm) |
| **Cardiac output** | ↑ by 30 – 40% | (Normal volume 6 – 7 L/minute during pregnancy) |
| **ECG** | Non specific ST changes, Q waves – (leads III and AVF) atrial and ventricular ectopics | |
| **SVR** | ↓ due to progesterone and blood volume | |

### Respiratory

| | | |
|---|---|---|
| **Respiratory rate** | ↑ by 15% (2 – 3 breaths/minute) | 14 – 19 breaths/minute at term |
| **$O_2$ demand** | ↑ by 15 - 20% | |
| **Minute ventilation** | ↑ by 25 – 50% | 11 – 19 L/minute at term |
| **Tidal volume** | ↑ by 25 – 40% | 8 – 10 mL/kg at term |
| **Arterial pH** | ↑ to 7.40 – 7.45 | |
| **$PaO_2$** | ↑ by 10 mmHg | 104 – 108 mmHg at term |
| **$PaCO_2$** | ↓ 27 – 32 mmHg | |

### Haematological

| | | |
|---|---|---|
| **Blood volume (mL)** | ↑ 30 – 50% vol | 5,500 mL at term |
| **Haemoglobin (g/dL)** | ↓ 10 – 14 | Red cell mass ↑ by 20 – 30% but is less than blood volume increase |
| **Haemoglobin (g/L)** | ↓ 100 – 140 | |
| **Haematocrit (%)** | ↓ 32 – 42 (physiological anaemia) | |
| **Plasma volume (mL)** | ↑ 30 – 50% | |

# Maternity Emergencies: Basic care



## 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 $O_2$:** To maintain $SpO_2 \geq 94\%$

**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.**

# Maternity Emergencies: Destination hospital



## Maternity

When transporting a baby born out of hospital or a woman in labour:

**Metropolitan:**

- Transport to a public hospital that has a Maternity Service ***bypassing*** hospitals that do not.
  - If **at term (>36 weeks gestation)** and an uncomplicated labour is anticipated, then the default destination should be the hospital the patient is booked into whether public or private.
  - If **preterm** and
    - **between 32 - 36 weeks gestation** consult with PIPER for advice regarding destination.
    - **< 32 weeks gestation** the receiving hospital should be the closest of the Royal Women's Hospital, Mercy Hospital for Women Heidelberg or Monash Clayton. These hospitals have appropriate NICU facilities.

**Rural:**

- All pregnant women with complications of pregnancy / labour should be transported to the closest Regional Base Hospital.

**If birth appears imminent:**

- Default to the closest hospital with a Maternity Service.

## Trauma

**Metropolitan:**

- Patient pregnant and trauma time critical – Transport to the Royal Melbourne Hospital (RMH) if within 45 minutes. If > 45 minutes, transport to nearest alternative highest level of trauma service.
- Patient pregnant (gestation > 24 weeks) with any trauma with the potential to harm the foetus – Transport to RMH as above.
- All other pregnant patients with traumatic injuries – Tx to metropolitan trauma service. It is not appropriate to transport pregnant patients with trauma of any kind to a maternity service.

**Rural:**

- Transport to highest designated trauma receiving centre within 45 minutes.
- In all cases of prolonged transport, consider alternative air transport.
- In all cases, appropriate consultation should occur with hospital notification provided.

### Severe medical complication

**Metropolitan**

- 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 an obstetric condition e.g. ectopic pregnancy.

**Rural**

- Transport to nearest designated hospital capable of accepting time critical medical and obstetric patients.
- In all cases of prolonged transport, consider alternative air transport.

# Maternity Emergencies: Female Genital Mutilation/Cutting



## Assessment and cultural considerations

- 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.

## General Care

- 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.**

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# Antepartum Haemorrhage (APH)

# CPG M0201

**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 unavailable repeat **Normal Saline 20 mL / kg IV**
- Mx pain as per **CPG A0501 Pain Relief**

# Pre-eclampsia / Eclampsia

CPG M0202

## Special Notes

- 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**

## Special Notes

**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. Consult with hospital staff to confirm treatment prior to transport.

**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.

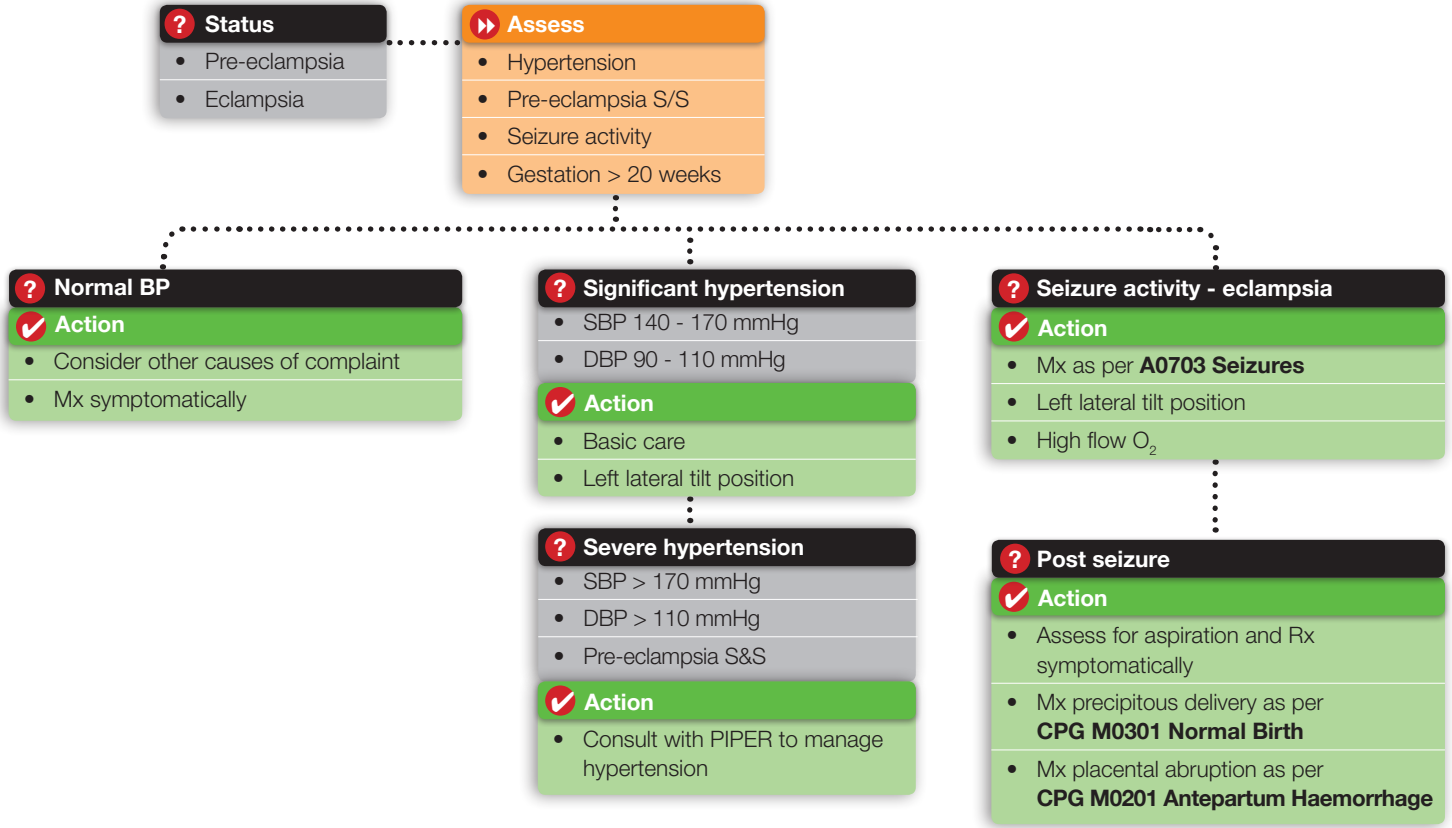
*IV Hydralazine*

- 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.

# Pre-eclampsia / Eclampsia

## CPG M0202



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# Normal Birth



**Status**
- Imminent normal birth

**Assess**
- Maternity Hx
- Labour progression

**Stop**
- Opioid analgesics are C/I in late second stage labour

**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**

**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**

**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 perineum 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

# Normal Birth



## 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

## 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 skln 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 10 cm from the baby and the second clamp a further 5 cm 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)

- Delivery of baby to placenta

### Action

**Passive (expectant) Mx**

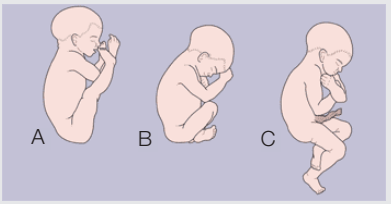
- Allow placental separation to occur spontaneously without intervention
- This may take from 15 minutes up to 1 hour
- Position mother sitting or squatting to allow gravity to assist expulsion
- Breast feeding may assist separation or expulsion
- **Do not pull on cord – wait for signs of separation**
  - 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)**

# Breech / Compound Presentation: (Imminent birth)

CPG M0302

## Special Notes

### 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.

# Breech / Compound Presentation: (Imminent birth)



**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 C/I 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

**Imminent 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

# Breech / Compound Presentation: (Imminent birth)



**? Buttocks first presentation – back uppermost – delivery of body/legs**

**✔ Action**

- This is the most common presentation
- **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**

**✔ Action**

- 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

**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**

**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

**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 180 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**

# Preterm Labour



## Special Notes

- 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.

**Contact PIPER via Clinician or on 1300 137 650 for advice**

## Special Notes

**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.

# Preterm Labour

## CPG M0303

**Status**
- Uterine contraction present @ 20 - 37 weeks

**Assess**
- Ruptured membranes
- Check for cord prolapse
- Stage of labour

**Cord prolapse**

**Action**
- Mx as per **CPG M0304 Cord Prolapse**

**Birth imminent**

**Action**
- Consider other causes of complaint
- Mx symptomatically

**Birth not imminent ≥ 34 weeks**

**Action**
- Basic care
- Reassure

**Birth not imminent < 34 weeks**

**Action**
- Consult for **50 mg GTN patch (0.4 mg/hr)** applied to the abdomen
- A further **50 mg GTN patch (0.4 mg/hr)** may be added after 1 hr if contractions persist **(max. 20 mg / 24 hr)**

# Cord Prolapse

CPG M0304

## 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**

## General Care

# Cord Prolapse

CPG M0304

**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**

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# Shoulder Dystocia

# CPG M0305

## Special Notes

- 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**

## General Care

# Shoulder Dystocia

CPG M0305

**Status**
- Possible shoulder dystocia

**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 restitute
- 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)**

**Action**
- Note time of birth of head
- Request urgent additional assistance
- Explain to mother and ask her to push with focused effort when required
- Position mother with buttocks at bed edge
- Apply gentle downward traction to deliver anterior shoulder

**Delivery accomplished - newborn**

**Action**
- Mx as per **CPG N0201 Newborn Re-suscitation**
- Assess for clavicle injury and immobilise if necessary

**Delivery accomplished - mother**

**Action**
- Basic care
- Reassure

**Delivery not accomplished - after 30 - 60 sec**

**Action**
- Alternate the following sequence until baby is delivered
- Mx as per Delivery accomplished if successful at any time

**At no time attempt to rotate the baby's head — rotate shoulders using pressure on the baby's scapula instead**

**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 45º 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**

- Mx 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 30º left lateral tilt

# Primary Postpartum Haemorrhage (PPH)

CPG M0401

## 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.

**Contact Paediatric Infant Perinatal Emergency Retrieval (PIPER) via Clinician or on 1300 137 650 for advice**

## Special Notes

- **Misoprostol** is a synthetic prostaglandin which is licensed in Australia for prevention of gastric ulcers. However, because it can induce / augment uterine contractions it is used for inducing labour / abortion as well as to treat haemorrhage after normal delivery. Its use in PPH is supported by tertiary maternity services in Victoria. **Misoprostol** is widely used in countries where there are no other medications available to control PPH. As its use in these circumstances is not licensed in Victoria, verbal patient consent must be obtained prior to administration and appropriate notation made.
- There may be some risks / complications and side effects which may include nausea, diarrhoea or abdominal pain. In rare instances in women who have had a caesarean section, the uterine scar may rupture which would require surgery.
- Side effects are unlikely for the dosage that will be given.
- **Misoprostol** and **Oxytocin** can be given to the same patient in the same episode of care. In the setting of PPH, if **Oxytocin** is not immediately available then **Misoprostol** should be administered without delay.
- Where severe bleeding occurs at 24 hrs to 6 weeks post birth (secondary PPH), consult with receiving hospital regarding the administration of **Oxytocin** or **Misoprostol.**

# Primary Postpartum Haemorrhage (PPH) CPG M0401

**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 $O_2$ 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**
- **Misoprostol 800 mcg Oral**
- **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



Status | Stop | Assess | Consider | Action | MICA Action

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# The Newborn Baby

# CPG N0101

## General Information

### 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.

**Care Objectives**

- Establish and maintain effective respiration
- Prevent hypothermia
- Transport to appropriate facility

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

Further Reading: www.neoresus.org.au

## Normal Values

| | | |
|---|---|---|
| **Weight (avg full term)** | 3.5 kg | |
| **Normal blood volume** | 80 mL/kg | |
| **Heart rate** | 110 – 170 | |
| **Respiratory rate** | 25 – 60 | |
| **Temperature** | 36.5 – 37.5 | |
| **BGL** | 2.6 – 3.2 mmol/L | |
| **Appearance** | Dusky and peripherally cyanosed in the first few minutes.<br>Blue-ish / purple hands and feet are normal in the first 24 hours after birth.<br>Supplemental oxygen is generally not required where the newborn is breathing effectively and the HR is > 100.<br>Good muscle tone (flexing arms and legs)<br>Spontaneous regular breathing | |
| **Targeted $SpO_2$** (mins post birth)<br>Pulse oximeters should always be placed on the right wrist (pre-ductal). | 1 min | 60 – 70% |
| | 3 mins | 70 – 90% |
| | 5 mins | 80 – 90% |
| | 7-10 mins | > 90 % |

# The Newborn Baby



## General care

### 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.

# The Newborn Baby

## CPG N0101

**? 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**

**? Normal newborn: Resuscitation not required**

**Action**

- Cut cord once cord stopped pulsating (approx. 1-2 mins) unless parental preference is to remain attached
- Note APGAR when practicable

**? Apnoeic or gasping or no muscle tone**

- Non vigorous newborn

**Action**

- 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

**Rural Victoria**

- Tx to nearest base hospital or hospital with maternity service and contact PIPER

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# Newborn 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.**

- 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 $cmH_2O$) 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.

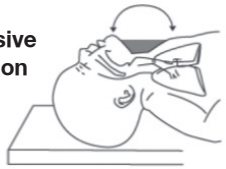
**Indications for withholding resuscitation**

- 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.

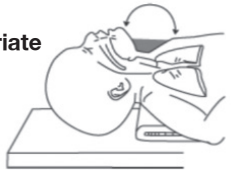
**Airway**

- 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.

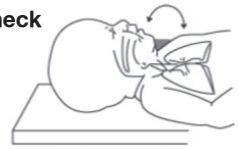
**Avoid excessive head extension**



**Appropriate neutral position**



**Avoid neck flexion**



# Newborn Resuscitation



### 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 $H_2O$ 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 $EtCO_2$ detectors should be used for all newborns requiring intubation. Continuous waveform $EtCO_2$ monitors may provide inaccurate readings due to small tidal volumes (5 - 10 mL/kg).

| | ETT size (mm) | Lip length (wt in kg + 6 cm) | ETT suction catheter | NG tube | Laryngoscope blade | i-Gel | Suction catheter (negative pressure) |
|---|---|---|---|---|---|---|---|
| < 1 kg or < 28 wks 'extremely preterm' | 2.5 | 6 – 7 cm | 6 FG | 6 FG | 00 straight miller blade | None | 10 – 12 FG (-100 mmHg) |
| 1-3 kg or 28 – 34 wks 'moderately preterm' | 3 | 7 – 9 cm | 6 FG | 8 FG | 0 or 1 straight Miller blade | None | |
| > 3 kg or ≥ 35 wks 'term or near term' | 3.5 | 9 – 10 cm | 6 FG | 8 FG | 0 or 1 straight Miller blade | Size 1.0 for >2 kg | |

### 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

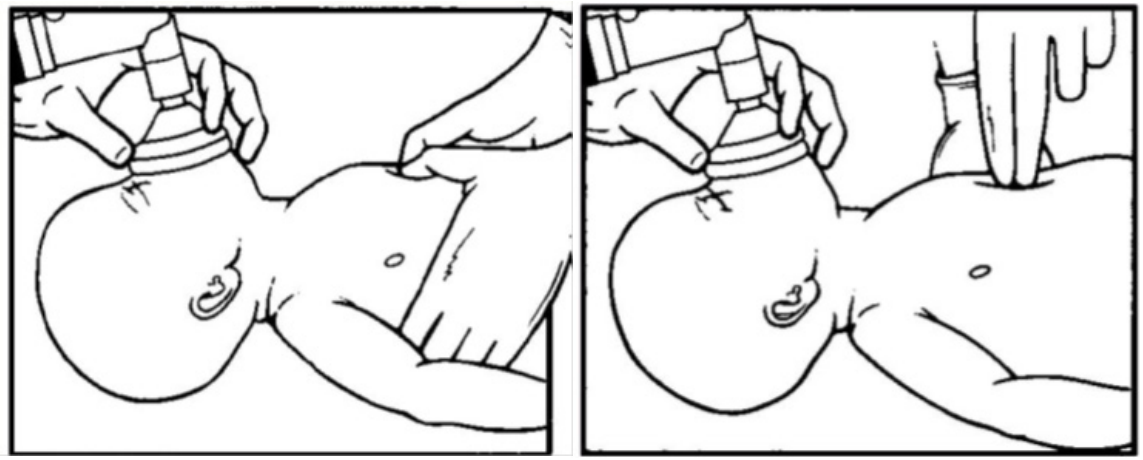
- Attach to the right hand or right wrist (pre-ductal). See **CPG N0101 The newborn baby** for normal values post birth. $SpO_2$ significantly lower than these values may guide the use of supplemental oxygen.
- Obtaining a reliable $SpO_2$ trace in newborns can be problematic. Consider $SpO_2$ strength of waveform and overall patient condition in determining the reliability of $SpO_2$ reading.

# Newborn Resuscitation: Circulation



**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 being 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.

# Newborn Resuscitation

CPG N0201

Within 60 seconds

**Status**
- Birthed, dried, skin to skin with mother

**Assess**
- Breathing
- Muscle tone (flexed arms and legs)

**Breathing adequately and good muscle tone**
- Vigorous newborn

**Action**
- Manage as per **CPG N0101 The newborn baby**

**Apnoeic 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 apnoeic 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

# Newborn Resuscitation



**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**
- If HR < 60 persists despite adequate ventilation:
  - **Adrenaline 10 mcg/kg IV/IO** 4 minutely
- 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 $SpO_2$ < 90%**

**Action**

- **Breathing laboured:**
  - **IPPV at 40-60 per minute**
  - Titrate **oxygen (1 - 5L/min)** to meet target saturations
- **Breathing normally:**
  - Maintain warmth and Tx as per **CPG N0101 The newborn baby**
  - Titrate **oxygen 1 - 2 L/min via nasal cannula** to meet target saturations
  - Discontinue oxygen where $SpO_2$ > 90%

- Assess BGL (do not delay transport)
- If BGL < 2.6 mmol/L, consult with PIPER for administration of **10% Dextrose or Glucagon**

# Newborn Baby: APGAR scoring system



**APGAR scores 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.

A score of:

**7 – 10** Satisfactory
**4 – 6** Moderate depression and may need ongoing respiratory support (IPPV)
**0 – 3** Newborn requiring ongoing resuscitation (including ETT and drug therapy)

| | 0 points | 1 point | 2 points |
|---|---|---|---|
| **Appearance** | Blue, pale | Body pink, extremities blue | Totally pink |
| **Pulse** | Absent | < 100 | > 100 |
| **Grimace** | None | Grimaces | Cries |
| **Activity** | Limp | Flexion of extremities | Active motion |
| **Respiratory effort** | Absent | Weak, gasping or ineffective | Good strong cry |

# Drug Presentation

The pharmacology section of these CPGs has been specifically written to focus on the pharmacology relevant to selected medical emergencies. It is not intended that this section be seen as a standard text on pharmacology, therefore the content has been restricted to the context of prehospital practice.

| | |
|---|---|
| **Presentation** | In many instances, drugs may be available in presentations other than those listed. This book indicates drug presentations that are currently available within AV. |
| **Pharmacology** | A statement is included as to the nature of the drug followed by a list of specific actions related to the prehospital use of that drug. |
| **Metabolism** | A statement has been included to indicate the fate of the particular drug within the body. |
| **Primary emergency indications** | The emergency situations in which the drug is primarily used within prehospital practice. The drug may have other indications within health care. |
| **Contraindications** | Absolute contraindications to the use of a particular drug are listed in this section. |
| **Precautions** | Relative contraindications or precautions to the use of a particular of a drug are listed in this section. |
| **Route of administration** | Most drugs can be administered by a variety of routes. This section lists only those routes of administration considered appropriate for use in prehospital practice. As a general principle, drugs should not be mixed in the same syringe or solution before administration. |
| **Side effects** | Common side effects attributed to the use of the drug are included in this section. |
| **Special notes** | In this section a variety of additional information has been included as background information. In particular, the time that the drug takes to have its effect. |

# Adenosine



| | |
|---|---|
| **Presentation** | 6 mg in 2 mL glass ampoule |
| **Pharmacology** | A naturally occurring purine nucleoside found in all body cells<br>Actions:<br>- 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<br>**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)<br>**2.** AF<br>**3.** Atrial flutter<br>**4.** Ventricular tachyarrhythmias<br>**5.** Known hypersensitivity |
| **Precautions** | **1.** Adenosine may provoke bronchospasm in the asthmatic patient<br>**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 |

# Adenosine



| | |
|---|---|
| **Side effects** | Usually brief and transitory<br>Transient arrhythmia (including asystole, bradycardia or ventricular ectopy) may be experienced following reversion<br>Chest pain<br>Dyspnoea<br>Headache or dizziness<br>Nausea<br>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<br>Intravenous effects:<br>Duration: < 10 seconds |

# Adrenaline



| | |
|---|---|
| **Presentation** | 1 mg in 1 mL glass ampoule (1:1,000)<br>1 mg in 10 mL glass ampoule (1:10,000) |
| **Pharmacology** | A naturally occurring alpha and beta-adrenergic stimulant<br>Actions:<br>- Increases HR by increasing SA node firing rate (Beta 1)<br>- Increases conduction velocity through the A-V node (Beta 1)<br>- Increases myocardial contractility (Beta 1)<br>- Increases the irritability of the ventricles (Beta 1)<br>- Causes bronchodilatation (Beta 2)<br>- 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<br>**2.** Inadequate perfusion (cardiogenic or non-cardiogenic/non-hypovolaemic)<br>**3.** Bradycardia with poor perfusion<br>**4.** Anaphylaxis<br>**5.** Severe asthma - imminent life threat not responding to nebulised therapy, or unconscious with no BP<br>**6.** Croup |
| **Contraindications** | Hypovolaemic shock without adequate fluid replacement |

# Adrenaline



| | |
|---|---|
| **Precautions** | Consider reduced doses for:<br>**1.** Elderly / frail patients<br>**2.** Patients with cardiovascular disease<br>**3.** Patients on monoamine oxidase inhibitors<br>**4.** Higher doses may be required for patients on beta blockers |
| **Route of administration** | IV<br>IM<br>Nebulised<br>IV infusion<br>IO |
| **Side effects** | Sinus tachycardia<br>Supraventricular arrhythmias<br>Ventricular arrhythmias<br>Hypertension<br>Pupillary dilatation<br>May increase size of MI<br>Feeling of anxiety/palpitations in the conscious patient |
| **Special notes** | IV **Adrenaline** should be reserved for life threatening situations.<br>IV effects:<br>Onset: 30 seconds<br>Peak: 3 – 5 minutes<br>Duration: 5 – 10 minutes<br>IM effects:<br>Onset: 30 – 90 seconds<br>Peak: 4 – 10 minutes<br>Duration: 5 – 10 minutes |

# Amiodarone

## CPG D003

| | |
|---|---|
| **Presentation** | 150 mg in 3 mL glass ampoule |
| **Pharmacology** | Class III anti-arrhythmic agent |
| **Metabolism** | By the liver |
| **Primary emergency indications** | **1.** VF / pulseless VT refractory to cardioversion<br>**2.** Sustained or recurrent VT |
| **Contraindications** | **1.** VF / pulseless VT refractory to cardioversion<br>- Nil of significance in above indication<br>**2.** VT<br>- Pregnancy<br>**3.** TCA OD<br>**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<br>Bradycardia |
| **Special notes** | IV effects (bolus):<br>Onset: 2 minutes<br>Peak: 20 minutes<br>Duration: 2 hours<br>**Amiodarone is incompatible with normal saline. Glucose 5% must be used as diluent when preparing an IV infusion.**<br>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. |

# Aspirin



| | |
|---|---|
| **Presentation** | 300 mg chewable tablets<br>300 mg soluble or water dispersible tablets |
| **Pharmacology** | An analgesic, antipyretic, anti-inflammatory and antiplatelet aggregation agent<br>Actions:<br>- To minimise platelet aggregation and thrombus formation in order to retard the progression of coronary artery thrombosis in ACS<br>- 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** | ACS |
| **Contraindications** | **1.** Hypersensitivity to aspirin / salicylates<br>**2.** Actively bleeding peptic ulcers<br>**3.** Bleeding disorders<br>**4.** Suspected dissecting aortic aneurysm<br>**5.** Chest pain associated with psychostimulant OD if SBP >160 mmHg |
| **Precautions** | **1.** Peptic ulcer<br>**2.** Asthma<br>**3.** Patients on anticoagulants |
| **Route of administration** | Oral |
| **Side effects** | Heartburn, nausea, gastrointestinal bleeding<br>Increased bleeding time<br>Hypersensitivity reactions |
| **Special notes** | Aspirin is C/I for use in acute febrile illness in children and adolescents<br>The anti-platelet effects of Aspirin persist for the natural life of platelets.<br>Onset: n/a<br>Peak: n/a<br>Duration: 8 - 10 days |

# Atropine

## CPG D004

| | |
|---|---|
| **Presentation** | 0.6 mg in 1 mL polyamp<br>1.2 mg in 1 mL polyamp |
| **Pharmacology** | An anticholinergic agent<br>Actions:<br>- 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:<br>- increase heart rate by increasing SA node firing rate<br>- increase the conduction velocity through the A-V node<br>- antidote to reverse the effects of cholinesterase inhibitors, (e.g. organophosphate insecticides) at the post-ganglionic neuro-effector sites of cholinergic nerves to:<br>- reduce the excessive salivary, sweat, GIT and bronchial secretions; and<br>- relax smooth muscles |
| **Metabolism** | By the liver; excreted mainly by the kidneys |
| **Primary emergency indications** | **1.** Unstable bradycardia<br>**2.** Organophosphate poisoning with excessive cholinergic effects<br>**3.** Hypersalivation as a side effect of ketamine |
| **Contraindications** | **1.** Previous heart transplant |
| **Precautions** | **1.** Atrial flutter<br>**2.** AF<br>**3.** Do not increase HR above 100 bpm except in children under 6 years<br>**4.** Glaucoma |

# Atropine



| | |
|---|---|
| **Route of administration** | IV |
| **Side effects** | Tachycardia<br>Palpitations<br>Dry mouth<br>Dilated pupils<br>Visual blurring<br>Retention of urine<br>Confusion, restlessness (in large doses)<br>Hot, dry skin (in large doses) |
| **Special notes** | IV effects:<br>Onset: < 2 minutes<br>Peak: < 5 minutes<br>Duration: 2 - 6 hours 10 mL flush of Normal Saline must be administered after **Atropine** if **Adrenaline** is to also be administered. |

# Ceftriaxone



| | |
|---|---|
| **Presentation** | 1 g sterile powder in a glass vial |
| **Pharmacology** | Cephalosporin antibiotic |
| **Metabolism** | Excreted unchanged in urine (33% - 67%) and in bile |
| **Primary emergency indications** | **1.** Suspected meningococcal septicaemia<br>**2.** Severe sepsis (consult only) |
| **Contraindications** | **1.** Allergy to Cephalosporin antibiotics |
| **Precautions** | **1.** Allergy to Penicillin antibiotics |
| **Route of administration** | IV (preferred)<br>IM (if IV access unavailable) |
| **Side effects** | Nausea<br>Vomiting<br>Skin rash |
| **Special notes** | Usual dose: adult 1 g, child 50 mg/kg (max. 1 g)<br>**Ceftriaxone** IV must be made up to 10 mL using sterile water and dose administered over 2 minutes<br>**Ceftriaxone** IM must be made up to 4 mL using **1% Lignocaine** and dose administered in lateral upper thigh<br>IM/IV effects:<br>Onset: n/a<br>Peak: n/a<br>Duration: n/a |

# Dexamethasone

## CPG D007

| | |
|---|---|
| **Presentation** | 8 mg in 2 mL glass vial |
| **Pharmacology** | A corticosteroid secreted by the adrenal cortex<br>Actions:<br>- Relieves inflammatory reactions<br>- 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**<br>**2.** Moderate - severe croup<br>**3.** Acute exacerbation of COPD |
| **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<br>IV effects:<br>Onset: 30 - 60 minutes<br>Peak: 2 hours<br>Duration: 36 - 72 hours |

# Dextrose 5%

## CPG D008

| | |
|---|---|
| **Presentation** | 100 mL infusion soft pack |
| **Pharmacology** | An isotonic crystalloid solution<br>Composition:<br>- Sugar – 5% dextrose<br>- Water<br>Actions:<br>- Provides a small source of energy<br>- Supplies body water |
| **Metabolism** | Dextrose:<br>- Broken down in most tissues<br>- Stored in the liver and muscle as glycogen<br>Water:<br>- Excreted by the kidneys<br>- 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 |

# Dextrose 10%

## CPG D009

| | |
|---|---|
| **Presentation** | 25 g in 250 mL infusion soft pack |
| **Pharmacology** | A slightly hypertonic crystalloid solution<br>Composition:<br>- Sugar - 10% dextrose<br>- Water<br>Actions:<br>- Provides a source of energy<br>- Supplies body water |
| **Metabolism** | Dextrose:<br>- Broken down in most tissues<br>- Stored in liver and muscle as glycogen<br>Water:<br>- Excreted by the kidneys<br>- 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:<br>Onset: 3 minutes<br>Peak: n/a<br>Duration: Depends on severity of hypoglycaemic episode |

# Fentanyl



| | |
|---|---|
| **Presentation** | 100 mcg in 2 mL glass ampoule<br>250 mcg in 1 mL glass ampoule or cartridge (IN use only) |
| **Pharmacology** | A synthetic opioid analgesic<br>Actions:<br>CNS effects:<br>- Depression – leading to analgesia<br>- Respiratory depression – leading to apnoea<br>- Dependence (addiction)<br>Cardiovascular effects:<br>- Decreases conduction velocity through the A-V node |
| **Metabolism** | By the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Sedation to facilitate intubation<br>**2.** Sedation to maintain intubation<br>**3.** Sedation to facilitate transthoracic pacing<br>**4.** Sedation to facilitate synchronised cardioversion<br>**5.** CPR interfering patient - ALS<br>**6.** Analgesia – IV/IN<br>- History of hypersensitivity or allergy to morphine<br>- Known renal impairment / failure<br>- Short duration of action desirable<br>- Hypotension<br>- Nausea and/or vomiting<br>- Severe headache |
| **Contraindications** | **1.** History of hypersensitivity<br>**2.** Late second stage of labour |

# Fentanyl

| | |
|---|---|
| **Precautions** | **1.** Elderly/frail patients<br>**2.** Impaired hepatic function<br>**3.** Respiratory depression, e.g. COPD<br>**4.** Current asthma<br>**5.** Patients on monoamine oxidase inhibitors<br>**6.** Known addiction to opioids<br>**7.** Rhinitis, rhinorrhea or facial trauma (IN route) |
| **Route of administration** | IV<br>IN<br>IV infusion |
| **Side effects** | Respiratory depression<br>Apnoea<br>Rigidity of the diaphragm and intercostal muscles<br>Bradycardia |
| **Special notes** | **Fentanyl** is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility<br>Respiratory depression can be reversed with **Naloxone**<br>100 mcg **Fentanyl** is equivalent in analgesic activity to 10 mg **Morphine**<br>IV effects:<br>Onset: Immediate<br>Peak: < 5 minutes<br>Duration: 30 - 60 minutes<br>IN effects:<br>Peak: 2 minutes |

# Furosemide

## CPG D011

| | |
|---|---|
| **Presentation** | 40 mg in 4 mL glass ampoule |
| **Pharmacology** | A diuretic<br>Actions:<br>- Causes venous dilatation and reduces venous return<br>- Promotes diuresis |
| **Metabolism** | Excreted by the kidneys |
| **Primary emergency indications** | **1.** Consider in cardiogenic acute pulmonary oedema |
| **Contraindications** | **1.** Nil of significance in the above indication |
| **Precautions** | **1.** Hypotension |
| **Route of administration** | IV |
| **Side effects** | Hypotension |
| **Special notes** | The effect of vasopressor drugs will often be reduced after treatment with **Furosemide.**<br>IV effects:<br>Onset: 5 minutes<br>Peak: 20 - 60 minutes<br>Duration: 2 - 3 hours |

# Glucagon



| | |
|---|---|
| **Presentation** | 1 mg (IU) in 1 mL hypokit |
| **Pharmacology** | A hormone normally secreted by the pancreas<br>Actions:<br>– 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).<br>IM effects:<br>Onset: 5 minutes<br>Peak: n/a<br>Duration: 25 minutes |

# Glyceryl Trinitrate (GTN)



| | |
|---|---|
| **Presentation** | 0.3 mg tablet<br>0.6 mg tablets<br>Transdermal GTN Patch (50 mg 0.4 mg/hr release) |
| **Pharmacology** | Principally, a vascular smooth muscle relaxant<br>Actions:<br>- Venous dilatation promotes venous pooling and reduces venous return to the heart (reduces preload)<br>- Arterial dilatation reduces systemic vascular resistance and arterial pressure (reduces afterload)<br>The effects of the above are:<br>- Reduced myocardial $O_2$ demand<br>- Reduced systolic, diastolic and mean arterial blood pressure, whilst usually maintaining coronary perfusion pressure<br>- Mild collateral coronary arterial dilatation may improve blood supply to ischaemic areas of myocardium<br>- Mild tachycardia secondary to slight fall in blood pressure<br>- Preterm labour: Uterine quiescence in pregnancy |
| **Metabolism** | By the liver |
| **Primary emergency indications** | **1.** Chest pain with ACS<br>**2.** Acute LVF<br>**3.** Hypertension associated with ACS<br>**4.** Autonomic dysreflexia<br>**5.** Preterm labour (consult) |

# Glyceryl Trinitrate (GTN)

| | |
|---|---|
| **Contraindications** | **1.** Known hypersensitivity<br>**2.** Systolic blood pressure < 110 mmHg tablet<br>**3.** Systolic blood pressure < 90 mmHg patch<br>**4.** Sildenafil Citrate (Viagra) or Vardenafil (Levitra) administration in the previous 24 hr or Tadalafil (Cialis) administration in the previous 4 days (PDE5 inhibitors)<br>**5.** Heart rate > 150 bpm<br>**6.** Bradycardia HR < 50 bpm (excluding autonomic dysreflexia)<br>**7.** VT<br>**8.** Inferior STEMI with systolic BP < 160 mmHg<br>**9.** Right ventricular MI |
| **Precautions** | **1.** No previous administration<br>**2.** Elderly patients<br>**3.** Recent MI<br>**4.** Concurrent use with other tocolytics |
| **Route of administration** | SL<br>Buccal<br>Transdermal<br>Infusion (interhospital transfer only) |
| **Side effects** | Tachycardia<br>Hypotension<br>Headache<br>Skin flushing (uncommon)<br>Bradycardia (occasionally) |

# Glyceryl Trinitrate (GTN)



**Special notes**

Storage:

- 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.
- Do not administer patient's own tablets, as its storage may not have been in optimum conditions or it may have expired.
- Patches should be discarded prior to use-by date.
- 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.
- 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.
- GTN by IV infusion may be required for an interhospital transfer as per the treating doctor's orders.

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 |

# Heparin



| | |
|---|---|
| **Presentation** | 5000 units in 5 mL plastic ampoule |
| **Pharmacology** | Anticoagulant<br>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<br>**2.** Active bleeding (excluding menses)<br>**3.** Oral anticoagulants<br>**4.** Bleeding disorders<br>**5.** History of Heparin-Induced Thrombocytopaenia (HIT)<br>**6.** Severe hepatic impairment / disease, including oesophageal varices<br>**7.** Recent trauma or surgery (< 3 weeks) |
| **Precautions** | **1.** Renal impairment |
| **Route of Administration** | IV |
| **Side Effects** | **1.** Bleeding<br>**2.** Bruising and pain at injection site<br>**3.** Hyperkalaemia<br>**4.** Thrombocytopaenia (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 nebule or polyamp |
| **Pharmacology** | Anticholinergic bronchodilator<br>Actions:<br>- 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<br>**2.** Exacerbation of COPD irrespective of severity |
| **Contraindications** | **1.** Known hypersensitivity to **Atropine** or its derivatives |
| **Precautions** | **1.** Glaucoma<br>**2.** Avoid contact with eyes |
| **Route of administration** | Nebulised (in combination with Salbutamol) |
| **Side effects** | Headache<br>Nausea<br>Dry mouth<br>Skin rash<br>Tachycardia (rare)<br>Palpitations (rare)<br>Acute angle closure glaucoma secondary to direct eye contact (rare) |

# Ipratropium Bromide



| | |
|---|---|
| **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.<br>The nebuliser mask must therefore be fitted properly during inhalation and care taken to avoid **Ipratropium Bromide** solution entering the eyes.<br>**Ipratropium Bromide** must be nebulised in conjunction with **Salbutamol** and is to be administered as a single dose only.<br>Onset: 3 - 5 minutes<br>Peak 1.5 - 2 hours<br>Duration: 6 hours |

# Ketamine



| | |
|---|---|
| **Presentation** | 200 mg in 2 mL ampoule |
| **Pharmacology** | A rapid acting dissociative anaesthetic agent (primarily an NMDA receptor antagonist)<br>Actions:<br>- Produces a dissociative state characterised by:<br>- a trance-like state with eyes open but not responsive<br>- nystagmus<br>- profound analgesia<br>- normal pharyngeal and laryngeal reflexes<br>- normal or slightly enhanced skeletal muscle tone<br>- occasionally a transient and minimal respiratory depression |
| **Metabolism** | By the liver and excreted by the kidneys |
| **Primary emergency indications** | **1.** Rapid sequence intubation<br>**2.** Extreme traumatic pain refractory to opioid analgesia<br>**3.** Extreme agitation<br>**4.** CPR interfering patient |
| **Contraindications** | **1.** Known hypersensitivity<br>**2.** Severe hypertension (SBP > 180) |
| **Precautions** | **1.** Any condition where significant elevation of BP would be hazardous, e.g<br>- Hypertension<br>- CVA<br>- Recent AMI<br>- CCF<br>**2.** If being administered for analgesia, inject slowly over 1 minute to minimise risk of respiratory depression and hypertension |

# Ketamine



| | |
|---|---|
| **Route of Administration** | IV<br>IO<br>IM |
| **Side Effects** | Cardiovascular<br>Increase in BP and HR<br>CNS<br>Respiratory depression or apnoea<br>Emergence reactions (nightmares, restlessness, vivid dreams, confusion, hallucinations, irrational behaviour)<br>Enhanced skeletal tone<br>Nausea and vomiting<br>Ocular<br>Diplopia and nystagmus with slight increase in intraocular pressure<br>Other<br>Local pain at injection site<br>Lacrimation<br>Hypersalivation |
| **Special Notes** | Emergence reactions, hallucinations or other behavioural disturbances associated with **Ketamine** administration for analgesia in adult patients may be managed with **Midazolam**<br>Consultation with the RCH is required to administer **Midazolam** in paediatric patients.<br>Hypersalivation may be managed with suctioning, or in severe cases IV or IM atropine (MICA only)<br>*IV effects:*<br>Onset: 30 seconds<br>Peak: N/A<br>Duration: 10 minutes<br>*IM effects:*<br>Onset: 3 - 4 minutes<br>Peak: N/A<br>Duration: 12 - 25 minutes |

# Lignocaine 1%



| | |
|---|---|
| **Presentation** | 50 mg in 5 mL amp (1%) |
| **Pharmacology** | A local anaesthetic agent<br>Actions:<br>- Prevents initiation and transmission of nerve impulses causing local anaesthesia (1% solution) |
| **Metabolism** | By the liver (90%)<br>Excreted unchanged by the kidneys (10%) |
| **Primary emergency indications** | **1.** Diluent for **Ceftriaxone** for IM administration in suspected meningococcal disease<br>**2.** Chest wall infiltration as local anaesthetic to facilitate chest decompression in patients with GCS >10 |
| **Contraindications** | **1.** Known hypersensitivity |
| **Precautions** | **1.** When using **Lignocaine 1%** under these indications it is important to rule out inadvertent IV administration due to potential CNS complications |
| **Route of administration** | IM (1% solution with **Ceftriaxone** only)<br>Local tissue infiltration for chest decompression (MICA only) |
| **Side effects** | Nil – unless inadvertent IV administration |
| **Special notes** | IM effects:<br>Onset: Rapid<br>Peak: n/a<br>Duration: 1 - 1.5 hours |

# Lignocaine 1% (IO administration)



| | |
|---|---|
| **Presentation** | 50 mg in 5 ml amp (1%) |
| **Pharmacology** | A local anaesthetic agent<br>Actions:<br>Prevents initiation and transmission of nerve impulses (local anaesthesia) |
| **Metabolism** | By the liver (90%)<br>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<br>**2.** Chronic LVF<br>**3.** Liver disease |
| **Route of administration** | IO |

# Lignocaine 1% (IO administration)



| | |
|---|---|
| **Side effects** | CNS effects (common):<br>- drowsiness<br>- disorientation<br>- decreased hearing<br>- blurred vision<br>- change or slurring of speech<br>- twitching and agitation<br>- convulsions<br>Cardiovascular effects (uncommon):<br>- hypotension<br>- bradycardia<br>- sinus arrest<br>- A-V block<br>Respiratory effects (uncommon):<br>- difficulty in breathing<br>- respiratory arrest |
| **Special notes** | IO effects<br>Onset: 1 – 4 minutes<br>Peak: 5 – 10 minutes<br>Duration: 20 minutes |

# Methoxyflurane



| | |
|---|---|
| **Presentation** | 3 mL glass bottle |
| **Pharmacology** | Inhalational analgesic agent at low concentrations |
| **Metabolism** | Excreted mainly by the lungs<br>By the liver |
| **Primary emergency indications** | **1.** Pain relief |
| **Contraindications** | **1.** Pre-existing renal disease / renal impairment<br>**2.** Concurrent use of tetracycline antibiotics<br>**3.** Exceeding total dose of 6 mL in a 24 hour period<br>**4.** Personal or family history of malignant hyperthermia<br>**5.** Muscular dystrophy |
| **Precautions** | **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<br>**2.** Pre-eclampsia<br>**3.** Concurrent use with Oxytocin may cause hypotension |
| **Route of administration** | Self-administration under supervision using the hand held Penthrox™ Inhaler |
| **Side effects** | Drowsiness<br>Decrease in blood pressure and bradycardia (rare)<br>Exceeding the maximum total dose of 6 mL in a 24 hour period may lead to renal toxicity |
| **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.<br>Do not administer in a confined space. Ensure adequate ventilation in ambulance.<br>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.<br>In patients with muscular dystrophy, volatile agents may precipitate life-threatening rhabdomyolysis. |

# Midazolam



| | |
|---|---|
| **Presentation** | 5 mg in 1 mL glass ampoule<br>15 mg in 3 mL glass ampoule |
| **Pharmacology** | Short acting CNS depressant<br>Actions:<br>- Anxiolytic<br>- Sedative<br>- Anti-convulsant |
| **Metabolism** | In the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Status epilepticus<br>**2.** Sedation to enable intubation (RSI / IFS)<br>**3.** Post intubation sedation<br>**4.** Sedation to facilitate synchronised cardioversion<br>**5.** Sedation to facilitate transthoracic pacing<br>**6.** Sedation in the agitated patient (including patients under the Mental Health Act 2014)<br>**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<br>**2.** The CNS depressant effects of benzodiazepines are enhanced in the presence of narcotics and other tranquillisers including alcohol<br>**3.** Can cause severe respiratory depression in patients with COPD<br>**4.** Patients with myasthenia gravis |

# Midazolam



| | |
|---|---|
| **Route of administration** | IM<br>IV<br>IV infusion |
| **Side effects** | Depressed level of consciousness<br>Respiratory depression<br>Loss of airway control<br>Hypotension |
| **Special notes** | IM effects:<br>Onset: 3 – 5 minutes<br>Peak: 15 minutes<br>Duration: 30 minutes<br>IV effects:<br>Onset: 1 – 3 minutes<br>Peak: 10 minutes<br>Duration: 20 minutes |

# Misoprostol

## CPG D030

| | |
|---|---|
| **Presentation** | 200 mcg tablet |
| **Pharmacology** | A synthetic prostaglandin<br>Actions:<br>Enhances uterine contractions |
| **Metabolism** | Converted to active metabolite misoprostol acid in the blood<br>Metabolised in the tissues and excreted by the kidneys |
| **Primary emergency indications** | **1.** Primary Postpartum Haemorrhage (PPH) |
| **Contraindications** | **1.** Allergy to prostaglandins<br>**2.** Exclude multiple pregnancy before drug administration |
| **Precautions** | **1.** History of asthma |
| **Route of administration** | Oral |
| **Side effects** | Hyperpyrexia<br>Shivering<br>Abdominal pain<br>Diarrhoea |
| **Special notes** | Side effects are more likely with > 600 mcg oral dose.<br>Onset: 8 –10 minutes<br>Peak: N/A<br>Duration: 2 – 3 hours |

# Morphine



| | |
|---|---|
| **Presentation** | 10 mg in 1 mL glass ampoule |
| **Pharmacology** | An opioid analgesic<br>Actions:<br>CNS effects:<br>- Depression (leading to analgesia)<br>- Respiratory depression<br>- Depression of cough reflex<br>- Stimulation (changes of mood, euphoria or dysphoria, vomiting, pin-point pupils)<br>- Dependence (addiction)<br>Cardiovascular effects:<br>- Vasodilatation<br>- Decreases conduction velocity through the A-V Node |
| **Metabolism** | By the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Pain relief<br>**2.** Sedation to maintain intubation<br>**3.** Sedation to enable intubation<br>**4.** RSI |
| **Contraindications** | **1.** History of hypersensitivity<br>**2.** Renal impairment / failure<br>**3.** Late second stage of labour |

# Morphine



| | |
|---|---|
| **Precautions** | **1.** Elderly/frail patients<br>**2.** Hypotension<br>**3.** Respiratory depression<br>**4.** Current asthma<br>**5.** Respiratory tract burns<br>**6.** Known addiction to opioids<br>**7.** Acute alcoholism<br>**8.** Patients on monoamine oxidase inhibitors |
| **Route of administration** | IV / IM / Subcutaneous |
| **Side effects** | CNS effects:<br>- Drowsiness<br>- Respiratory depression<br>- Euphoria<br>- Nausea, vomiting<br>- Addiction<br>- Pin-point pupils<br>Cardiovascular effects:<br>- Hypotension<br>- Bradycardia |
| **Special notes** | **Morphine** is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility.<br>Side effects of **Morphine** can be reversed with **Naloxone**.<br>Occasional wheals are seen in the line of the vein being used for IV injection. This is not an allergy, only a histamine release.<br>IV effects:<br>Onset: 2 – 5 minutes<br>Peak: 10 minutes<br>Duration: 1 – 2 hours<br>IM effects:<br>Onset: 10 – 30 minutes<br>Peak: 30 – 60 minutes<br>Duration: 1 – 2 hours |

# Naloxone

## CPG D021

| | |
|---|---|
| **Presentation** | 0.4 mg in 1 mL glass ampoule |
| **Pharmacology** | An opioid antagonist<br>Action:<br>- Prevents or reverses the effects of opioids |
| **Metabolism** | By the liver |
| **Primary emergency indications** | **1.** Altered conscious state and respiratory depression secondary to administration of opioids or related drugs |
| **Contraindications** | **1.** Nil of significance in the above indication |
| **Precautions** | **1.** If patient is known to be physically dependent on opioids, be prepared for a combative patient after administration<br>**2.** Neonates |
| **Route of administration** | IM<br>IV |
| **Side effects** | Symptoms of opioid withdrawal:<br>- Sweating, goose flesh, tremor<br>- Nausea and vomiting<br>- Agitation<br>- Dilatation of pupils, excessive lacrimation<br>- Convulsions |

# Naloxone



| | |
|---|---|
| **Special notes** | The duration of action of **Naloxone** is often less than that of the opioid used, therefore repeated doses may be required.<br>**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.<br>Following an opioid associated cardiac arrest **Naloxone** should not be administered. Maintain assisted ventilation.<br>Following head injury **Naloxone** should not be administered. Maintain assisted ventilation if required.<br>IV effects:<br>Onset: 1 – 3 minutes<br>Peak: n/a<br>Duration: 30 – 45 minutes<br>IM effects:<br>Onset: 1 – 3 minutes<br>Peak: n/a<br>Duration: 30 – 45 minutes |

# Normal Saline



| | |
|---|---|
| **Presentation** | 10 mL polyamp<br>500 mL and 1000 mL infusion soft pack |
| **Pharmacology** | An isotonic crystalloid solution<br>Composition:<br>- Electrolytes (sodium and chloride in a similar concentration to that of extracellular fluid)<br>Action:<br>- Increases the volume of the intravascular compartment |
| **Metabolism** | Electrolytes:<br>- Excreted by the kidneys<br>Water:<br>- Excreted by the kidneys<br>- Distributed throughout total body water, mainly in the extracellular fluid compartment |
| **Primary emergency indications** | **1.** As a replacement fluid in volume-depleted patients<br>**2.** Cardiac arrest secondary to hypovolaemia or where the patient may be fluid responsive<br>**3.** To expand intravascular volume in the non-cardiac, non-hypovolaemic hypotensive patient e.g. anaphylaxis, burns, sepsis<br>**4.** As a fluid challenge in unresponsive, non-hypovolaemic, hypotensive patients (other than LVF). e.g. asthma<br>**5.** Fluid for diluting and administering IV drugs<br>**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<br>IO |
| **Side effects** | Nil of significance in the above indication |
| **Special notes** | IV half life:<br>Approximately 30 – 60 minutes |

# Ondansetron

## CPG D037

| | |
|---|---|
| **Presentation** | 4 mg orally dissolving tablet<br>8 mg in 4 mL glass ampoule |
| **Pharmacology** | Anti-emetic<br>Action:<br>$5HT_3$ antagonist which blocks receptors both centrally and peripherally |
| **Metabolism** | By the liver |
| **Primary emergency indications** | **1.** Undifferentiated nausea and vomiting<br>**2.** Prophylaxis for spinally immobilised or eye injured patients<br>**3.** Vestibular nausea in patients < 21 years of age |
| **Contraindications** | **1.** Known hypersensitivity<br>**2.** Concurrent Apomorphine use<br>**3.** Known Long Q-T syndrome<br>**4.** Hypokalaemia or hypomagnesaemia |
| **Precautions** | **1.** Patients with liver disease should not receive more than 8 mg of Ondansetron per day<br>**2.** Care should be taken with patients on diuretics who may have an underlying electrolyte imbalance<br>**3.** Ondansetron contains aspartame and should not be given to patients with phenylketonuria<br>**4.** Concurrent use of Tramadol<br>**5.** Pregnancy |
| **Route of administration** | Oral (ODT), IV, IM |

# Ondansetron



| | |
|---|---|
| **Side effects** | *Rare (< 0.1%)*<br>Hypersensitivity reactions (including anaphylaxis)<br>Q-T prolongation<br>Widened QRS complex<br>Tachyarrythmias (including AF and SVT)<br>Seizures<br>Extrapyramidal reaction<br>Visual disturbances (including transient loss of vision)<br><br>*Common (> 1%)*<br>Constipation<br>Headache<br>Fever<br>Dizziness<br>Rise in liver enzymes |
| **Special notes** | **ODT**<br>Onset: 2 minutes<br>Peak: 20 minutes<br>Duration: 120 minutes<br><br>**IV**<br>Onset: 5 minutes<br>Peak: 10 minutes<br>Duration: between 2.5 and 6.1 hours<br>IV doses should be delivered as a slow push (minimum 30 seconds). |

# Oxytocin (Syntocinon)



| | |
|---|---|
| **Presentation** | 10 units (IU) in 1 mL glass ampoule |
| **Pharmacology** | A synthetic oxytocic<br>Action:<br>Stimulates smooth muscle of the uterus producing contractions |
| **Metabolism** | By the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Primary Postpartum Haemorrhage (PPH) |
| **Contraindications** | **1.** Previous hypersensitivity<br>**2.** Severe toxaemia (pre-eclampsia)<br>**3.** Exclude multiple pregnancy before drug administration<br>**4.** Cord prolapse |
| **Precautions** | **1.** If given IV may cause transient hypotension<br>**2.** Concurrent use with **Methoxyflurane** may cause hypotension |
| **Route of administration** | IM |
| **Side effects** | Uncommon via IM route:<br>Tachycardia<br>Bradycardia<br>Nausea |

# Oxytocin (Syntocinon)



| | |
|---|---|
| **Special notes** | Concomitant use with prostaglandins (**Misoprostol**) may potentiate uterotonic effect<br>**Must be stored between 2 - 8ºC**<br><br>IM effects:<br>Onset: 2 – 4 minutes<br>Peak: n/a<br>Duration: 30 – 60 minutes |

# Paracetamol

## CPG D036

| | |
|---|---|
| **Presentation** | 500 mg tablets<br>120 mg in 5 mL oral liquid (24 mg/mL) |
| **Pharmacology** | An analgesic and antipyretic agent<br><br>*Actions:*<br>- 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<br>**2.** Headache |
| **Contraindications** | **1.** Hypersensitivity to paracetamol<br>**2.** Children < 1 month of age<br>**3.** Paracetamol already administered within past 4 hours<br>**4.** Total paracetamol intake within past 24 hours exceeding 4 g (adults) or 60 mg/kg (children)<br>**5.** Chest pain in suspected acute coronary syndrome |
| **Precautions** | **1.** Impaired hepatic function or liver disease<br>**2.** Elderly / frail<br>**3.** Malnourished |
| **Route of administration** | Oral |

# Paracetamol



| | |
|---|---|
| **Side effects** | 1. Hypersensitivity reactions including severe skin rashes (rare)<br>2. Haematological reactions (rare) |
| **Special notes** | There are several brands of **Paracetamol** available in Australia. **Paracetamol** is also found in many combination medicines, both prescription and over-the counter. Carefully determine previous **Paracetamol** intake before dose administration.<br>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.<br>Hepatic damage is very rare when **Paracetamol** is taken at recommended dosages.<br>**Paracetamol** is not indicated for the treatment of fever in the emergency setting.<br><br>Onset: 30 minutes<br>Peak:<br>Duration: 4 hours |

# Prochlorperazine (Stemetil)



| | |
|---|---|
| **Presentation** | 12.5 mg in 1 mL glass ampoule |
| **Pharmacology** | An anti-emetic<br>Action:<br>- Acts on several central neuro-transmitter systems |
| **Metabolism** | Metabolised by the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Treatment or prophylaxis of nausea / vomiting for<br>- Motion sickness<br>- Planned aeromedical evacuation<br>- Known allergy or C/I to **Ondansetron** administration<br>- Headache irrespective of nausea / vomiting<br>- Vertigo |
| **Contraindications** | **1.** Circulatory collapse (cool, pale, clammy skin, tachycardia, hypotension)<br>**2.** CNS depression<br>**3.** Previous hypersensitivity<br>**4.** Patients < 21 years of age<br>**5.** Pregnancy |
| **Precautions** | **1.** Hypotension<br>**2.** Epilepsy<br>**3.** Pts affected by alcohol or on anti-depressants |
| **Route of administration** | IM |

# Prochlorperazine (Stemetil)



| | |
|---|---|
| **Side effects** | Drowsiness<br>Blurred vision<br>Hypotension<br>Sinus tachycardia<br>Skin rash<br>Extrapyramidal reactions (usually the dystonic type) |
| **Special notes** | IM effects<br>Onset: 20 minutes<br>Peak: 40 minutes<br>Duration: 6 hours |

# Rocuronium

**CPG D039**

| | |
|---|---|
| **Presentation** | 50 mg in 5 mLs glass vial |
| **Pharmacology** | A non-depolarising neuromuscular blocking agent<br>Actions:<br>- Fast onset medium acting muscle relaxant |
| **Metabolism** | Primarily eliminated by the liver |
| **Primary emergency indications** | 1. Maintenance of paralysis, once tracheal intubation is confirme with waveform capnography<br>2. **AAV only** – As part of rapid sequence induction when the use of Suxamethonium is contraindicated |
| **Contraindications** | 1. Known hypersensitivity<br>2. Status epilepticus (consult with receiving hospital if paralysis of a seizing patient is required for patient safety reasons)<br>**3. IT IS CONTRAINDICATED FOR ANYONE OTHER THAN MICA FLIGHT PARAMEDICS TO ADMINISTER ROCURONIUM BEFORE TRACHEAL PLACEMENT OF THE ETT IS CONFIRMED** |
| **Precautions** | 1. Sedatives must always be administered prior to Rocuronium<br>2. ETT placement, adequacy of ventilation, SpO2, EtCO2, HR and BP must be continuously monitored |
| **Route of administration** | IV<br>IO |
| **Side effect** | 1. Allergic reactions (including anaphylaxis <0.1% of all patients)<br>2. Tachycardia |
| **Special notes** | Rocuronium has a shorter duration than Pancuronium. Repeat doses are administered prior to the previous dose reaching full duration in order to prevent paralysis wearing off and any problems that may arise as a result, e.g. asynchronous ventilation, rise in ICP, etc.<br>Onset: 1 minute<br>Peak:<br>Duration: 20 minutes |

# Salbutamol



| | |
|---|---|
| **Presentation** | 5 mg in 2.5 mL polyamp<br>pMDI (100 mcg per actuation) |
| **Pharmacology** | A synthetic beta adrenergic stimulant with primarily beta 2 effects<br>Action:<br>- Causes bronchodilatation |
| **Metabolism** | By the liver; excreted by the kidneys |
| **Primary emergency indications** | **1.** Respiratory distress with suspected bronchospasm:<br>- asthma<br>- severe allergic reactions<br>- COPD<br>- smoke inhalation<br>- 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<br>pMDI |

# Salbutamol

| | |
|---|---|
| **Side effects** | Sinus tachycardia<br>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<br>Although infrequently used, **Salbutamol** by IV infusion may be required during interhospital transfers of some women in premature labour<br>The dose is to be prescribed and signed by the referring hospital medical officer<br>Nebulised effects:<br>Onset: 5 – 15 minutes<br>Peak: n/a<br>Duration: 15 – 50 minutes |

# Sodium Bicarbonate 8.4%

## CPG D026

| | |
|---|---|
| **Presentation** | 50 mL prepared syringe<br>100 mL glass bottle |
| **Pharmacology** | A hypertonic crystalloid solution<br>Composition:<br>- Contains sodium and bicarbonate ions in a solution of high pH<br>Action:<br>- Raises pH |
| **Metabolism** | Sodium: excreted by the kidneys<br>Bicarbonate: excreted by the kidneys as bicarbonate ion and by the lungs as $CO_2$ |
| **Primary emergency indications** | **1.** Cardiac arrest secondary to TCA overdose or hyperkalaemia<br>**2.** Symptomatic TCA OD |
| **Contraindications** | **1.** Hypothermia < 30°C |
| **Precautions** | **1.** Administration of **Sodium Bicarbonate 8.4%** must be accompanied by effective ventilation and ECC if required<br>**2.** Since **Sodium Bicarbonate 8.4%** causes tissue necrosis, care must be taken to avoid leakage of the drug into the tissues<br>**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 |

# Sodium Bicarbonate 8.4%



| | |
|---|---|
| **Side effects** | Sodium overload may provoke pulmonary oedema<br>Excessive doses of **Sodium Bicarbonate 8.4%**, especially without adequate ventilation and circulation, may cause an intracellular acidosis |
| **Special notes** | IV effects:<br>Onset: 1 – 2 minutes<br>Peak: n/a<br>Duration: Depends on cause and patient's perfusion |

# Suxamethonium

## CPG D027

| | |
|---|---|
| **Presentation** | 100 mg in 2 mL polyamp |
| **Pharmacology** | Depolarising neuromuscular blocking agent<br>Actions:<br>- Short acting muscular relaxant |
| **Metabolism** | Pseudo-cholinesterase in plasma |
| **Primary emergency indications** | **1.** Complete muscle relaxation to allow endotracheal intubation |
| **Contraindications** | **1.** Known hypersensitivity<br>**2.** Upper airway obstruction<br>**3.** Penetrating eye injury<br>**4.** ECG signs of hyperkalaemia in conditions such as muscle necrosis and renal failure<br>**5.** Burns > 24 hours post injury<br>**6.** Organophosphate poisoning<br>**7.** Ruptured AAA<br>**8.** Known history of **Suxamethonium** apnoea<br>**9.** Personal or family history of malignant hyperthermia |
| **Precautions** | **1.** Liver disease<br>**2.** Elderly patients<br>**3.** Crush injuries<br>**4.** Patients who have not fasted<br>**5.** Airway trauma |
| **Route of administration** | IV<br>IO |

# Suxamethonium



| | |
|---|---|
| **Side effects** | Muscular fasciculation<br>Increased intraocular pressure<br>Increased intragastric pressure<br>Elevated serum potassium levels |
| **Special notes** | Sedation is required prior to use<br>**Atropine** 600 mcg should be administered prior to **Suxamethonium** administration in adult patients with a HR < 60<br>**Atropine** 20 mcg/kg should be administered prior to **Suxamethonium** administration in children<br>A second dose of **Suxamethonium** usually causes profound bradycardia<br>Refrigeration of **Suxamethonium** is required - requires weekly rotation or disposal when not refrigerated<br>Usual dosage:<br>Adults: 1.5 mg/kg IV: (max. dose 150mg)<br>IV effects:<br>Onset: 20 - 40 seconds<br>Peak: 60 seconds<br>Duration: 4 - 6 minutes |

# Tenecteplase (Metalyse)



| | |
|---|---|
| **Presentation** | 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) |
| **Pharmacology** | Fibrinolytic, a modified form of tissue plasminogen activator (tPA) that binds to fibrin and converts plasminogen to plasmin |
| **Metabolism** | Metabolised by the liver |
| **Primary Emergency Indications** | **1.** Acute STEMI |
| **Contraindications (Exclusion criteria)** | **1.** Major surgery in the past 3 months<br>**2.** Significant head injury in the past 3 months<br>**3.** Major trauma in the past 3 months<br>**4.** Stroke/TIA in the past 3 months<br>**5.** ICH at any time<br>**6.** GI or genitourinary bleed in the past month<br>**7.** Current bleeding disorder, active bleeding (excluding menses) or bleeding tendencies<br>**8.** Anticoagulants or glycoprotein IIb/IIIa inhibitors<br>**9.** Allergy to tenecteplase or gentamicin |

# Tenecteplase (Metalyse)



| | |
|---|---|
| **Precautions (Relative contraindications)** | **1.** Age ≥ 75 years<br>**2.** Non-compressible vascular puncture<br>**3.** History of liver disease<br>**4.** SBP > 160 mmHg or DBP > 110 mmHg<br>**5.** Low body weight<br>**6.** Active peptic ulcer<br>**7.** Anaemia<br>**8.** Acute pericarditis or subacute bacterial endocarditis<br>**9.** Traumatic or prolonged (>10 mins) CPR<br>**10.** Pregnant or within 1 week post-partum<br>**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** | Bleeding – including injection sites, ICH, internal bleeding<br>Transient hypotension<br>**Infrequent**<br>- Allergic reactions including fever, chills, rash, nausea, headache, bronchospasm, vasculitis, nephritis and anaphylaxis<br>**Rare**<br>- Cholesterol embolism |
| **Special Notes** | Weight optimised dosing improves efficacy and safety outcomes in drugs with narrow therapeutic index e.g. Fibrinolytics<br>Other drugs which affect the clotting process may increase risk of bleeding associated with Tenecteplase. |

# Water for Injection



| | |
|---|---|
| **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 |

# Further Information

## Miscarriage

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 p ehospital 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 p omises 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  egards to the viability of the pregnancy.

# Further Information

## Miscarriage (continued)

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).

# Further Information

## Alternative drug administration route

### 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 a e 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 th ough an IO cannula.

### Local anaesthesia

- If patient conscious, administer IO Lignocaine 1% local anaesthesia slowly prior to infusing drugs/flui 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)**

# Further Information

## OG / NG tube

- 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

# Further Information

## Interhospital transfers

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 o  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 practioner 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 decisio made.

# Further Information

**Interhospital transfers (continued)**

**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 Parame ic), or provision of an escort should be sought by contacting the AV Clinician.

# Further Information

## Interhospital transfers (continued)

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 NSTEACS 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 hi 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.

# Further Information

## 4. Interhospital transfer of other patients

Patients may require IV fluids as part of their management during transport. Some nfusions 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

| | |
|---|---|
| Paediatric Infant Perinatal Emergency Retrieval (PIPER) (previously NETS, PETS and PERS) | **PH 1300 137 650** |
| Adult Retrieval Victoria (ARV) | **PH 1300 368 661** |

# Further Information

## Family Violence

### Key Information

**Recognise**

- 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?

**Respond**

- Request Police attendance for immediate dangers
- Treat patient as per appropriate CPG

**Refer**

- Transport patient to the ED
- *Report* to Police or DHS Child protection as appropriate
- *Refer* to support service as appropriate

### Key Numbers

| | |
|---|---|
| Victoria Police | 000 |
| 1800 Respect (sexual assault, domestic and family violence) | 24 hr service – 1800 737 732 |
| Safe Steps (family violence) | 24 hr service – 1800 015 188 |
| CASA (sexual assault) | after hours – 1800 806 292 |
| Seniors Rights Victoria (elder abuse) | 10am-5pm M-F – 1300 368 821 |

# Further Information

## Family Violence

### Introduction

- 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 lder 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, Respond and Refer

#### 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.

# Further Information

## Family Violence

- 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 difficultie
- 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 specifi 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.

# Further Information

## Family Violence

### 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 Information

## Family Violence

### Further Referal 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 p ovided 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 identifica ion 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.

# Further Information

## Family Violence

### 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. T**hese 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:

| | |
|---|---|
| 1800 Respect (sexual assault, domestic and family violence) | 24 hr service – 1800 737 732 |
| Safe Steps (family violence) | 24 hr service – 1800 015 188 |
| CASA (sexual assault) | after hours – 1800 806 292 |
| Seniors Rights Victoria (elder abuse) | 10am-5pm M-F – 1300 368 821 |
| Victoria Police | 000 |

### 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.

# Further Information

## Sudden unexpected death of an infant or child

- 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).**

# Further Information

## Verbal de-escalation strategies

- 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 calculation

| | | |
|---|---|---|
| Standard giving set: | 20 drops | = 1 mL |
| Microdrip set: | 60 microdrops | = 1 mL |

$$\text{Drops per minute} = \frac{\text{Drops per mL} \times \text{volume}}{\text{time}}$$

$$\text{Volume to give} = \frac{\text{Strength required} \times \text{volume}}{\text{Strength in stock}}$$

# Further Information

## Drug dilutions

| CPG | Dilution | Description |
|---|---|---|
| **A0401**<br>**P0501** | **Morphine increments** | Dilute **Morphine 10 mg** to 10 mL with **9 mL Normal Saline** |
| **A0404** | **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)<br>**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)<br>**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**<br>**A0407**<br>**A0705** | **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**)<br>**Adrenaline Infusions** must be clearly labelled with the name and dose of the additive drug and time of commencement |
| **A0402**<br>**A0407**<br>**A0705** | **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**<br>**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).<br>Do not dilute for IM injection |

# Further Information

## Drug dilutions - Paediatric

| CPG | Dilution | Description |
|---|---|---|
| **P0704** | **Adrenaline infusion (Paed)** | **Syringe pump**<br>**Adrenaline 300 mcg** added to make **50 mL** with **5% Dextrose** or **Normal Saline**<br>1 mL = 6 mcg<br>1 mL/hr = 0.1 mcg/min<br>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<br>≥ 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**) |

# Further Information

## Peer Support

### 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.


### 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

# Further Information

## Telephone Interpreting Service (TIS)

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 the Client Code number of **C503484**

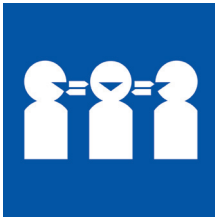
Name of Paramedic may be requested by interpreter service operator

### 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  esource centres and housing offices



# Further Information

## Summary of approved changes

The following changes have been introduced since the 2016 edition of the CPGs.

| CPG | CPG title | Amendment summary |
|---|---|---|
| **A0105** | **Time Critical Guidelines (Trauma Triage)** | • Revised to include GCS < 15 and > 10% TBSA burns as major trauma criteria for patients aged 12 – 15 years |
| **A0201** | **Cardiac Arrest** | • Introduction of a traumatic cardiac arrest CPG including the introduction of needle decompression for suspected pneumothorax to all ALS paramedics<br>• Rhythm analysis in AED mode only<br>• Change adrenaline administration to 1 mg every four (4) minutes<br>• Sodium Bicarbonate administration limited to hyperkalaemia and tricyclic overdose associated arrests<br>• ALS paramedic insertion of gastric tube via LMA<br>• Change to medication / cardioversion requirements in the hypothermic patient<br>• Sedation for CPR interfering patients<br>• ETCO2 monitoring by ALS during CPR<br>• Recommendations on use of mechanical CPR<br>• Recommend BSL testing<br>• ETT adrenaline removed |
| **A0202** | **Cardiac Arrest (ROSC Management)** | • Revised target SBP of 100 mmHg<br>• Maximum adrenaline infusion rate of 250 mcg/min<br>• Post arrest transport destination to PCI centre (if possible)<br>• ETCO2 target range changed to 30 – 40 mmHg |
| **A0301** | **Laryngeal Mask Airway** | • Renamed CPG to Supra–Glottic Airway (SGA)<br>• Sedation to facilitate SGA where it has been used as a rescue airway under CPG A0303 |
| **A0302** | **Endotracheal Intubation (care and management of intubation patient)** | • Revised pancuronium dose of 4 – 8 mg to accommodate smaller adults and patients aged 12 – 15 years |
| **A0303** | **Failed Intubation Drill** | • Renamed CPG to Difficult airway guideline (DAG)<br>• Team approach and communication emphasised<br>• Revised indications for DAG |
| **A0401** | **Acute Coronary Syndromes** | • Clarification of patients who are indicated for a reduced dose of sublingual GTN (300 mcg)<br>• Ten minute target for 12 – lead ECG<br>• Special notes to ensure patients receive a target dose of 300 mg of aspirin |

# Further Information

## Summary of approved changes

| CPG | CPG title | Amendment summary |
|---|---|---|
| A0402 | Bradycardia | • Atropine dose to 600 mcg, then 1200 mcg (3000 mcg max dose)<br>• Revised maximum adrenaline infusion rate to 10 mcg/min<br>• Introduction of transcutaneous pacing for patients unresponsive to atropine / adrenaline<br>• Standardised combination of fentanyl and midazolam for sedation to facilitate pacing |
| A0403 | Supraventricular Tachyarrhythmias | • Renamed CPG to Tachycardia (Narrow Complex)<br>• Patients with SVT treated with the modified Valsalva manoeuver<br>• Standardised combination of fentanyl and midazolam for sedation to facilitate synchronised cardioversion |
| A0404 | Ventricular Tachycardia (VT) | • Renamed CPG to Tachycardia (Broad Complex)<br>• Introduction of amiodarone administration for patients with VT unresponsive to cardioversion<br>• Standardised combination of fentanyl and midazolam for sedation to facilitate synchronised cardioversion |
| A0405 | Accelerated Idioventricular Rhythm (AIVR) | • CPG retired |
| A0406 | Pulmonary Oedema | • Change name from frusemide to furosemide<br>• Change in furosemide administration to “consider” rather than “required” in patients with suspected acute pulmonary oedema |
| A0407 | Inadequate Perfusion (Cardiogenic causes) | • Revised target SBP of 100 mmHg<br>• Maximum adrenaline infusion rate of 250 mcg/min |
| A0408 | STEMI Management | • Enoxaparin (D034) removed<br>• Introduction of Heparin (D038)<br>• Extension of pre–hospital thrombolysis to rural ALS paramedics, including implementation of an on–call Cardiologist service<br>• Clarification of timeframes for PHT |
| A0502 | Headache | • Frailty dose of paracetamol and age limit ( ≥ 21 years ) for prochlorperazine introduced consistent with CPG A0501 Pain relief to accommodate frail patients and those aged 12 – 15 years<br>• Duplicated IV/IN fentanyl removed and replaced with a reference to CPG A0501 Pain relief |
| A0601 | Asthma | • Nebulised salbutamol dose reduced to 5 mg in mild to moderate asthmatics and moved to special notes<br>• pMDI emphasised |

# Further Information

## Summary of approved changes

| CPG | CPG title | Amendment summary |
|---|---|---|
| **A0701** | **Nausea and Vomiting** | • Introduction of ondansetron IV<br>• Introduction of ondansetron IM special note |
| **A0704** | **Anaphylaxis** | • Stop box and refusal of transport information clarified to emphasise the importance of transporting any patient that may have experienced anaphylaxis<br>• Dexamethasone removed<br>• Introduction of instructions regarding walking or standing the patient<br>• Removal of ETT adrenaline |
| **A0706** | **Meningococcal Septicaemia** | • Additional special notes to align with paediatric section |
| **A0707** | **Overdose** | • Revised indications for sodium bicarbonate in TCA OD<br>• Introduction of titrated dose of IV naloxone for OD on opioids other than heroin |
| **A0708** | **The Agitated Patient** | • Introduction of Ketamine for ALS scope of practice |
| **A0805** | **Burns** | • Addition modified parkland formula to accommodate patients aged 12 – 15 |
| **A0808** | **Elderly falls** | • Introduction of new CPG with recommendations regarding the mx of the falls patient |
| **Further Information** | | • New content regarding family violence<br>• New content regarding miscarriage |
| **P0101** | **Paediatric Assessment** | • Additional special note "any deviation from normal vital signs values is a source of concern and the patient must be transported to hospital"<br>• Definition of paediatric patient as patients < 12 years<br>• Removal of the large child category throughout this section to accommodate the assessment and treatment of patients 12 – 15 years under adult guidelines |
| **P0201** | **Paediatric Cardiac Arrest** | • Change in age threshold that defines paediatric cardiac arrest to < 12 years<br>• Ventilation first approach<br>• Upper limit for rate of external cardiac compressions<br>• Reduction in the time frame for IV attempts prior to IO access<br>• Introduction of a traumatic cardiac arrest CPG<br>• Change adrenaline administration to 1 mg every four (4) minutes<br>• Sodium Bicarbonate administration limited to hyperkalaemia and tricyclic overdose associated arrests<br>• Change to medication / cardioversion requirements in the hypothermic patient<br>• Recommend BSL testing<br>• ETT adrenaline removed |
| **P0202** | **Paediatric Cardiac Arrest (ROSC Management)** | • Introduction of normal saline in combination with adrenaline infusion for circulatory support<br>• $ETCO_2$ target range changed to 30 – 40 mmHg |

# Further Information

| Summary of approved changes | | |
|---|---|---|
| **O0101** | **Obstetric emergencies** | • Renamed "Maternity emergencies" throughout section<br>• Addition of guidance regarding paramedic involvement in home births where there is a midwife on scene |
| **O0301** | **Normal birth** | • Removal of routine cutting of umbilical cord unless there is a clinical or logistical requirement |
| **O0401** | **Primary postpartum haemorrhage (PPH)** | • Fundal massage not advised prior to delivery of placenta<br>• Consult with receiving maternity service for oxytocin and/or misoprostol administration for secondary PPH |
| **N0101**<br>**N0201** | **The newborn baby**<br>**Newborn resuscitation** | • Introduction of guidance regarding viability of the foetus (< 23 weeks, nonviable)<br>• Introduction of 240 mL bag and removal of size 00 OPA<br>• Streamlined algorithm with increased focus on airway and ventilation<br>• Targeted oxygen therapy based on SpO2<br>• ETT adrenaline removed |
| **N0202** | **Newborn advanced resuscitation** | • CPG retired as this information is now included in N0201 |