# 

|  |
| --- |
| Non-emergency patient transport clinical practice protocols |
| 2023 edition |
|  |

|  |
| --- |
| Non-emergency patient transport clinical practice protocols  2023 edition  Date of issue: 19 May 2023  Next revision due: 31 May 2023 |
|  |

|  |
| --- |
|  |
| To receive this document in another format [email the Non-Emergency Patient Transport and First Aid Services team](mailto:NEPTFirstAidRegulation@health.vic.gov.au) <NEPTFirstAidRegulation@health.vic.gov.au>.  Authorised and published by the Victorian Government, 1 Treasury Place, Melbourne.  © State of Victoria, Australia, Department of Health, May 2023.  ISBN/ISSN 978-1-76131-151-2 (online/PDF/Word)  Available at the [NEPT legislation and Clinical Practice Protocols webpage](https://www.health.vic.gov.au/patient-care/nept-legislation-and-clinical-practice-protocols) <https://www.health.vic.gov.au/patient-care/nept-legislation-and-clinical-practice-protocols> |
|  |

Contents

[1](#_Toc135054697)

[Purpose 8](#_Toc135054698)

[2023 edition – review overview 8](#_Toc135054699)

[Guide to using the CPPs 9](#_Toc135054700)

[‘Memory items’ and ‘checklist items’ 9](#_Toc135054701)

[Paediatric and maternity/obstetric patients 9](#_Toc135054702)

[Inter-facility transport (IFT) management – including high-acuity services 10](#_Toc135054703)

[Limitation of treatment and patient review 10](#_Toc135054704)

[Scope of practice 11](#_Toc135054705)

[Assessment tools 15](#_Toc135054706)

[NEPT perfusion status assessment (PSA) – adult 15](#_Toc135054707)

[NEPT respiratory status assessment (RSA) – adult 15](#_Toc135054708)

[Not suitable for NEPT and escalation of care 18](#_Toc135054709)

[Pain assessment tools 20](#_Toc135054710)

[Paediatric assessment triangle 21](#_Toc135054711)

[Acceptable paediatric VSS 22](#_Toc135054712)

[Paediatric definitions and weight guide 22](#_Toc135054713)

[Glasgow coma scale (adult) 24](#_Toc135054714)

[Glasgow coma scale (paediatric) 24](#_Toc135054715)

[AVPU scale 25](#_Toc135054716)

[Time critical guidelines 26](#_Toc135054717)

[Sedation assessment tool (SAT score) 28](#_Toc135054718)

[Mental status assessment (MSA) 29](#_Toc135054719)

[CPP001: Clinical approach to assessment – unplanned medical presentation 31](#_Toc135054720)

[CPP002: Clinical approach to assessment – unplanned major trauma presentation 33](#_Toc135054721)

[CPP003: Clinical approach to inter-facility transport 34](#_Toc135054722)

[CPP004: Cardiac arrest – adult 36](#_Toc135054723)

[Signs of life 36](#_Toc135054724)

[High-quality CPR principles 36](#_Toc135054725)

[Compression ratio: 36](#_Toc135054726)

[Defibrillation pad placement 36](#_Toc135054727)

[General notes 36](#_Toc135054728)

[CPP005: Cardiac arrest – paediatric 39](#_Toc135054729)

[Signs of life 39](#_Toc135054730)

[High-quality CPR principles 39](#_Toc135054731)

[Compression ratio, rate and technique 39](#_Toc135054732)

[Defibrillation pad placement 39](#_Toc135054733)

[General notes 40](#_Toc135054734)

[Hypothermic cardiac arrest < 30°C 40](#_Toc135054735)

[CPP006: Clinical escalation 41](#_Toc135054736)

[CPP007: Oxygen therapy 42](#_Toc135054737)

[CPP008: Narrow complex tachycardia (NCT) 44](#_Toc135054738)

[CPP009: Wide complex tachycardia (WCT) 46](#_Toc135054739)

[CPP010: Bradycardia 48](#_Toc135054740)

[CPP011: Sepsis recognition and escalation 50](#_Toc135054741)

[CPP012: Undifferentiated shock 52](#_Toc135054742)

[CPP013: Cardiogenic shock 55](#_Toc135054743)

[CPP014: Acute cardiogenic pulmonary oedema (ACPO) 57](#_Toc135054744)

[CPP015: Stroke 59](#_Toc135054745)

[CPP016: Headache 61](#_Toc135054746)

[CPP017: Seizures 62](#_Toc135054747)

[CPP018: Asthma – adult 64](#_Toc135054748)

[Thunderstorm asthma 66](#_Toc135054749)

[CPP019: Asthma – paediatric 67](#_Toc135054750)

[CPP020: Chronic obstructive pulmonary disease (COPD) exacerbation 69](#_Toc135054751)

[CPP021: Anaphylaxis: adult 71](#_Toc135054752)

[Recognition of anaphylaxis (RASH criteria) 71](#_Toc135054753)

[CPP022: Anaphylaxis – paediatric 73](#_Toc135054754)

[CPP023: Acute coronary syndrome – cardiac chest pain 75](#_Toc135054755)

[CPP024: Hypoglycaemia 77](#_Toc135054756)

[CPP025: Hyperglycaemia 79](#_Toc135054757)

[CPP026: Nausea and vomiting 80](#_Toc135054758)

[CPP027: Foreign body airway obstruction (FBAO) 81](#_Toc135054759)

[CPP028: Laryngectomy and tracheostomy care 83](#_Toc135054760)

[CPP029: Pain relief 85](#_Toc135054761)

[Pain assessment 85](#_Toc135054762)

[Non-pharmacological management 85](#_Toc135054763)

[Chronic pain 85](#_Toc135054764)

[General notes 85](#_Toc135054765)

[CPP030: Burns 87](#_Toc135054766)

[CPP031: Fractures or dislocations 89](#_Toc135054767)

[CPP032: Traumatic head injury 90](#_Toc135054768)

[CPP033: Potential spinal injury 91](#_Toc135054769)

[Appendix 1: Abbreviations and definitions 93](#_Toc135054770)

[Appendix 2: Withholding or ceasing resuscitation 95](#_Toc135054771)

[Withholding resuscitation 95](#_Toc135054772)

[Ceasing resuscitation 95](#_Toc135054773)

[Appendix 3: Advance care directives and end-of-life care 96](#_Toc135054774)

[Advance care directive (ACD) 96](#_Toc135054775)

[Appendix 4: Mental health patients 99](#_Toc135054776)

[Key message 99](#_Toc135054777)

[Appendix 5: ‘Double-loading’ (low acuity only) 101](#_Toc135054778)

[Appendix 6: Minimum equipment list 102](#_Toc135054779)

[Appendix 7: Prolonged transport 104](#_Toc135054780)

[Pressure injuries 104](#_Toc135054781)

[Appendix 8: Medication pharmacology reference material 105](#_Toc135054782)

[Adrenaline 106](#_Toc135054783)

[Amiodarone 108](#_Toc135054784)

[Aspirin 109](#_Toc135054785)

[Atropine 110](#_Toc135054786)

[Glucagon 111](#_Toc135054787)

[Glucose paste 112](#_Toc135054788)

[Glyceryl Trinitrate (GTN) 113](#_Toc135054789)

[Nitrous Oxide (Entonox®) 115](#_Toc135054790)

[Ipratropium Bromide 116](#_Toc135054791)

[Methoxyflurane 118](#_Toc135054792)

[Metaraminol 120](#_Toc135054793)

[Ondansetron 121](#_Toc135054794)

[Paracetamol 122](#_Toc135054795)

[Salbutamol 123](#_Toc135054796)

# Purpose

The purpose of the Non-emergency patient transport clinical practice protocols (the CPPs)is to provide practice requirements, treatment recommendations and minimum equipment levels to licensed non-emergency patient transport (NEPT) providers when assessing, managing and transporting patients.

In accordance with the *Non-Emergency Patient Transport and First Aid Services Act 2003* (the Act) and the Non-Emergency Patient Transport Regulations 2016 (the Regulations), the CPPs set out additional practices that NEPT providers must follow. These additional requirements assist licensed NEPT providers, health services and other organisations to make decisions about the use of NEPT services for patients with a variety of clinical conditions and in a range of acuities.

The NEPT CPPs do not dictate management for every condition or diagnosis (with some exceptions such as anaphylaxis) that NEPT is likely to provide transport services for, rather the CPPs provide direction for management of symptoms that may present as complications during service delivery.

## 2023 edition – review overview

The 2023 edition of the NEPT CPPs has been developed within the scope and terms of reference of the Clinical Practice Protocol Assessment Committee (CPPAC) from the Department of Health. Consultation has been sought from a wide range of sources including NEPT providers, workforce, the Office of the Clinical Chiefs (Safer Care Victoria), Ambulance Victoria and industrial relations bodies. Subject matter expertise (SME) advice has been sought where required for specific protocols. Clinical scope of practice has been aligned and clarified for different levels of NEPT crew members (PTO, ATA, EN, RN, CCRN) and licence holders should consider these different levels when considering service delivery requirements. Effort has been made to ensure that treatment recommendations contained within the CPPs are best practice for NEPT service delivery at time of publication.

This review sought to:

* ensure best-practice treatment pathways are recommended
* develop new protocols to assist NEPT workforce to manage conditions and situations reasonably expected to be encountered during NEPT service delivery
* clarify and prescribe minimum equipment standards required
* where appropriate, update the scope of practice for NEPT workforce to align with current training
* update to reflect legislative changes

This review did not seek to:

* substantially alter the characteristics of NEPT service delivery
* provide new workforce options for the NEPT sector
* substantially alter scope of service for NEPT workforce.

Where medicines are included with doses it is because they have received [secretarial approval](https://www.health.vic.gov.au/drugs-and-poisons/medicines-and-poisons-secretary-approvals) <https://www.health.vic.gov.au/drugs-and-poisons/medicines-and-poisons-secretary-approvals> for independent possession and administration by NEPT providers or are likely to be approved for purchase and possession under a revised secretarial approval. Please consider medicines available for purchase, possession and administration by a NEPT service when planning management. Refer to minimum equipment list on page 102 for details on suggested medication stockholding levels.

## Guide to using the CPPs

Where treatment recommendations are provided within a protocol, it includes all levels of NEPT crew members and clinical scope of practice. NEPT licence holders have a responsibility to ensure processes are in place to support NEPT crew members to familiarise themselves with and not exceed their credentialled and defined scope of practice, detailed on page 13, when delivering patient care. For any condition described in the CPPs, the NEPT crew members must consider their scope prior to initiating the recommended treatment. This is a departure from previously formatted iterations of the CPPs, which contained different coloured boxes used to indicate different levels of NEPT crew member.

Where a skill, procedure or medicine is accredited for use by a NEPT crew member, this refers to independent initiation. This does not prevent a NEPT crew member undertaking a procedure, skill or administering a medication which they may reasonably be expected to be proficient to perform under the direct supervision and/or authorisation of an appropriately credentialled, registered health practitioner.

NEPT crew members are reminded of the responsibility and availability of seeking clinical consult in case of a need to operate outside credentialled scope of practice including consultation with the Ambulance Victoria (AV) Clinician, NEPT provider clinician, and any applicable registered health practitioner involved in a patient’s care at either a sending or receiving facility.

It is acknowledged that the information provided in the protocols has been selected for the relevance to licensed NEPT providers and may not be suitable for use in other clinical situations. References to management options and medications including use, contraindications, side effects and dose ranges are specific to the types of conditions seen by licensed NEPT providers and may differ from other reference material available. Where applicable management and pharmacology have been aligned to AV’s clinical practice guidelines (CPGs) where any variance would cause confusion or a delay in escalation or transition in care.

## ‘Memory items’ and ‘checklist items’

NEPT crew members rarely action the majority of the CPPs. Therefore, there is **no expectation** that the NEPT CPPs should be committed to memory verbatim. NEPT crew members should consider the items that are required to be ‘memory actions’ requiring immediate attention to preserve life and refer to the CPPs for guidance on specific management options.

Memory items – are designed to give a trained response to certain situations. This will be from training received through foundational formal pre-employment education.

Checklist items – are tasks that should be completed once memory items are completed and will be the continuation of management. The CPPs should be referred to when completing these items.

**Example:** A patient is apnoeic -

* Memory item is to follow the primary survey and provide IPPV.
* Checklist items are the continuation in the applicable CPP, including check of tidal volume and ventilation rates as appropriate and trouble-shooting the cause of apnoea.

## Paediatric and maternity/obstetric patients

The majority of patients treated and transported by NEPT services are adult patients. Paediatric or maternity patient being transported are likely to be clinically well for the duration of a transport. As such, doses for medicines have been included within generic management of some conditions (for example, anaphylaxis) where it is possible that NEPT services will encounter paediatric patients and where intervention is likely and/or required to preserve life.

For further information beyond the material in the CPP on how to manage paediatric or maternity patients in an emergency (including childbirth), contact the Paediatric Infant Perinatal Emergency Retrieval (PIPER) service on 1300 137 650.

## Inter-facility transport (IFT) management – including high-acuity services

Not every condition or deterioration management option will be presented in the CPPs. Where applicable, any management initiated by a sending facility in the case of IFT should be adhered to and a plan developed prior to departure in case of deterioration. These plans may conflict with the CPPs. Where there is conflict, the sending facility / agreed medical plan takes precedence over the CPPs where it is reasonable and in the best interest of the patient. If NEPT crew members are uncertain about the management plan initiated by a sending facility, contact the provider or AV clinician. Where there is uncertainty or a final determination cannot be reached, further advice may be obtained by contacting the relevant retrieval service:

* ARV – 1300 368 661
* PIPER – 1300 137 650

## Limitation of treatment and patient review

NEPT providers should conduct patient care reviews as detailed within the regulations utilising the structure of the clinical oversight committee. Following an adverse outcome or significant presentation requiring management under these CPPs this should be conducted within the ‘just-culture’ framework. Further information on conducting patient reviews can be found through [Safer Care Victoria (SCV)](https://www.safercare.vic.gov.au/support-and-training/review-and-response) <https://www.safercare.vic.gov.au/support-and-training/review-and-response>

The department does not imply any responsibility on the part of NEPT crew members to undertake any treatment or management option that they have not been authorised for or are unable to reasonably perform due to circumstances out of control of the individual crew member.

# Scope of practice

Table 1. Scope of practice for NEPT crew members

| Protocol or skill | PTO | EN | ATA | RN | RN CC |
| --- | --- | --- | --- | --- | --- |
| Cardiac arrest | | | | | |
| defibrillation - AED | ü | ü | ü | ü | ü |
| defibrillation - Manual |  | TE | TE | TE | ü |
| Oropharyngeal airway | ü | ü | ü | ü | ü |
| Nasopharyngeal airway |  | TE | ü | ü | ü |
| Supra-Glottic airway |  | TE | ü | TE | ü |
| Bag Valve Mask Ventilation | ü | ü | ü | ü | ü |
| IV cannulation |  |  |  | TE | ü |
| Adrenaline (IV) |  |  |  |  | ü |
| Amiodarone (IV) |  |  |  |  | ü |
| **Narrow complex tachycardias** | | | | | |
| Assist patient to perform Valsalva if part of own regular management |  |  |  | TE | ü |
| **Wide complex tachycardia** | | | | | |
| Amiodarone (IV infusion) |  |  |  |  | TE |
| **Bradycardia** | | | | | |
| Atropine |  |  |  |  | TE |
| **Undifferentiated shock** | | | | | |
| IV fluid (normal Saline) |  |  |  | TE | ü |
| Metaraminol IV |  |  |  |  | TE |
| **Cardiogenic shock** | | | | | |
| Supportive care (positioning) | ü | ü | ü | ü | ü |
| Adrenaline infusion |  |  |  |  | TE |
| **Anaphylaxis (adult and paediatric)** | | | | | |
| Adrenaline (via auto injector) (IM) | ü | ü | ü | ü | ü |
| Adrenaline 1:1000 drawn from ampoule (IM) |  | TE | TE | ü | ü |
| Normal Saline bolus doses |  |  |  | TE | ü |
| Glucagon for refractory anaphylaxis |  | ü | TE | ü | ü |
| Adrenaline via Neb for stridor |  | TE | ü | ü | ü |
| Salbutamol (pMDI) | ü | ü | ü | ü | ü |
| Salbutamol (Neb) |  | TE | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (pMDI) |  | ü | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (Neb) |  | TE | ü | ü | ü |
| Adrenaline IV bolus |  |  |  |  | ü |
| **Breathing difficulties (hypoxia management)** | | | | | |
| Oxygen saturation monitoring | ü | ü | ü | ü | ü |
| Oxygen (nasal prongs/face mask) | ü | ü | ü | ü | ü |
| Titrated oxygen care based on oxygen saturation | ü | ü | ü | ü | ü |
| Bag Valve Mask Ventilation | ü | ü | ü | ü | ü |
| **Asthma (adult and paediatric)** | | | | | |
| Salbutamol (pMDI) | ü | ü | ü | ü | ü |
| Salbutamol (Neb) |  | TE | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (pMDI) |  | ü | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (Neb) |  | TE | ü | ü | ü |
| Adrenaline (1:1000) IMI |  | TE | ü | ü | ü |
| Adrenaline (auto-injector) | ü | ü | ü | ü | ü |
| **COPD exacerbation** | | | | | |
| Salbutamol (pMDI) | ü | ü | ü | ü | ü |
| Salbutamol (Neb) |  | TE | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (pMDI) |  | ü | ü | ü | ü |
| Ipratropium Bromide (Atrovent) (Neb) |  | TE | ü | ü | ü |
| **Laryngectomy/tracheostomy care** | | | | | |
| Transport of non-recent insertion (no complications forecast) | ü | ü | ü | ü | ü |
| Transport of recent (>5 days) insertion |  |  |  |  | ü |
| Suction/oxygenation | ü | ü | ü | ü | ü |
| **Acute cardiogenic pulmonary oedema** | | | | | |
| Glyceryl Trinitrate (S/L) |  | ü | ü | ü | ü |
| Oxygen therapy | ü | ü | ü | ü | ü |
| **Choking** | | | | | |
| Back blows/chest thrusts | ü | ü | ü | ü | ü |
| Laryngoscopy/Magills forceps |  |  |  |  | TE |
| **Acute coronary syndrome** | | | | | |
| 3 lead ECG monitoring |  | ü | ü | ü | ü |
| 12 Lead ECG acquisition (not diagnostic) |  | ü | ü | ü | ü |
| Aspirin (oral) | ü | ü | ü | ü | ü |
| GTN (sublingual) |  | ü | ü | ü | ü |
| **Hypoglycaemia** | | | | | |
| Glucose paste (oral) | ü | ü | ü | ü | ü |
| BGL | ü | ü | ü | ü | ü |
| Glucagon (IM) |  | TE | ü | ü | ü |
| Dextrose 10% |  |  |  |  | ü |
| **Nausea and vomiting** | | | | | |
| Ondansetron (oral) |  | ü | ü | ü | ü |
| Ondansetron IV/IM |  |  |  | ü | ü |
| **Fracture management** | | | | | |
| Anatomical splinting | ü | ü | ü | ü | ü |
| Traction splints | TE | TE | ü | TE | ü |
| Pelvic splinting | ü | ü | ü | ü | ü |
| **Pain management** | | | | | |
| Ice/warm pack | ü | ü | ü | ü | ü |
| Formable splint | ü | ü | ü | ü | ü |
| Anatomical splint | ü | ü | ü | ü | ü |
| Paracetamol (oral) | ü | ü | ü | ü | ü |
| Methoxyflurane (inhaled) |  | ü | ü | ü | ü |
| Entonox (inhaled) |  | ü | ü | ü | ü |
| **Spinal injuries** | | | | | |
| C-collar | ü | ü | ü | ü | ü |
| Prophylactic ondansetron |  | TE | ü | ü | ü |
| **Major trauma management** | | | | | |
| Arterial tourniquets | ü | ü | ü | ü | ü |
| Pressure dressings | ü | ü | ü | ü | ü |
| **Maintenance of medication administration** | | | | | |
| Narcotic infusion (s/c) |  | TE | ü | ü | ü |
| IV Crystalloid |  | TE | ü | ü | ü |
| GTN infusion |  | TE | ü | ü | ü |
| Heparin infusion |  | TE | ü | ü | ü |
| Blood products |  | TE | ü | ü | ü |
| IV Crystalloid with potassium added |  | TE | ü | ü | ü |
| Antibiotic infusion maintenance |  | TE | ü | ü | ü |
| Narcotic infusion (IV) |  |  |  | ü | ü |
| Other vasoactive medications (e.g. inotropes) |  |  |  |  | ü |
| Anti-arrhythmic medications |  |  |  |  | ü |
| **Other treatments** | | | | | |
| Capped CVC for low acuity patients | ü | ü | ü | ü | ü |
| PICC that is not in active use | ü | ü | ü | ü | ü |
| TPN via PICC |  | TE | ü | ü | ü |
| Bladder washout |  | TE |  | ü | ü |
| Chemotherapy infusion |  | TE | TE | TE | TE |
| CVC infusion (including TPN) |  |  |  | ü | ü |
| ICC |  |  |  | TE | ü |
| Insulin infusion |  |  |  | ü | ü |
| IV cannula insertion |  |  |  | TE | ü |
| Arterial line monitoring (not insertion) |  |  |  |  | ü |
| Intra-aortic balloon pump management |  |  |  |  | ü |
| Pacing wire management (not insertion) |  |  |  |  | ü |
| **Transport Acuity** | | | | | |
| Low acuity (IFT) | ü | ü | ü | ü | ü |
| Low acuity (unplanned ambulance) | ü | ü | ü | ü | ü |
| Medium acuity (IFT) |  | ü | ü | ü | ü |
| Medium acuity (unplanned ambulance) |  | TE | ü | TE | ü |
| High acuity (IFT only) |  |  |  |  | ü |

# Assessment tools

## NEPT perfusion status assessment (PSA) – adult

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

It is important to not view perfusion as an isolated vital sign (for example BP), rather the picture the patient presents as a collection of vital signs. It is important to contextualise perfusion with the patients presenting condition and any significant past medical history.

Table 2. NEPT PSA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Skin | Pulse | BP | Conscious state | Capillary refill |
| **Adequate perfusion** | Warm, pink, dry | 60-100 BPM | > 100 systolic | Alert | Central and distal  < 2 seconds |
| **Borderline perfusion** | Warm, pink, dry/cool, pale, clammy | 50-100 BPM | 80-100 systolic | Alert | Central < 2 seconds  Distal > 2 seconds |
| **Inadequate perfusion** | Cool, pale, clammy | < 50 BPM  or > 100 BPM | 60-80 systolic | Alert or altered | Central < 2 seconds or > 2 seconds  Distal > 2 seconds |
| **Extremely poor perfusion** | Cool, pale, clammy | < 50 BPM  or > 110 BPM | < 60 systolic or unrecordable | Altered or unconscious | Central > 2 seconds  Distal > 2 seconds |
| **No perfusion** | Cyanotic, cool, pale, clammy | No palpable pulse | Unrecordable | Unrecordable | Extremely delayed central and distal refill or none |

## NEPT respiratory status assessment (RSA) – adult

Respiratory status refers to the movement of air in and out of the lungs (ventilation – V) and the exchange of carbon dioxide (CO2) and oxygen (O2) at the alveolar level (perfusion – Q).

This means that respiratory effort measures two important components – the physical effort of moving air in and out of the lungs and the effectiveness of gas exchange within the lungs. It is important to consider these two components when assessing respiratory status as some conditions which require oxygen or ventilation support may not have any adventitious sounds on auscultation – for example, pulmonary embolus or cystic fibrosis.

No single sign or symptom constitutes the respiratory status of a patient. Signs and symptoms referred to in table 3 should be considered when they directly correlate to a patient’s respiratory function, for example somebody who is mildly anxious in isolation with no respiratory component does not automatically have mild respiratory distress. Likewise, a patient who is obviously fighting to breathe but does not have an easily measured respiratory rate may be critical.

Some general and accepted respiratory values and markers correlating to an assessment of the respiratory status of a patient are summarised in table 3. Table 3 relates only to an otherwise well person and should be assessed against the normal respiratory status of the patient. For example, a patient with Chronic Obstructive Pulmonary Disease (COPD) may present with scattered wheezing as their ‘normal’ respiratory status however persistent wheeze could indicate a deterioration or acute presentation of their condition.

Table 3. NEPT RSA

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | No respiratory distress | Mild distress | Moderate distress | Severe distress | Critical |
| General appearance | Calm or quiet | Mildly anxious | Distressed or anxious | Distressed, anxious | Fighting to breathe, catatonic |
| Speech | Clear and steady sentences | Full sentences | Short phrases | Words only | Unable to speak or single word or grunting |
| Breath sounds and auscultation | *Bronchospasm:* Usually quiet with no wheeze  *Oedema:* No crackles or scattered fine crackles | Able to cough  *Bronchospasm:* Mild expiratory wheeze  *Oedema:* crackles at base of lungs | Able to cough  *Bronchospasm:* expiratory wheeze +/- inspiratory wheeze  *Oedema:* crackles at base to mid-zone | Unable to cough  *Bronchospasm:* expiratory and inspiratory wheeze  *Oedema:* crackles full-field +/- possible wheeze | Unable to cough  *Bronchospasm:* Little to not air movement – ‘silent chest’.  *Oedema:* Full field crackles +/- possible wheeze OR little to no air movement |
| Respiratory rate | 12-16 | 16-20 | > 20 | > 20 | > 30 or < 8 |
| Respiratory rhythm | Regular even cycles | Slight increase in normal chest movement | *Bronchospasm:* prolonged expiratory phase  *Oedema:* short sharp breaths | *Bronchospasm:* Prolonged expiratory phase  *Oedema:*short sharp breaths | *Bronchospasm:* Prolonged expiratory phase  *Oedema:*short sharp breaths |
| Work of breathing | Normal chest movement | Slight increase in normal effort | Marked chest movement +/- use of accessory muscles | Marked chest movement with accessory muscle use, intercostal retraction +/- tracheal tugging | Marked chest movement with accessory muscle use, intercostal retraction +/- tracheal tugging  Or  Reduced respiratory effort due to fatigue |
| Heart Rate | 60-100 | 60-100 | 100-120 | > 120 | > 120 or bradycardic (late stage) |
| Skin | Normal | Normal | Pale and sweaty | Pale and sweaty +/- cyanosis | Pale and sweaty, peripheral cyanosis may be central cyanosis (late sign) |
| Conscious state | Alert | Alert | May be altered | Altered | Altered or catatonic (no purposeful movements or interaction) |

## Not suitable for NEPT and escalation of care

It is a requirement of the regulations that NEPT providers do not transport a patient if their condition is time critical or is likely to become time critical during transport. Table 4 summarises vital signs survey (VSS) that may indicate a person is not suitable for NEPT. When considering the physiological parameters in table 4 they should be contextualised against the patient’s normal physiological state and likelihood of deterioration and expected clinical trajectory. For example:

* A small frame patient may have a ‘normal’ BP of 90/50, where the NEPT crew member can be reasonably satisfied that no other aspect of perfusion is compromised and this is normal for the patient.
* A patient who has just completed a dialysis appointment may present with mild hypotension and this has been considered by the health practitioner administering dialysis.

NEPT transport may then be authorised following clinical advice or assessment by a person authorised to assess the patient as being haemodynamically stable for transport. Specifically, person’s authorised to assess the patient must be either a registered medical practitioner, registered nurse or registered paramedic.

During IFT the patient must meet the requirements outlined in table 4and have a plan and medicines provided prior to transport to allow to manage reasonably predictable deterioration (for example, order and supply of vasopressors). Consideration should be given to optimising patient presentation and VSS at the sending facility prior to commencing transport and contact with ARV established.

NEPT crew members should be aware that they may be directed to transport a patient outside of these parameters by a medical practitioner, registered nurse or registered paramedic working within the AV communications centre when it is necessary to avoid the possibility of a patient dying or suffering an adverse event were the patient required to wait for alternative transport.

Table 4. Not suitable for NEPT

|  |  |  |  |
| --- | --- | --- | --- |
| NEPT transport criteria | Acuity | | |
| Low | Medium | High |
| Heart rate | < 60  >100 | < 50 (with no other signs of altered perfusion)  > 110 | < 45 (with no other signs of altered perfusion)  > 120 |
| Systolic blood pressure | < 100 | < 100 | < 90  Or  MAP < 60 |
| GCS | Any reduction to normal GCS | Reduction in GCS > 2 points from patient’s normal baseline conscious state | Reduction in GCS > 2 points from patient’s normal baseline conscious state (excluding mechanically ventilated patient with escort) |
| Respiratory status | < Normal respiratory status | Mild respiratory distress that does not respond to management  OR  Moderate, severe, critical respiratory distress | Mild respiratory distress that does not respond to management  OR  Moderate, severe, critical respiratory distress (excluding patient well established on NIV with escort) |
| Cardiac Chest pain | Not within 2 hours of transport | Not within 2 hours of transport | Not within 2 hours of transport |
| Major trauma  (as described in major trauma criteria) | Not by NEPT | Not by NEPT | Not by NEPT |
| Acute stroke symptoms | Not by NEPT | Not routinely by NEPT unless outside of stroke treatment window or not for acute management. | Not routinely by NEPT unless outside of stroke treatment window or not for acute management |
| Severe acute abdominal pain (no diagnosis) | Not by NEPT | Not by NEPT | Not by NEPT |
| Pain unable to be controlled by NEPT | Escalate care | Escalate care | Escalate care |
| Clinical agitation | SAT Score >0  SAT score <0 | SAT score > +1  SAT score < -1 | SAT score > +1  SAT score < -1 |
| Burns (acute phase) | Not by NEPT | * Superficial burns not affecting a single local area, or involving a sensitive location * Partial thickness burns * Full thickness burns * Burns meeting major trauma criteria | * Superficial burns not affecting a single local area, involving a sensitive location * Partial thickness burns * Full thickness burns * Burns meeting major trauma criteria   Unless determined by sending facility in consultation with ARV |
| Headache | Headache not normal presentation for patient | Headache not normal  presentation for patient | Headache not normal  presentation for patient |

## Pain assessment tools

### Pain scales

#### Numeric rating scale

The patient is asked to scale a number between 0-10 that best describes the amount of pain experienced with zero being ‘no pain’ and 10 being the ‘worst pain imaginable’.

#### Verbal rating scale

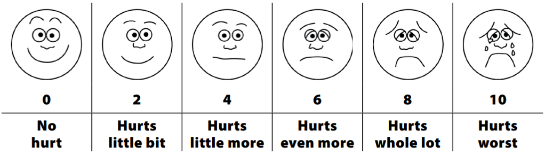
The verbal rating scale asks the patient to choose a phrase that best describes the pain, usually mild, moderate, severe.

#### Wong-Baker FACES pain scale

A visual representation of faces that best describes a pain. The scale is intended to be used to measure how a paediatric patient *feels,* not necessarily how they look.

In the following instructions, the words ‘hurt’ or ‘pain’ can be interchanged. Select whichever seems right for a particular child. Do not use words like ‘happy’ and ‘sad.’

‘These faces show how much something can hurt. This face [point to left-most face] shows no pain. The faces show more and more pain [point to each from left to right] up to this one. [point to right-most face] It shows very much pain. Point to the face that shows how much you hurt [right now].’



### Pain assessment mnemonics

#### O P Q R S T

* Onset, provocation, quality, radiation, severity, time

#### D O L O R

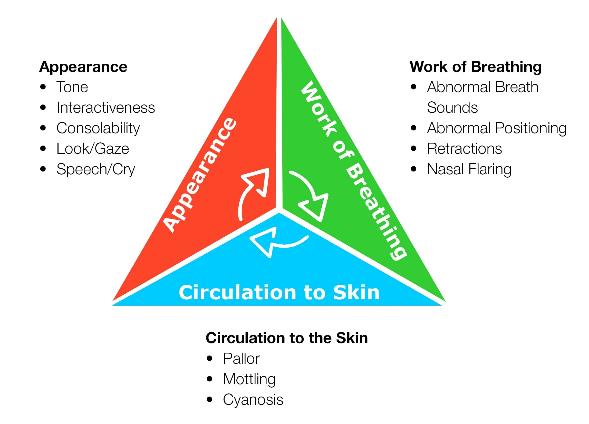
* Description, onset, location, other, radiation

## Paediatric assessment triangle

The paediatric assessment triangle provides a quick visual reference guide to assist NEPT crew members in determining if a paediatric patient is ‘unwell’. Where a paediatric patient is considered ‘unwell’, care must be escalated.

Parent or caregiver concern should also serve as a strong prompt for clinical escalation, even in the absence of other identifiable markers of a child being unwell. NEPT crew members must take the concerns of parents seriously, discuss concerns with a parent and ensure that the parent or caregiver feels able and comfortable to speak up if they are concerned about their child.

Figure 1. Paediatric assessment triangle



## Acceptable paediatric VSS

Table 5 summarises acceptable VSS for children in care. The table should be referred to when assessing paediatric population as a checklist item with no expectation this is to be memorised. Where paediatric patients have VSS outside of these numbers and/or are unwell when scaled against the paediatric assessment triangle, care must be escalated.

Table 5. Acceptable paediatric VSS by age

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Age | Approximate weight (kg) | Systolic BP (mmHg) | Heart rate  (beats per minute) | Respiratory rate  (breaths per minute) |
| Term | 3.5 | 60-95 | 120-185 | 25-60 |
| 3 months | 6 | 60-105 | 115-180 | 25-60 |
| 6 months | 8 | 75-105 | 110-180 | 20-55 |
| 1 year | 10 | 70-105 | 105-180 | 20-45 |
| 2 years | 12 | 70-105 | 95-175 | 20-40 |
| 4 years | 15 | 75-110 | 80-150 | 17-30 |
| 6 years | 20 | 80-115 | 75-140 | 16-30 |
| 8 years | 25 | 80-115 | 70-130 | 16-30 |
| 10 years | 30 | 85-120 | 60-130 | 15-25 |
| 12 years | 40 | 90-120 | 65-120 | 15-25 |
| 14 years | 50 | 90-125 | 60-115 | 14-25 |
| 16 years | 60 | 90-130 | 60-115 | 14-25 |

### Signs of paediatric respiratory distress

Paediatric patients should be assessed using table 5. However, paediatric patients may be unwell in a more subtle way or with respiratory rates which are unable to be reliably measured by visual means alone. The following should be assessed when determining paediatric respiratory distress:

* Tachypnoea (fast breathing rate)
* Chest wall retraction
* Use of accessory muscles
* Tracheal tugging
* Abdominal protrusion.

## Paediatric definitions and weight guide

The paediatric definition and weight guide assists NEPT crew members to determine which management options to follow for conditions where clinical practice varies between age groups and provides an indication for weight-based doses of medicines.

Paediatric patients aged ≥12 years of age should be managed using the applicable adult CPP.

Table 6. Paediatric age/weight definitions

|  |  |  |
| --- | --- | --- |
| Age group | Age definition | Weight guide |
| Newborn | Birth to 24 hours | 3.5 kg |
| Small infant | < 3 months | 6 kg |
| Large infant | 3-12 months | 8-10 kg |
| Small child | 1-4 years | Weight (kg) = [Age] x 2 + 8 |
| Medium child | 5-11 years | Weight (kg) = [Age] x 3.3 |

## Glasgow coma scale (adult)

The Glasgow coma score is used to objectively describe the extent of impaired consciousness in all types of acute medical and trauma patients. Any change in the patient’s GCS score should be noted and care should be escalated as appropriate. GCS should be expressed as a sum of the following scores with a lower number representing a patient with a lower level of consciousness.

**Best eye response (4)**

* No eye opening – 1
* Eye opening to pain – 2
* Eye opening to sound - 3
* Eyes open spontaneously - 4

**Best verbal response (5)**

* No verbal response - 1
* Incomprehensible sounds - 2
* Inappropriate words - 3
* Confused - 4
* Orientated - 5

**Best motor response (6)**

* No motor response - 1
* Abnormal extension to pain - 2
* Abnormal flexion to pain - 3
* Withdrawal from pain – 4
* Localising pain - 5
* Obeys commands – 6

## Glasgow coma scale (paediatric)

The following paediatric GCS should be used to assess children ≤4 years of age. Children > 4 years of age they be assessed against the adult GCS.

**Best eye response (4)**

* No eye opening – 1
* Eye opening to pain – 2
* Eye opening to sound - 3
* Eyes open spontaneously - 4

**Best verbal response (5)**

* No verbal response - 1
* Moans to pain - 2
* Persistently irritable - 3
* Cries but consolable - 4
* Appropriate words/social smile - 5

**Best motor response (6)**

* No motor response - 1
* Abnormal extension to pain - 2
* Abnormal flexion to pain - 3
* Withdrawal from pain – 4
* Localising pain - 5
* Obeys commands – 6

## AVPU scale

AVPU is a straightforward scale used to rapidly assess a patient’s neurological and physiological status by assessing the patient’s level of consciousness, responsiveness and mental status.

* Alert: The patient is aware of the examiner and can respond to the environment around them independently. The patient can also follow commands, open their eyes spontaneously, and track objects.
* Verbally Responsive: The patient's eyes do not open spontaneously. The patient's eyes open only in response to a verbal stimulus directed toward them. The patient can react to that verbal stimulus directly and in a meaningful way.
* Painfully Responsive: The patient's eyes do not open spontaneously. The patient will only respond to the application of painful stimuli by an examiner. The patient may move, moan, or cry out directly in response to the painful stimuli.
* Unresponsive: The patient does not respond spontaneously. The patient does not respond to verbal or painful stimuli.

## Time critical guidelines

The Victorian time critical guidelines are designed to prompt expeditious transport to highest level of trauma service accessible within 60 minutes. NEPT crew members should use this to determine whether a patient is trauma time critical. Where a patient is trauma time critical, the use of NEPT as a routine transport option is not endorsed.

NEPT resources may be used to transport trauma time critical patients at the request of a registered nurse, registered paramedic or medical practitioner working in the AV communications centre to avoid the possibility of a patient suffering an adverse event or dying. Where this occurs, NEPT crew members must receive a destination hospital at the time such an authorisation or request is provided.

### Actual time critical

Vital signs indicating time criticality following potential major trauma

* HR < 60 or > 120
* RR < 10 or > 30
* Systolic BP < 90mmHg
* SPO2 < 90%
* If ≥ 16 years
  + GCS <13
* If ≤15 years
  + GCS <15
* Patient > 65 years old who suffered a fall < 1 m in the metropolitan region with an isolated reduction in GCS

### Potential time critical

Specific injuries that may meet potential major trauma criteria if found in combination with high-risk criteria.

#### 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 years old 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 femur/tibia/humerus
* Fractured pelvis.

Assess the above and if present in combination with the following high-risk criteria, manage as major trauma.

#### Mechanism of injury

* Motor/cyclist impact > 30kph
* High speed MCA
* Pedistrian impact
* Ejection from vehicle
* Prolonged extrication
* Fall from height > 3m
* Struck on head by object falling > 3m
* Explosion

#### Co-morbidities

* Age < 12 or > 55, OR
* Pregnant, OR
* Significant underlying medical condition.

## Sedation assessment tool (SAT score)

Occasions may arise where NEPT services are engaged to transport an agitated patient or a patient suffering from an acute mental health episode. The SAT score should be used as a guide to determine whether transport is able to be facilitated by NEPT services. See Appendix 4: Information about the transport of mental health patients by NEPT services for further information.

Undifferentiated agitation (that is, not linked to a known mental health condition or past history of behaviour) is unlikely to be NEPT suitable and should prompt concern as this may be due to physiological distress, and care should be escalated.

NEPT crew members should conduct a risk assessment prior to transport and escalate concerns if there is a reasonable belief that transport cannot be safely undertaken. The administration of sedation is not authorised for NEPT, however NEPT may transport patients who have received sedation.

Table 7. Sedation assessment tool

|  |  |  |
| --- | --- | --- |
| Score | Responsiveness | Speech |
| +3 | Combative, violent out of control | Continual loud outbursts |
| +2 | Very anxious and agitated | Loud outbursts |
| +1 (medium-high acuity cut-off) | Anxious or restless | Normal or talkative |
| 0 (low-acuity cut-off) | Awake, and calm or cooperative | Speaks normally |
| -1 (medium-high acuity cut-off) | Asleep, but rouses if name is called | Slurring or prominent slowing |
| -2 | Responds to physical stimulation | Few recognisable words |
| -3 | No response to stimulation | Nil |

## Mental status assessment (MSA)

Look for, listen to and ask about all categories below. The patient may be suffering from some of the following

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

### Observe

#### Safety

NEPT crew member, patient and bystander safety first is priority. Assess the scene for dangers, that is, location or weapon. Obtain police support early if required. Maintain vigilant reassessment of scene safety.

#### Appearance

Look for signs of indicative of mental health issues or poor self-caring; uncleanliness, dishevelled, malnourished, signs of addiction (injection marks or nicotine stains), posture, pupil size or 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 (that is, wired or buzzing), bizarre or inappropriate responses to stimuli, or pacing.

#### Affect

Observed to be flat, depressed, agitated, excited, hostile, argumentative, violent, irritable, morose, reactive, unbalanced, bizarre, withdrawn, et cetera.

### Listen

#### Speech

Take note of rate, volume, quantity, tone, content, excessive talking, difficulty engaging, tangential, flat, inflections et cetera.

#### Thought process

May be altered, can be perceived by patient jumping irrationally between thoughts, sounding vague, unsteady through-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 or lack of insight.

### Discuss

#### Thought content

May be dominated by delusions, obsessions, preoccupations, phobias, suicidal/depressed or homicidal thoughts, compulsions or superstitions.

#### Self-harm

Ask patient directly if they have attempted self-harm, suicide or are thinking about or planning these. Ask about previous attempts.

#### Perceptions

Patient may be suffering from hallucinations (ask specifically about auditory, visual and command hallucinations), disassociation, that is, ‘I feel detached from my body’, ‘my surroundings aren’t real’ or ‘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).

# CPP001: Clinical approach to assessment – unplanned medical presentation

Generally, unplanned events will present following calls to the emergency phone line (Triple Zero ‘000’), State health emergency management plan (SHEMP – replaced SHERP) activations, or incidentally when conducting other NEPT duties.

This approach should also be applied by NEPT crew members when conducting an IFT and the patient presents with an unexpected deterioration or with a different complaint or condition than the IFT was originally requested for.

Where NEPT crew members suspect a significant underlying condition or are concerned with patient presentation regardless of patient VSS, refer to CPP006 Clinical escalation. NEPT crew members should be suspicious of signs and symptoms that cannot be explained.

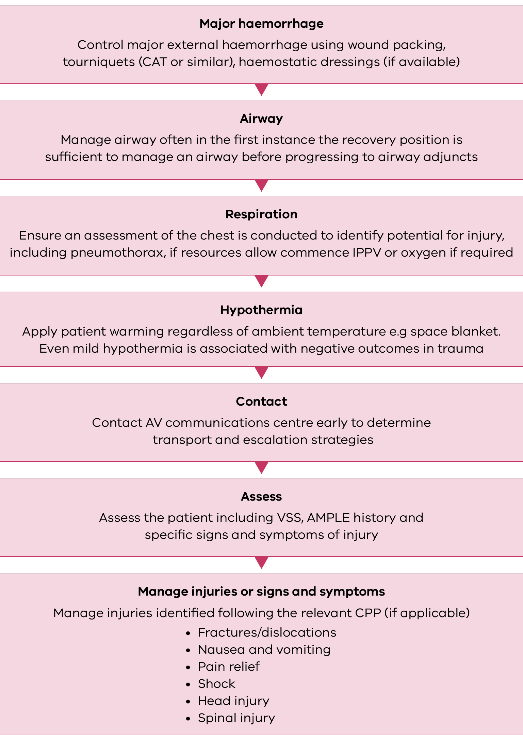
Figure 2. Clinical approach to assessment unplanned medical presentation



# CPP002: Clinical approach to assessment – unplanned major trauma presentation

Trauma presentations should be assessed in the first instance with these considerations before moving on to injury specific assessment and management. The priorities listed below are the priorities in managing immediate life threat in major trauma and are a departure from traditional order of ‘ABC’.

Figure 3. Clinical approach to assessment unplanned major trauma presentation



# CPP003: Clinical approach to inter-facility transport

Inter-facility transport (IFT) is defined as the transport of patients between healthcare facilities. IFT is a crucial part of today's healthcare system that allows facilities to transfer patients needing specialised assessment or care that cannot be adequately provided at their current health facility.

Prior to conducting an IFT, NEPT crew members should ascertain the exact clinical condition of the patient and determine the potential for deterioration prior to commencing transport. Refer to Table 4 ‘not suitable for NEPT’ to determine patient eligibility for transport.

During the IFT, NEPT crew members are required to reassess the patient appropriately, and clearly document any changes in the patient’s condition or any interventions that have been undertaken.

At a minimum, a set of VSS must be obtained within 30 minutes prior to transfer from a sending facility. Additional sets of VSS should be recorded as required and with respect to patient acuity. Patients receiving active management should receive 15-minutely VSS or more frequently as dictated by patient condition.

Minimum observations include:

* GCS
* RSA
* PSA
* SPO2
* Pain assessment (where appropriate)
* BGL (where appropriate)
* Temperature (where appropriate).

The following checklist table may be completed as a memory aid by NEPT crew members prior to transport commencing.

Table 8. Checklist for completion prior to transport

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Yes | No | N/A |
| Handover provided and transfer paperwork provided   * Confirm receiving facility |  |  |  |
| Is the patient time critical or likely to become time critical during transfer?  If yes, transfer is not suitable for NEPT |  |  |  |
| Has the patient experienced cardiac related chest pain in the  2 hours prior to transfer?  If yes,transfer is not suitable for NEPT |  |  |  |
| Has the patient been assessed by a registered paramedic, registered nurse or registered medical practitioner as being haemodynamically stable for the duration of the transfer?   * If no, transfer is not suitable for NEPT   Gain details of authorising health practitioner |  |  |  |
| Advanced care directive provided (where an ACD exists) |  |  |  |
| Plan for clinical management/deterioration agreed upon and ongoing management identified   * Frequency of VSS stipulated * Clinical trajectory * Infusion doses established * Medication and other care required PRN during transfer established * Pressure injury assessment or prevention plan |  |  |  |
| Does patient acuity at time of dispatch match patient acuity at time of transfer?  If no, and patient acuity not within scope of NEPT crew, transfer is not suitable for NEPT |  |  |  |
| Is patient ready for transfer?   * Toileted * Hydrated * Fed * Analgesia provided (if applicable) * Sedation provided (if applicable) |  |  |  |
| Confirm three (3) points of patient identification, for example:   * Medical ID bracelet * Health care record * Patient stating name and identifying features |  |  |  |
| Is all required equipment for transport present, for example (as applicable):   * Cardiac monitoring * NIBP * SPO2 * BGL * ETCO2 * Infusion pump(s) * Arterial line established * IDC in situ |  |  |  |
| Have all medications required for transport been prepared and supplied? |  |  |  |
| Have all medications or prescriptions required for ongoing care been provided and included as part of handover documentation? |  |  |  |
| Have all patient belongings been accounted for and are they able to be transported? |  |  |  |
| Is patient aware of the reasons for transfer and do they consent to the transfer (where appropriate)? |  |  |  |

Table 9. Post transport checklist

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Yes | No | N/A |
| Has verbal handover been provided to receiving facility? |  |  |  |
| Has a patient care record been completed? |  |  |  |
| Has a patient care record been provided to receiving facility (medium-high acuity only)? |  |  |  |
| Have patient belongings, medication and clinical notes been transferred to the receiving facility? |  |  |  |

# CPP004: ­Cardiac arrest – adult

## Signs of life

Any patient who is unconscious and not breathing normally (for example, gasping, agonal breathing) should be presumed to be in cardiac arrest. Palpation of a pulse is unreliable, if any doubt exists as to the presence of a pulse, chest compressions must be commenced.

## High-quality CPR principles

* Rate: 100-120 compressions per minute
* Depth: ≥ 5 cm, allow for full recoil
* Ventilation duration: 1 second per ventilation (aiming to see rise and fall of the chest)
* Two-minute rotations of compressor
* Minimise interruptions to chest compressions (including while pad placement occurs)
* Optimal defibrillation pad positioning
* Resume compressions immediately after defibrillation or disarm/no shock delivered.

## Compression ratio:

### No SGA (OP/NPA/BVM)

* 30 compressions : 2 ventilations
* Pause for ventilations

### SGA or ETT insitu

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

## Defibrillation pad placement

Optimal defibrillation pad positioning ensures transmyocardial current density is maximised when defibrillation occurs.

* Apex pad is positioned on the left, at the mid axillary line, 6th intercostal space
* Sternal pad rolled on laterally from right sternal margin on the patient’s right chest, under the right clavicle and above the right nipple

## General notes

* For the purposes of the protocols, an automatic external defibrillator (AED) is regarded as being the same as a semi‑automatic external defibrillator (SAED).
* High-quality ECC and defibrillation are the cornerstone of resuscitation – this must be prioritised over all other interventions.

### 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 dose.

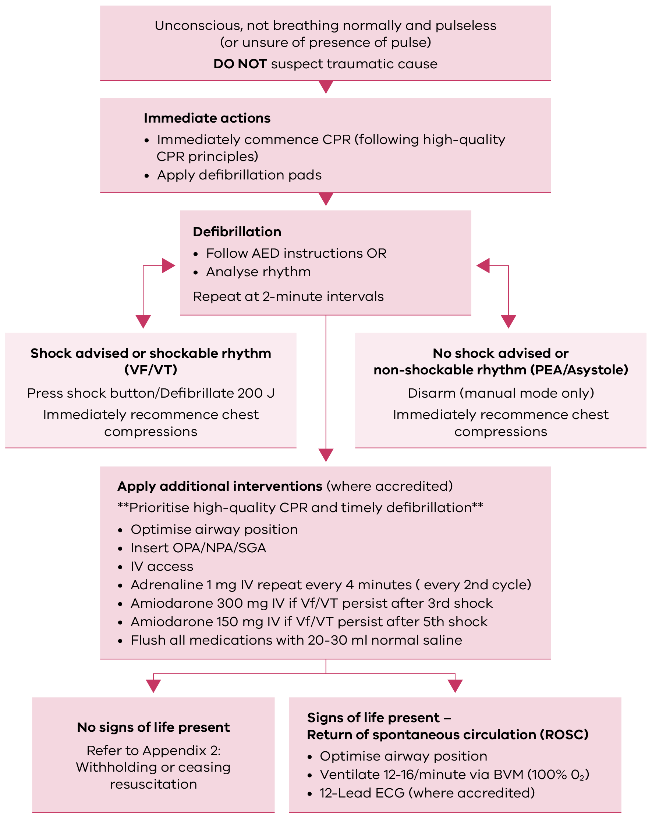
### Traumatic cardiac arrest

Where trauma is the suspected cause of cardiac arrest prioritise control of major haemorrhage over all other interventions. Follow management within CPP002 Clinical approach to assessment - unplanned major trauma presentation.

### Withholding or ceasing resuscitation

Refer to Appendix 2: Withholding or ceasing resuscitation.

Figure 4. Cardiac arrest algorithm



# CPP005: Cardiac arrest – paediatric

This guideline applies to patients <12 years of age. See also: CPP004 Cardiac arrest: adult for patients ≥ 12 years.

Effective airway control and adequate ventilation with oxygen supplementation is the cornerstone of paediatric resuscitation.

## Signs of life

Patients < 12 years of age who are unresponsive, not breathing normally and pulseless;   
or HR < 60 bpm (infants); or HR < 40 bpm (children) are presumed to be in cardiac arrest.

## High-quality CPR principles

* 1/3 chest depth, allow for full recoil
* Ventilation duration: 1 second per ventilation (aiming to see rise and fall of the chest)
* Two-minute rotations of compressor
* Minimise interruptions to chest compressions (including while pad placement occurs)
* Optimal defibrillation pad positioning
* Resume compressions immediately after defibrillation or disarm/no shock delivered

## Compression ratio, rate and technique

|  |  |  |  |
| --- | --- | --- | --- |
| Age | CPR ratio | Compression rate | Technique |
| Newborn (birth up to 24 hours) | 3 compressions : 1 ventilation | 90 compressions per minute with 0.5 second pause for ventilation | 2 finger or 2 thumbs  One third of the depth of chest |
| Infants (1 day up to 1 year) | 30 compressions : 2 ventilations (one rescuer)  15 compressions : 2 ventilations (two rescuers) | 100-120 compressions per minute | 2 finger or 2 thumbs  One third of the depth of chest |
| Small and medium child (1 to 11 years) | 30 compressions : 2 ventilations (one rescuer)  15 compressions : 2 ventilations (two rescuers) | 100-120 compressions per minute | One hand or 2 hands  One third of the depth of chest |

## Defibrillation pad placement

Optimal defibrillation pad positioning ensures transmyocardial current density is maximised when defibrillation occurs.

* Defibrillation pad placement should be as close as possible to adult placement.
* The ‘anterior’ pad is placed on the left side, mid-axillary line (same as adult placement).
* The ‘posterior’ pad is placed on the right upper chest/clavicle (same as adult placement).
* Wrapping over the shoulder is permissible to ensure sufficient gap between the pads. Avoid the neck.

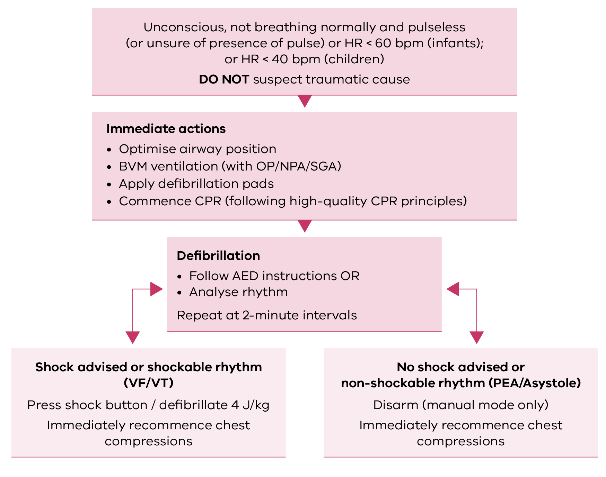
## General notes

* Cardiac arrest in children and infants is commonly caused by hypoxia. This guideline prioritises airway and ventilatory support.
* Respiratory arrest followed by bradycardic cardiac arrest may be corrected with ventilation prior to commencing chest compressions.
* Small children, infants and newborns may need a small amount of padding beneath the shoulders to keep the occiput from causing too much flexion of the head and compressing the neck. Be cautious with head and neck extension in children < 8 years.
* For the purposes of the CPPs, an automatic external defibrillator (AED) is regarded as being the same as a semi‑automatic external defibrillator (SAED).
* An AED can be used in children if the appropriate settings and attachments are available. If not accredited in manual defibrillation and an AED without paediatric settings/attachments is the only option, it should be applied and utilized until further assistance arrives. If defibrillation is required, delivering a higher shock energy than the standard is less harmful than failing to defibrillate.
* If accredited in manual defibrillation, 4 joules per kg should be delivered rounded up to the nearest setting.

## 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.

Figure 5. cardiac arrest algorithm - paediatric



# CPP006: Clinical escalation

Whilst the regulations stipulate that NEPT providers are to not routinely transport haemodynamically unstable patients and the CPPs present VSS which would indicate the transport is not suitable for NEPT, situations may arise where this occurs.

Presented below are some options which NEPT crew members may consider to escalate care if the patient presentation no longer falls within their scope to manage.

* Escalate to AV care via provider communications or through Triple Zero ‘000’.
* If conducting IFT from a medical facility or hospital and NEPT crew members still at facility, consider what management options available at sending facility and escalate care using normal means within facility, for example, ‘MET call’.
* If unable to contact AV or other relevant communications centre in the case of significant event, emergency or disaster that is likely to overwhelm communications systems (for example, thunderstorm asthma or bushfire emergencies), NEPT providers and crew members may commence transport to the closest emergency department or other source of higher-level clinical care or support.

Once this is completed, consider the following actions:

* Change type of VSS gained, for example, consider manual BP vs automatic BP.
* Change crew members if clinical grade is different or tasks overwhelm initial crew member.
* Refer to CPPs to pre-empt management options.
* Apply extra equipment where required or in anticipation of deterioration – for example, defibrillator pads or preparing resuscitation equipment.
* Contact for consultation with provider clinician OR AV clinician.
* Contact for consultation sending or receiving facility for management advice OR if still at sending facility assist with continued management of patient to optimise prior to transport.
* Consult with poisons information line in case of suspected toxicology presentation by calling   
  13 11 26.
* Pre-empting and communicating specialist resources that may be required following contact to AV – for example, MICA, AAV, Manual Handling assistance, Mobile Stroke Unit (MSU).
* Fax or picture messaging of ECG to appropriate consult for diagnostic cross-checking.
* Consult with specialist service (ARV or PIPER) for IFT. If contacting ARV or PIPER, state clearly that calling from a NEPT service.
  + ARV: 1300 368 661
  + PIPER: 1300 137 650
* Consider upgrade to urgent (‘code 1’) driving to reach transport destination or other appropriate health service.

NEPT providers are required to establish a clinical oversight committee to review instances where clinical escalation is required. NEPT crew members should submit instances of clinical escalation to the NEPT provider for consideration as part of the committee to determine root cause and whether variation to practice needs to be considered. Clinical escalation implies no fault on the part of a NEPT crew member and is a cornerstone of patient safety.

# CPP007: Oxygen therapy

Oxygen therapy should be directed toward correcting hypoxaemia and not resolving a feeling of breathlessness. Patients should not be routinely administered oxygen in the presence of normal oxygen saturations (SPO2), except in the case of critical illnesses including:

* cardiac arrest
* major trauma/head injury
* undifferentiated (or septic) shock
* anaphylaxis
* seizures.

For critical illnesses, oxygen should be administered regardless of SPO2.

Oxygen targets are as follows:

* Most patients should receive a target SPO2 of 94-98%.
* Chronically hypoxaemic patients (including COPD, cystic fibrosis, neuromuscular disorders, bronchiectasis, severe obesity) should receive oxygen titrated to achieve an SPO2 of 88-92%. Care must be taken to avoid the over-administration of oxygen in this patient cohort.
* Chronically hypoxaemic patients who also present with a critical illness should have oxygen applied until haemodynamically stable.

Where SPO2 is unavailable or unreliable and a patient appears short of breath, initial oxygen delivered by nasal cannula or face mask at 6-8L is appropriate until a reliable SPO2 level can be acquired. Situations where SPO2 may be unreliable include:

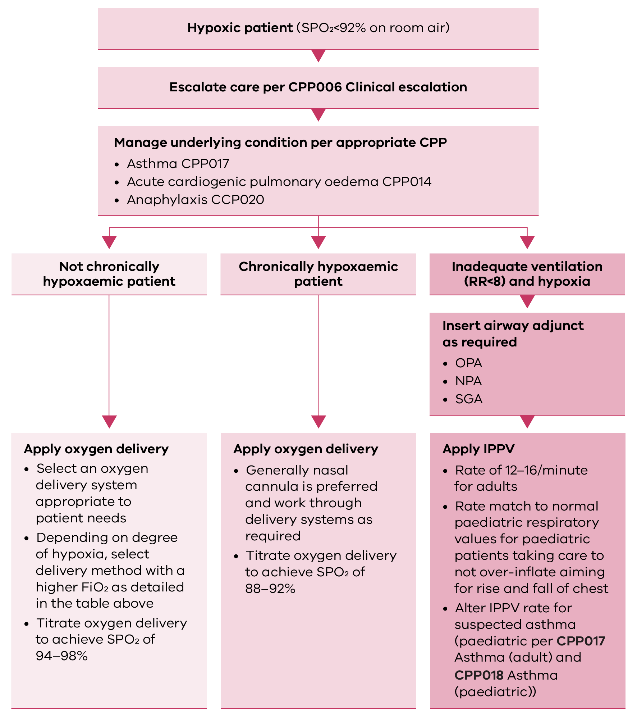
* peripheral vascular disease
* suspected carbon monoxide (CO) poisoning – the SPO2 measurement will not differentiate between carboxyhaemoglobin and oxyhaemoglobin and will present an artificially high reading. Where CO poisoning is suspected high flow oxygen should be applied.
* severely shocked patients with poor peripheral perfusion
* cold extremities.

As a general rule, when managing a hypoxic patient, a low SPO2 reading dictates selecting an oxygen delivery system with a higher fraction of inspired Oxygen (FiO2). The suggest flow rate and FiO2 of oxygen delivery systems are as follows:

Table 10. FiO2 and oxygen delivery system guide

|  |  |  |
| --- | --- | --- |
| Mask | FiO2 | Flow rate |
| Nasal cannulae | > 21-35 % | 1-6 L/min |
| Simple face mask (Hudson mask) | 40-60% | 6-8 L/min |
| Non-rebreather mask (NRB) | > 60% | 10-15 L/min |
| Bag valve mask (BVM) | 100% (with good seal) | 15 L/min or enough to inflate reservoir bag |
| Nebuliser mask (NEB) | 40-50% | 8 L/min |

Figure 6. Oxygen administration guidance



# CPP008: Narrow complex tachycardia (NCT)

Typically, tachyarrhythmias will present to high acuity services undertaking cardiac-related IFT, however may present as an incidental finding. Where there is an agreed management plan or medical order, in the case of a tachyarrythmia this takes precedence over the management options presented below.

Narrow complex tachycardias (NCT) present when a pacemaker site above the ventricles is firing abnormally. NCT ECG strips will have differences depending on the rhythm but share the characteristic of having a QRS complex < 0.12s and a rate > 100. NCT are generally divided into the following types which may be identifiable by NEPT crew members.

* Sinus tachycardia (STach)
* (Rapid) atrial fibrillation (R-AF)
* Paroxysmal supraventricular tachycardia (PSVT/SVT)
* Atrial flutter (AFlutter)
* Atrial tachycardia
* Junctional tachycardia.

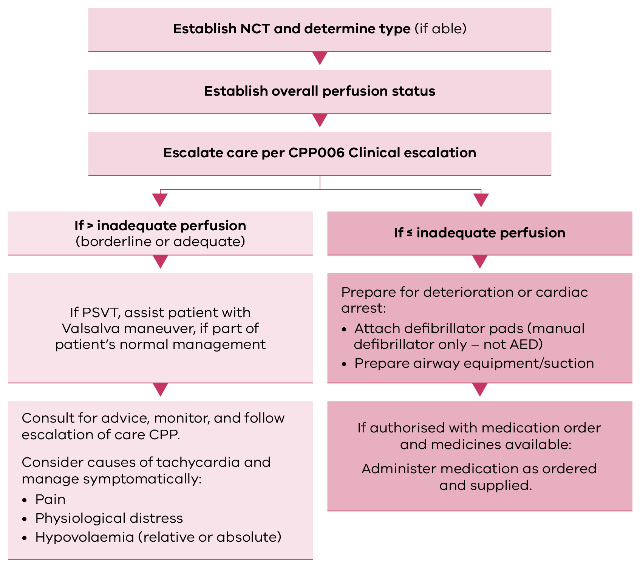
NEPT crew members should be suspicious of unexplained sinus tachycardias as this may be a sign of physiological distress.

Some common medicines that may be provided by sending health services to high acuity NEPT services include:

* Adenosine
* Calcium channel blockers (for example, diltiazem or verapamil)
* Beta blockers (for example, metoprolol or sotolol)
* Anti-arrhythmic medicines (for example, amiodarone or flecainide).

Synchronised cardioversion is not to be authorised for routine use by NEPT crew members.

Figure 7. Management of NCT



# CPP009: Wide complex tachycardia (WCT)

NEPT providers are not authorised to routinely commence transfer of a patient with a current WCT at time of transfer from a facility, however situations may arise where a WCT presents during the course of transport.

WCT is defined as:

* Lasting > 30 seconds
* Rate > 100
* QRS > 0.12 seconds
* Regular
* AV dissociation or absence of P waves.

WCT may present for a number of reasons, including:

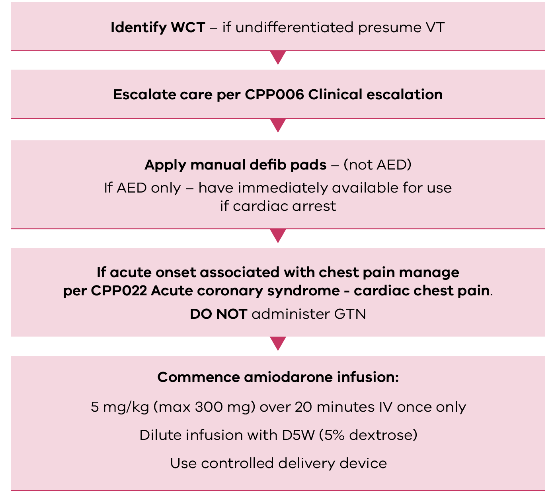
* cardiomyopathy
* acidosis
* coronary artery disease
* drug toxicity
* Hyperkalaemia.

In the out-of-hospital environment without access to further diagnostic facilities a WCT should always be presumed to be a ventricular tachycardia (VT) and managed with anti-arrhythmics unless specifically planned for (for example, transfer of a patient with known hyperkalaemia).

All WCT should be managed with a high degree of caution and with the assumption of deterioration regardless of perfusion status at time of presentation.

The majority of NEPT services will not require the management options contained within this protocol. Management of WCT will be an infrequent occurrence and therefore clinical consult as part of escalation is strongly recommended.

Figure 8. Management of WCT



# CPP010: Bradycardia

Bradycardia may be defined as a heart rate < 60 bpm however many people may have a heart rate between 50-60 bpm in their day-to-day lives.

Escalation of care and decision to transport should be guided by the ‘not suitable for NEPT’ criteria. The management indicated within this protocol relates to an unplanned presentation of symptomatic bradycardia during transport. Unstable symptomatic bradycardia requiring intervention is defined as the following:

* Less than adequate perfusion (for example hypotension or altered mentation)
* HR < 20 regardless of overall perfusion status
* Persistent ventricular escape rhythms or runs of VT in between bradycardia.

Note that atropine may not be effective in the case of a complete or 2nd degree type II heart block, however, should still be administered.

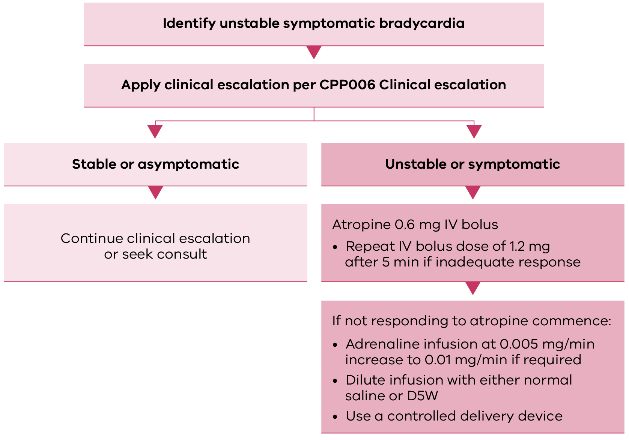
Occasionally high acuity NEPT may be required to transport patients who are undergoing investigation for bradycardia who have active management. Common medication infusions which may be encountered include:

* Isoprenaline
* Dopamine
* Adrenaline (epinephrine).

External transcutaneous pacing is not routinely authorised for use by NEPT crew members.

The majority of NEPT services will not require the management options contained within this protocol. Management of symptomatic bradycardia will be an infrequent occurrence and therefore clinical consult as part of escalation is strongly recommended.

Figure 9. Management of bradycardia



# CPP011: Sepsis recognition and escalation

Sepsis is a condition which spans a clinical continuum with a complex series of interactions of inflammatory responses and microvascular injury which ultimately may lead to a state of septic shock and is one of the leading causes of preventable death worldwide.

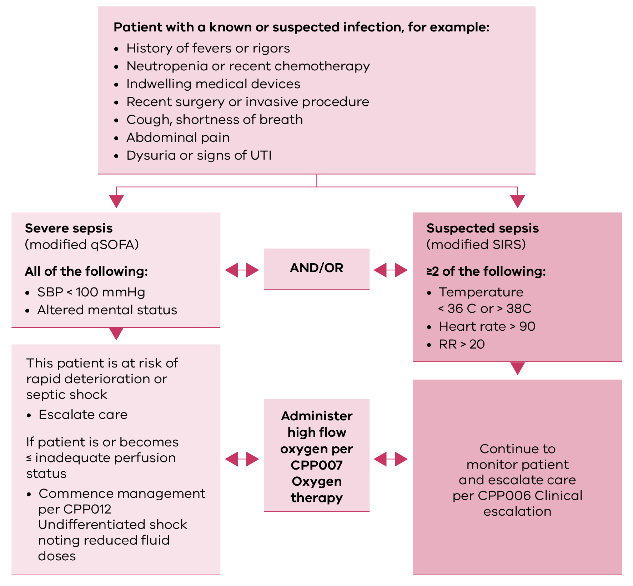
NEPT services are often the transport means for vulnerable members of the community with the potential for any infective process to progress into sepsis. The following are some risk factors for infection progressing to sepsis:

* Elderly patients
* Compromised immune system including patients undergoing chemotherapy treatment
* Chronic kidney or liver disease
* Admission to hospital for a significant length
* Recent antibiotic administrations
* Invasive devices, for example an in-dwelling catheter (IDC).

For this reason, an NEPT specific sepsis recognition and escalation pathway has been developed to assist NEPT crew members to identify and escalate care. While management options may be limited in NEPT services, early identification and escalation of care is aimed at preventing severe complications of sepsis.

Criteria have been developed based on a modified systemic inflammatory response syndrome SIRS criteria and a modified sepsis related organ failure (qSOFA) criteria with the recognition that blood analysis, in particular blood lactate and white cell count (WCC), is not feasible in the NEPT environment.

Figure 10. Sepsis recognition and management



# CPP012: Undifferentiated shock

NEPT crew members may encounter patients who are in a state of shock as an incidental finding during the course of unplanned NEPT activities, such as when responding to cases generated by Triple Zero ‘000’ or SHEMP activations or as an acute deterioration during IFT.

Shock can be defined as a state of cellular and tissue hypoxia due to either reduced oxygen delivery, increased oxygen consumption, inadequate oxygen utilization or a combination of these processes.

It is important to consider a patient’s overall perfusion status when determining shock. The most visible marker of shock is profound hypotension and for this reason may be the decision point to initiate intervention. Overall perfusion status should be established using the perfusion status assessment table 2.

Shock is divided into different types based on the cause. Table 12 lists the types of shock and common examples:

Table 12. Shock types

|  |  |
| --- | --- |
| Shock type | Example cause(s) |
| Obstructive shock  (unlikely during NEPT service delivery) | * Tension pneumothorax * Haemothorax * Cardiac tamponade |
| Cardiogenic shock | * Acute myocardial Infarction * Tachyarrhythmias * Bradyarrhythmias |
| Distributive shock | * Sepsis * Anaphylaxis * Neurogenic shock |
| Hypovolaemic shock  (unlikely during NEPT service delivery) | * Lack of blood volume (haemorrhage) * Lack of systemic volume (vomiting, diarrohea, burns) |

NEPT crew members should consider management of specific conditions relevant, which may   
lead to a shocked state, and manage these as per the applicable CPP, For example:

* Anaphylaxis should prioritise management with adrenaline (epinephrine) according to   
  CPP020 Anaphylaxis.
* Bradycardia should prioritise management to increase heart rate according to CPP010 Bradycardia.
* Tachyarrthymias should prioritise a decrease in heart rate according to CPP008 Narrow complex tachycardia or CPP009 Wide complex tachycardia.
* Cardiogenic shock associated with ACS should be managed according to CPP013 Cardiogenic shock.

NEPT high acuity services may transport patients who have a condition that would lead to a shocked state provided that these patients are not expected to deteriorate enroute and are stable at time of transfer. Prior to departure from the sending facility a plan for deterioration needs to be agreed upon with a medication order and infusion schedule prepared.

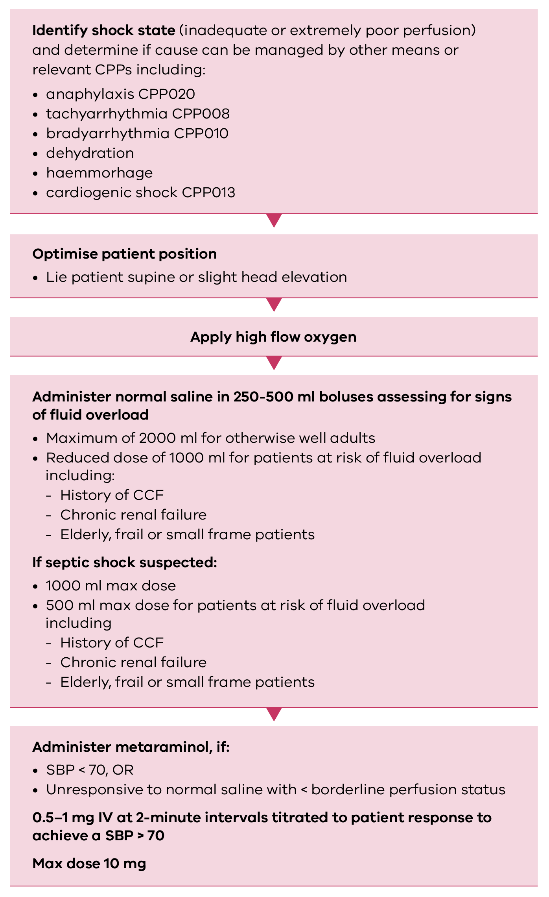
Some common vasopressors:

* Noradrenaline (norepinephrine)
* Adrenaline (epinephrine)
* Vasopressin
* Dopamine
* Phenylephrine
* Dobutamine.

Management options presented below represent management of an undifferentiated acute shock state and/or following initial unsuccessful management of a presumed cause for which no other management option is presented.

The majority of NEPT services will not require the management options contained within this protocol. Management of undifferentiated shock will be an infrequent occurrence and therefore clinical consult as part of escalation is strongly recommended.

Figure 11. Management of undifferentiated shock



## CPP013: Cardiogenic shock

Cardiogenic shock can be defined as a shock state (SBP <90 mmHg) from a primary cardiac disorder. For purposes of intervention, this CPP refers to a patient with ≤ inadequate perfusion as defined on listed in table 2. The most common causes of cardiogenic shock likely to be recognised by NEPT crew members and encountered during NEPT service delivery, and that this CPP applies to, include:

* acute myocardial ischaemia (AMI)
* pulmonary embolus
* right ventricular failure
* overdose of cardiotoxic trugs, medication overdoses (beta/calcium channel blockers).

NEPT crew members must not transport a patient who has experienced cardiac chest pain within 2 hours of presentation.

Other causes of shock should be managed per CPP009 Undifferentiated shock. For tachy/brady-arrhythmias this should be managed per the relevant CPP.

Care should be applied by high acuity services when managing with adrenaline (ephinephrine) as the effects will increase myocardial workload and consequently metabolic demand. The majority of NEPT services will not require the management options contained within this protocol. Management of cardiogenic shock will be an infrequent occurrence and is therefore clinical consult as part of escalation is strongly recommended.

Figure 12. Management of cardiogenic shock



# CPP014: Acute cardiogenic pulmonary oedema (ACPO)

Acute pulmonary oedema can be defined as an accumulation of excessive fluid in the alveolar walls and alveolar spaces of the lung. This manifests in the following ways.

* Compromised respiratory status.
* Hypoxia.
* Orthopnea (increasing shortness of breath or feeling of drowning whilst supine).

Pulmonary oedema can be classified as cardiogenic (resulting from an issue with the heart) or non-cardiogenic. Non-cardiogenic pulmonary oedema usually results from direct injury to the lung parenchyma (tissue) or vasculature or as a result of volume (fluid) overload and is not covered by this CPP. If non-cardiogenic pulmonary oedema is encountered and recognised, management should be targeted to correct hypoxia as described in CPP007 Oxygen therapy and supportive care.

ACPO is likely to be seen during NEPT service delivery as an incidental finding whilst conducting unplanned (non IFT) service delivery or during the transport of patients with chronic issues such as:

* coronary artery disease with left ventricular failure
* congestive heart failure
* cardiomyopathy
* valvular heart diseases
* cardiac dysrhythmias
* right to left shunts.

Clinical indicators that may assist a provisional diagnosis of ACPO include:

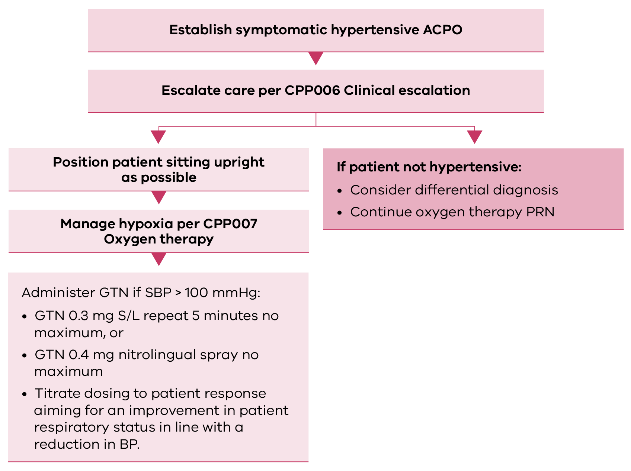
* excessive shortness of breath on exertion
* excessive sweating or diaphoresis
* blood-tinged or pink sputum in severe presentations
* chest pain – if associated with an acute cardiac event
* significant hypertension – and if present, is an indication of severe left ventricular systolic dysfunction and patient may require management per CPP013 Cardiogenic shock
* dependent oedema
* ‘crackles’ heard on chest auscultation.

NEPT crew members may transport patients with chronic pulmonary oedema provided there is no acute deterioration present or forecast, no recent change in patient condition and the patient’s physiological status would not otherwise make the patient ineligible for NEPT transport.

The use of non-invasive ventilation (CPAP/Bi-Level) is not authorised for routine use by NEPT services but may be considered by high acuity services if an escort is provided or the attending NEPT crew member is endorsed and a clinical plan is developed with sending facility prior to transport. In this unusual circumstance the patient should be stable on the NIV prior to transfer. The use of NIV must not occur during air transport.

The management of ACPO in NEPT service delivery is targeted at reducing blood pressure and improving hypoxia.

Figure 13. Management of acute cardiogenic pulmonary oedemea



# CPP015: Stroke

Acute stroke is the second leading cause of death worldwide and the leading cause of disability. There are two main types of stroke – ischaemic and haemorrhagic. Both types of stroke are time-critical and very difficult to differentiate in the out-of-hospital environment without access to medical imaging services. The key objective is identification of stroke symptoms and rapid transfer.

For the purposes of this CPP, stroke is defined as a set of neurological signs and symptoms that together would indicate a stroke even if symptoms are improving or have improved.

#### Melbourne ambulance stroke screen (MASS)

In the setting of a normal blood glucose level (BGL), an abnormal finding in one or more of the following is MASS positive for suspicion of stroke.

Table 13. Stroke symptoms

|  |  |  |  |
| --- | --- | --- | --- |
|  | Instruction | Normal finding | Abnormal finding |
| Facial droop | Patient to show teeth or smile | Both sides of the face move | One side of the face does not move as well as the other |
| Speech | Patient to repeat ‘you can’t teach an old dog new tricks’ | Patient says the correct words with no slurring | Patient slurs words, says incorrect words or is unable to speak or understand |
| Hand grip | Patient to squeeze your fingers | Equal grip strength | Unilateral weakness |

Alternatively, any concerning acute-onset unexpected symptom(s) which cannot be explained should be escalated. Such symptoms include:

* prolonged gaze toward one side of the body
* favouring one side of the body and/or uneven gait
* disinhibition of speech (that is, inappropriate words)
* impaired judgement
* spontaneous urinary incontinence
* vertigo not normal presentation
* ataxia (clumsy involuntary movements)
* visual field disturbances
* altered conscious state or acute onset confusion.

Presumed time of stroke should be from when patient was last seen well. Stroke treatment timeframes are longer than previously thought.

* Thrombolysis up to 12-hours post-stroke
* Endovascular Clot Retrieval (ECR) up to 24 hours post-stroke

All patients who present to NEPT services that are MASS positive or display concerning neurological signs and symptoms must have care escalated.

NEPT services may be directed to transport stroke patients if it is outside the window for management or the patient is unlikely to receive further management, for example, if the patient relies on others for all activities of daily living.

The use of NEPT to transport confirmed stroke patients for ECR from a facility that has initiated thrombolysis is not routinely endorsed. If this occurs on direction of the AV communications centre, NEPT crew members are to ensure that management priorities and escalation points are discussed prior to departure from the sending facility.

# CPP016: Headache

Headaches may present during NEPT service delivery and be characterised in a number of ways. It is not possible or realistic to classify different headache types during NEPT service delivery and as such the goal should be identification of symptoms of concern which may indicate a serious cause for the headache, escalation of care where these symptoms are identified and analgesia to provide relief from symptoms.

NEPT services are not authorised to routinely transport patients experiencing an undiagnosed headache which is not typical for the patient.

In addition to standard assessment, symptoms of concern include:

* Sudden onset
* Significant pain at time of initial presentation
* Visual disturbances
* Significant hypertension
* Other abnormal neurological signs or symptoms
* Unilateral headache
* Nausea and vomiting

If these symptoms present NEPT services should escalate care as per CPP005 clinical escalation.

Management of pain should be as per CPP029 pain relief with a preference to commence management with oral paracetamol.

# CPP017: Seizures

Seizures are a sign of abnormal brain activity and involve a complex relationship of neurotransmitters. It is important to be aware that not every seizure presents the same. Seizures can be classified in the following ways, which NEPT crew members may recognise:

* Generalised
* Tonic-clonic (generalised convulsive seizure) - involves rhythmic muscle jerking with a loss of consciousness
* Absent seizures – patient presents with a vacant look and is unresponsive, generally self-limiting
* Myoclonic – results in a sudden jerking of a part of the body
* Atonic – involves a sudden loss of muscular control,
* Partial
* Simple focal – a seizure that involves one part of the brain, leaving the person with awareness but unable to respond
* Complex focal – seizure activity in one part of the brain, where the person is not aware, may lose focus, appear dazed or confused

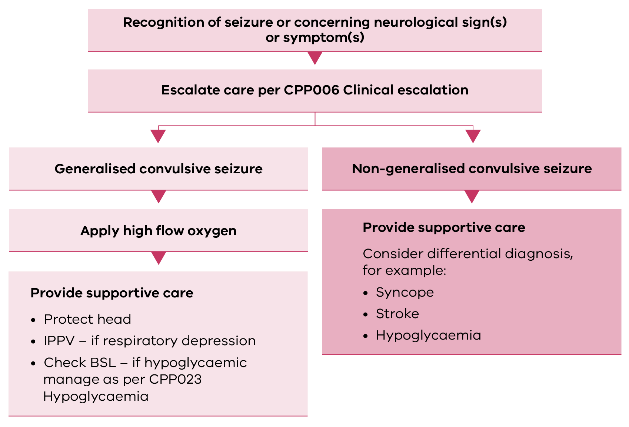
Seizures may present due to a number of causes, such as:

* stroke
* infective process including encephalitis or meningitis
* brain tumour
* drugs and medications
* epilepsy
* head injury
* febrile seizures (paediatric)
* pregnancy (eclampsia).

For NEPT services the recognition of any type of seizure activity or concerning neurological sign(s) or symptom(s) should lead to prompt clinical escalation and supportive care. NEPT crew members should note the time of seizure activity commencing and its duration. It is important to recognise that ongoing seizure activity may have pronounced effects on BP, airway tone and oxygenation.

NEPT crew members should not attempt to control or physically restrain somebody experiencing a seizure or attempt to place anything in the patient’s mouth. Suction is rarely required and should only be used if the airway is occluded, when applied it is to be short duration (<5 seconds in any one attempt) and confined to the oropharynx.

Figure 14. Management of seizures



# CPP018: Asthma – adult

Bronchospasm is defined as a spasm of bronchial smooth muscle leading to narrowing of the bronchi and consequently a reduction in air moving in (reduced oxygen intake) and out of the lungs (reduced removal of carbon dioxide).

Bronchospasm is managed in different ways depending on the underlying condition. Management is targeted towards the resolution of spasm and a reduction in inflammatory mediators which lead to bronchospasm.

Asthma causes the muscles in the airways to tighten and the lining of the airway to become swollen and inflamed, producing sticky mucous. These changes cause the airways to become narrow, making it difficult to breathe. Asthma may have a number of triggers including:

* allergy triggers such as house dust mites, pollens, pets and moulds.
* cigarette smoke
* viral infections – for example, colds and flu
* cold air or changes in the weather
* work-related triggers – for example, wood dust, chemicals, metal salts
* some medication.

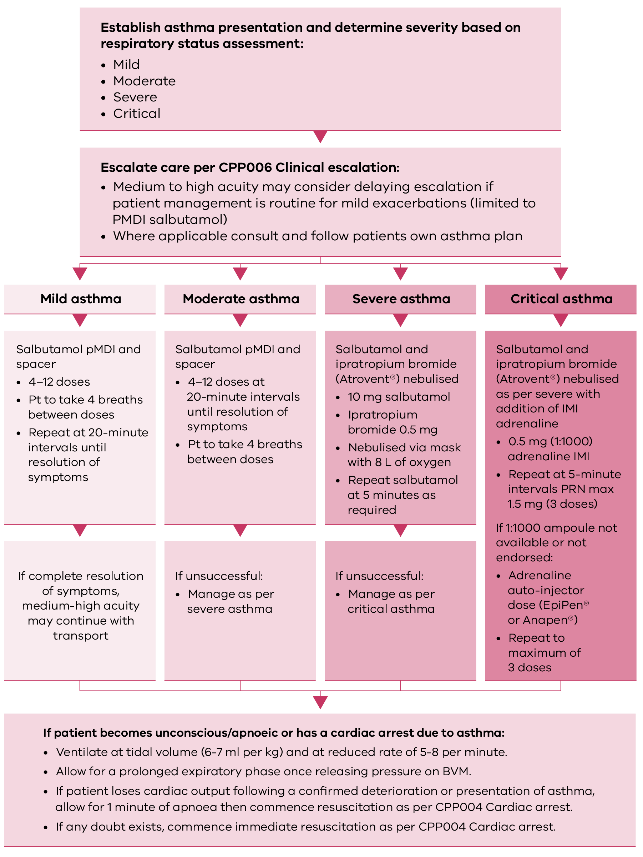
In Australia, asthma is usually a well-controlled condition, and most patients will be aware of an asthma exacerbation. Clinically, asthma may present with the following signs and symptoms signifying an exacerbation.

* Increased shortness of breath
* Wheezing on auscultation or audible without auscultation
* Tachycardia
* Sweating.

Where patients experience an acute exacerbation of their asthma, management is dictated by the patient’s respiratory status. Patients that respond to management of mild to moderate asthma with a complete resolution of symptoms may continue transport with a NEPT service provided no physiological parameter would otherwise make the patient ineligible for NEPT transport.

Where patients present with bronchospasm of a cause other than asthma (for example, smoke inhalation) or for which no other protocol exists (for example, COPD) they should be managed using interventions detailed in this protocol, except for the use of IM adrenaline.

Figure 15. Management of asthma



## Thunderstorm asthma

Thunderstorm asthma poses a significant risk in Victoria during defined time periods, usually commencing in October and ending in December or early January annually.

The department releases [high risk mapping and guidance for thunderstorm asthma](https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma-risk-forecast) <https://www.health.vic.gov.au/environmental-health/epidemic-thunderstorm-asthma-risk-forecast>.

NEPT providers may be activated as part of a SHEMP response to manage significant escalations relating to thunderstorm asthma and NEPT service providers should subscribe to alerts.

Where NEPT crew members suspect a thunderstorm asthma event or are entering a declared thunderstorm asthma event, consideration should be given to early IMI adrenaline delivery (either from a 1:1000 ampoule or from an auto-injector device). If there is a delay to normal means of clinical escalation including emergency ambulance services, NEPT crew members are authorised and encouraged to commence transport (instead of remaining on scene) to an appropriate ED if escalation through normal means is not possible.

# CPP019: Asthma – paediatric

The general background and identification of asthma is similar to that of adult patients and management goals the same with the following considerations:

* Asthma exacerbations may be more dynamic with a lower threshold for clinical escalation required.
* Nebulised therapy should be reserved for paediatric patients who present as severely unwell.
* Early consideration should be given to IMI Adrenaline for severely unwell children.
* Any exacerbation of paediatric asthma should involve an escalation of care.

Paediatric patients should be assessed using Table 14 (based on the paediatric assessment triangle) to determine severity prior to initiation of therapy.

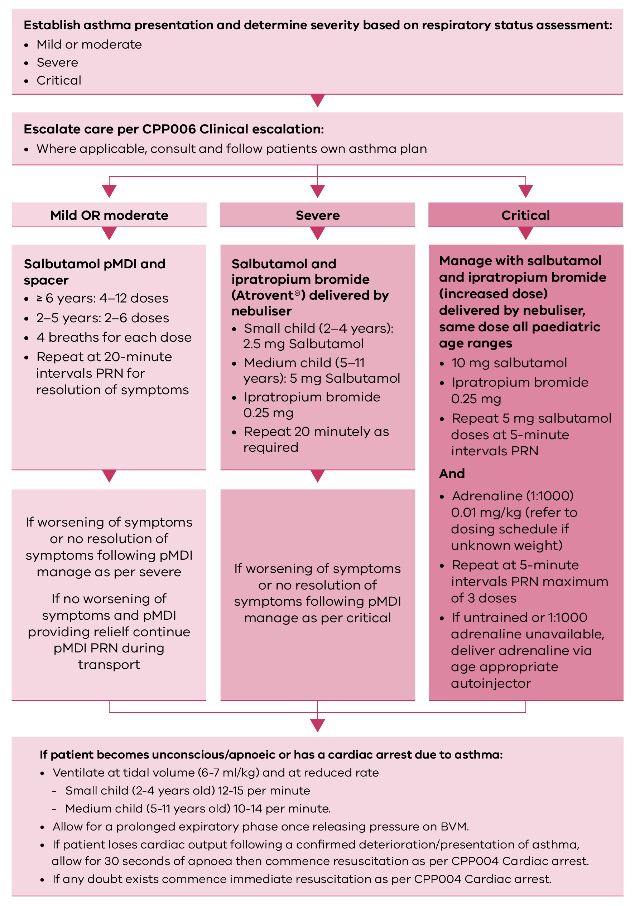
Table 14. Paediatric asthma severity clinical features

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mild/moderate | Severe | Critical |
| Conscious state | Normal | Distressed | Altered |
| Work of breathing | Increased | Markedly increased | Maximal |
| Tachycardia | Tachycardia | Tachycardia | Marked tachycardia |
| Speech | Phrase/sentence | Words | Unable to speak |

Table 15. Paediatric IMI adrenaline doses

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age (years) | ≥ 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Dose of 1:1000 Adrenaline (IMI | 0.12 mg  (0.12 ml) | 0.14 mg  (0.14 ml) | 0.16 mg  (0.16 ml) | 0.18 mg  (0.18 ml) | 0.2 mg  (0.2 ml) | 0.22 mg  (0.22 ml) | 0.24 mg  (0.24 ml) | 0.26 mg  (0.26 ml) | 0.33 mg  (0.33 ml) | 0.36 mg  (0.36 ml) |

Figure 16. Management of asthma - paediatric



# CPP020: Chronic obstructive pulmonary disease (COPD) exacerbation

COPD can be defined as an irreversible chronic inflammatory lung disease causing an obstructed airflow to and from the lungs which may present to NEPT services as a periodic exacerbation. Chronic bronchitis and emphysema are the two most common conditions contributing to COPD, and management of an exacerbation is targeted to relieve symptoms associated with this including bronchoconstriction and hypoxia.

It is important to avoid the over-administration of oxygen to patients suffering from an exacerbation of COPD and generally an SPO2 target of 88 per cent should be accepted.

COPD should be suspected in the patients over 40 years of age with:

* smoking history
* progressively worsening dyspnoea (difficulty breathing) that has become worse
* poor exercise tolerance
* chronic cough or sputum production.

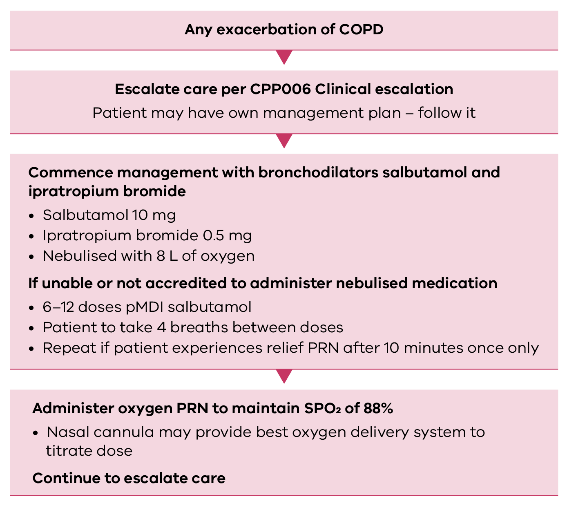
An exacerbation of COPD should be considered and managed in patients who present with:

* increased dyspnoea (worse than base level)
* increasing cough and sputum production
* increased wheeze.

NEPT crew members must take care to not cause an exacerbation of COPD. Patients with COPD who are to be transported can have the risk of exacerbation reduced by:

* minimising exercise or effort during transfer
* slow, deliberate and careful planning of transfers
* use of wheelchair or stretcher to reduce effort.

Figure 17. Management of acute exacerbation of chronic obstructive pulmonary disease



# CPP021: Anaphylaxis: adult

Anaphylaxis may be defined as a severe, potentially life-threatening, systemic hypersensitivity reaction characterised by rapid onset of a life-threatening airway, breathing or circulatory problem(s) with usual (but not always) skin and mucosal changes. Anaphylaxis is becoming more prevalent within the Australian population and NEPT providers and crew members must be vigilant to ensure anaphylaxis is recognised and managed where it presents.

Some common triggers of anaphylaxis:

* Insect stings
* Food – commonly nuts, eggs, shellfish, fish, soy and wheat
* Medications – including parental, enteral and topical
* Physical exercise or cold
* Biological triggers – idiopathic (no known cause), latex and antivenoms

## Recognition of anaphylaxis (RASH criteria)

Anaphylaxis can be suspected using the following criteria (‘RASH +’):

* Sudden onset of symptoms (usually < 30 min or up to 4 hours),

AND

* Two or more of RASH
  + R: Respiratory distress
  + A: Abdominal symptoms (vomiting, nausea, diarrhoea)
  + S: Skin or mucosal symptoms (rash, discolouration or mucous secretion)
  + H: Hypotension (SBP < 90)

OR

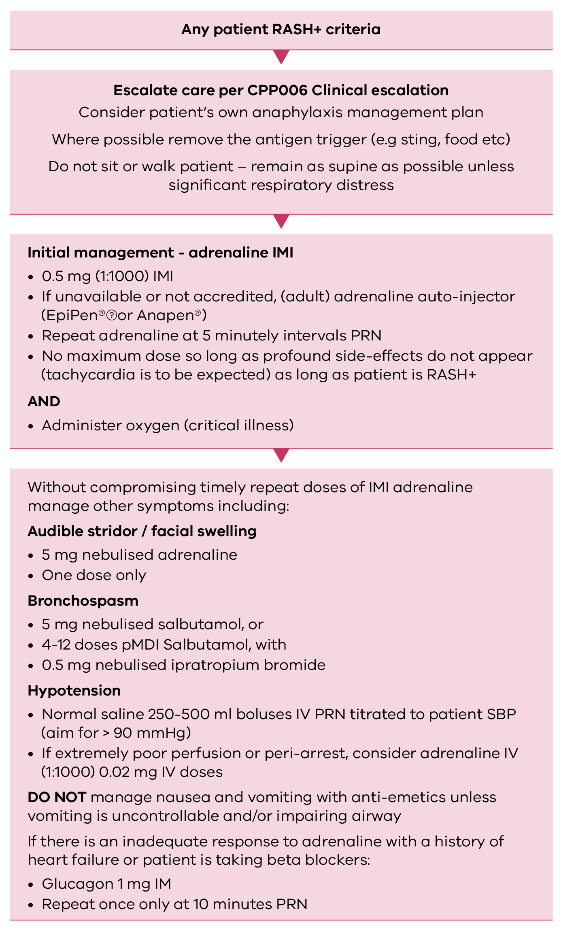
* + Isolated hypotension (SBP < 90mmHg) following exposure to a *known* antigen,

OR

* + Isolated respiratory distress following exposure to a *known* antigen.

Where doubt exists about the diagnosis of anaphylaxis in the absence of any definitive other differential diagnosis, manage as per anaphylaxis and escalate care early.

Anaphylaxis management is centred around early intervention with IMI adrenaline. Other considerations should follow and not interrupt regular IMI adrenaline doses.

Figure 18. Management of anaphylaxis - adult

# CPP022: Anaphylaxis – paediatric

The background information, recognition (RASH+ criteria) and management goals of anaphylaxis are broadly similar to the adult population. Below is a modified protocol for paediatric anaphylaxis:

#### Recognition of anaphylaxis (RASH criteria)

Anaphylaxis can be reasonably suspected using the following criteria (‘RASH +’):

* Sudden onset of symptoms (usually < 30 min or up to 4 hours)

AND

* Two or more of RASH. If two or more symptoms, consider differential diagnosis. If nothing obvious or easy to confirm, manage as anaphylaxis.
  + R: Respiratory distress
  + A: Abdominal symptoms (vomiting, nausea, diarrhoea)
  + S: Skin or mucosal symptoms (rash, discolouration or mucous secretion)
  + H: Hypotension (SBP < 90)

OR

* + Isolated hypotension (SBP < 90mmHg) following exposure to a known antigen

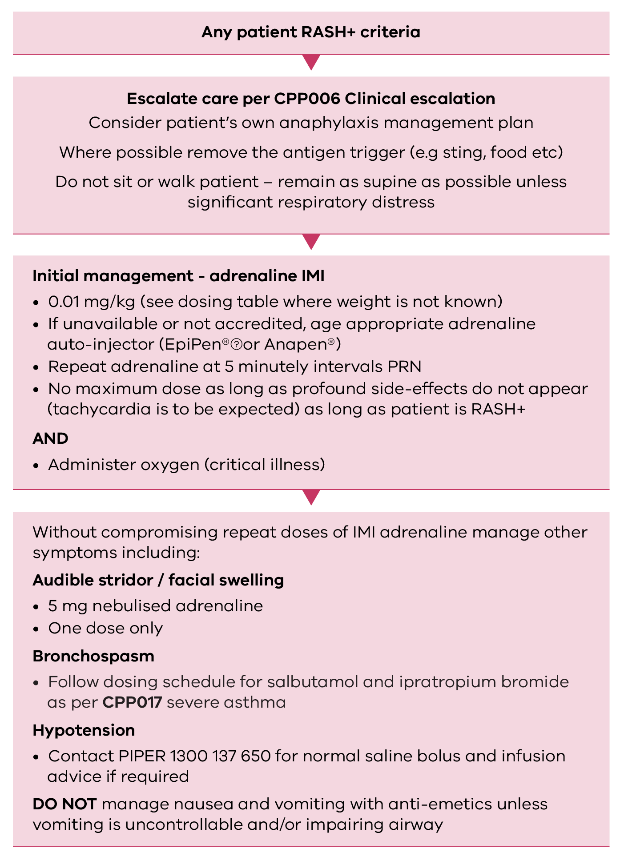
OR

* + Isolated respiratory distress following exposure to a known antigen.

Where doubt exists about the diagnosis of anaphylaxis in the absence of any definitive other differential diagnosis, manage as per anaphylaxis and escalate care early.

Anaphylaxis management is centred around early intervention with IMI adrenaline. Other considerations should follow and not interrupt regular IMI adrenaline doses.

Contact PIPER on 1300 137 650 for guidance for ongoing management. Clearly state position and that the call is coming from a NEPT service.

Figure 19. Management of anaphylaxis - paediatric

# CPP023: Acute coronary syndrome – cardiac chest pain

Acute coronary syndrome (ACS) can be defined as a group of diseases in which blood flow to the heart is decreased. Specifically, ACS that this protocol applies to include:

* ST-elevation myocardial Infarction (STEMI)
* non-ST elevation acute coronary syndrome (NSTEAC), including non-ST elevation myocardial infarction (NSTEMI) and unstable angina
* persistently increasing angina without definitive evidence of myonecrosis (heart muscle damage).

For the purposes of NEPT service delivery, the presence of suspicious acute central chest pain or epigastric pain which cannot be explained by other definitive diagnosis, should lead NEPT crew members to suspect ACS and manage accordingly.

Some other symptoms of concern include:

* nausea or vomiting
* diaphoresis
* ECG abnormalities
* pain radiating to jaw or back
* pain in chest or epigastric region that is described as aching, pressure, tightness or burning
* dyspnoea.

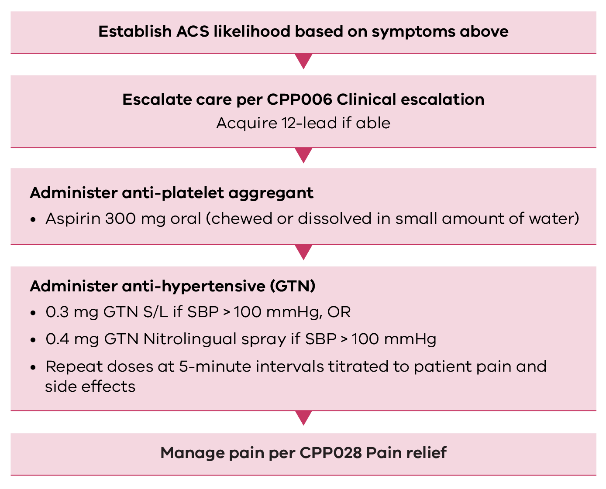
The goal of NEPT management of ACS is to reduce platelet aggregation through the administration of aspirin, rapid clinical escalation, a reduction in myocardial workload by reducing hypertension with GTN, and pain relief.

In the case of ACS, the complete removal of pain is unlikely. The goal of analgesia should be to provide a level of pain relief which the patient considers mild.

12-lead ECGs may be acquired by NEPT services where there is capacity and appropriate equipment. Where a suspicious ECG is identified, this should be communicated as part of clinical escalation.

Management of associated symptoms (for example, nausea and vomiting, pain relief, acute cardiogenic pulmonary oedema) should be conducted as per the appropriate CPP.

Figure 20. Management of acute coronary syndrome



# CPP024: Hypoglycaemia

Hypoglycaemia is defined as blood glucose level (BGL) concentration less than 4 mmol/L. Signs and symptoms of hypoglycaemia may not occur until levels lower than this and may include:

* altered level of consciousness (or unconscious)
* agitation
* dizziness
* increased appetite
* sweating.

Hypoglycaemia is usually found in patients who have diabetes and are undergoing management with insulin, meglitinides and sulfonylureas. Accidental overdoses of medication (usually relative to the amount of energy intake the person is consuming) are the most common cause of hypoglycaemic episodes. Hypoglycaemia may also be found in certain patient cohorts who are not diabetics including:

* alcoholic patients
* patient with critical illness or trauma
* patients suffering from counter-regulatory hormone deficiencies
* patients with some cancers.

Hypoglycaemia management is aimed toward correcting the low BGL and supportive care including airway security (if required).

It is important to note that glucagon may not be effective in patients who have low stores of glycogen, including:

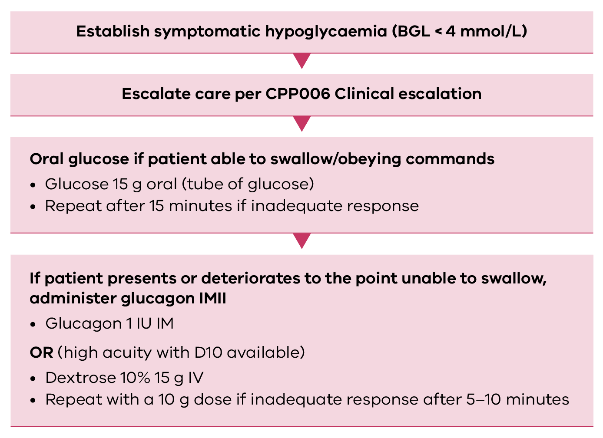
* frail or elderly
* people on low carbohydrate diets
* alcoholic patients.

For patients who present with any of the symptoms of hypoglycaemia listed above but who have a BGL great than 4 mmol/L, it is important to consider other potential causes including:

* stroke
* seizure (absent seizure)
* shock-state
* tumour.

If a patient presents able to swallow and obeying commands, medium-high acuity services may attempt management with oral glucose prior to escalating care. If correction of symptoms and BGL occurs after one dose and physiological parameters do not preclude transport by NEPT, continue transport.

Figure 21. Management of hypoglycaemia



# CPP025: Hyperglycaemia

Hyperglycaemia is defined as blood glucose level (BGL) concentration greater than 11 mmol/L.

Diabetic ketoacidosis (DKA) and hyperosmolar hyperglycaemic state (HHS) represent the extreme in the spectrum of hyperglycaemia. DKA and HHS are classified as medical emergencies and are a leading cause of mortality among diabetic patients.

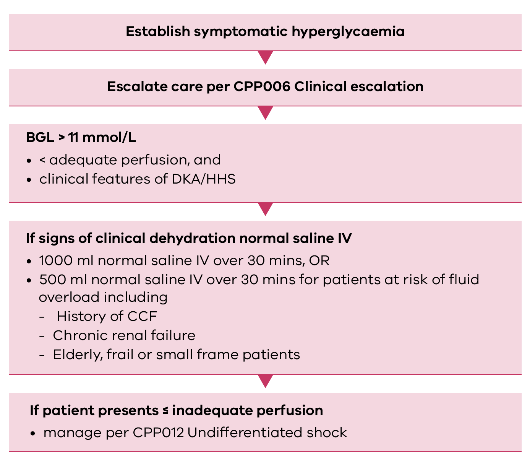
DKA and HHS may occur in both type 1 and type 2 diabetes mellitus. DKA typically evolves within a few hours, whereas HHS has a slower onset of days to weeks.

Signs and symptoms of hyperglycaemic presentations include:

* altered level of consciousness (or unconscious)
* agitation
* dizziness
* seizure
* sweating
* polydipsia
* polyuria
* presence of ketones.

There is limited value in differentiating between hyperglycaemic crises during NEPT service delivery. Care for the hyperglycaemic patient, in the NEPT context, centres around general supportive care, clinical escalation and fluid replacement where indicated and within scope.

Figure 22. Management of hyperglycaemia



# CPP026: Nausea and vomiting

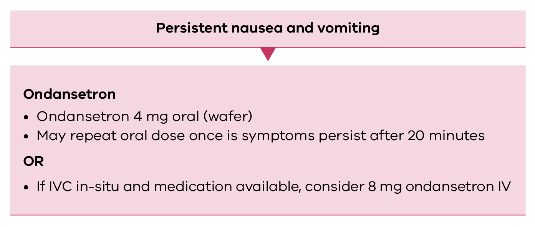
Nausea and vomiting are caused by a complex series of interactions between different nervous system pathways with different causes including:

* vestibular nausea
* medications in particular chemotherapy
* allergies
* migraines and headaches
* ocular injury
* acute coronary syndrome.

It is important to note that severe, uncontrollable and undifferentiated nausea and vomiting may be a sign of critical illness and care should be escalated.

The aim of this CPP is to provide management with an anti-emetic (ondansetron) that has an effect on both the vomiting centres within the nervous system and in the gastro-intestinal system to reduce negative side effects of uncontrollable nausea and vomiting. Often simple nausea and single-episode vomiting that is able to be tolerated does not require the administration of an anti-emetic.

Figure 23. Management of nausea and vomiting



# CPP027: Foreign body airway obstruction (FBAO)

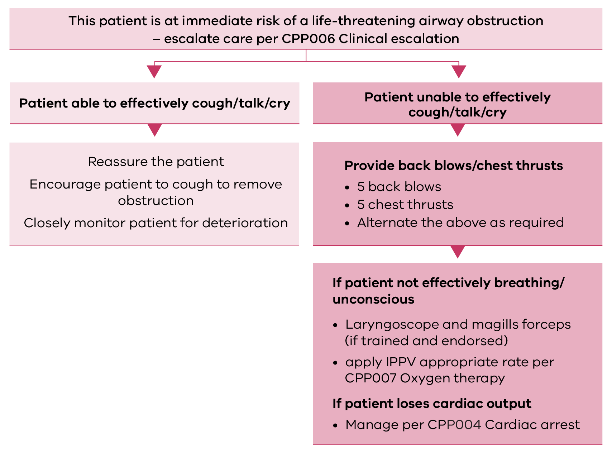
FBAO is a life-threatening emergency that is more common in the paediatric population, but with a higher mortality rate for adults in the out-of-hospital environment. FBAOs may be partial or complete obstructions. FBAO may result in inadequate or complete air flow to or from the lungs leading to insufficient oxygen exchange at a cellular level.

Key indicators of a partialairway obstruction include:

* clutching at throat
* cough
* crying or verbal response
* stridor or wheeze
* adequate or altered perfusion status
* normal or altered CGS
* respiratory difficulty.

Key indicators of a complete airway obstruction include:

* clutching at throat
* ineffective or absent cough
* absence of crying or verbal response
* absence of stridor or wheeze
* inadequate perfusion status
* lack of consciousness
* absence of ventilation

Figure 24. Management of suspected FBAO

# CPP028: Laryngectomy and tracheostomy care

This CPP is not for the purpose of creating a surgical airway. Its purpose is to give guidance in the event of airway emergencies associated with patients who have an existing tracheostomy or laryngectomy that NEPT services are likely to encounter. NEPT services are not authorised to transport patients where difficulty with an airway is forecast.

A tracheostomy is a surgical opening in the anterior neck and trachea to allow direct access into the trachea to facilitate ventilation for a variety of reasons. Tracheostomy patients can breathe through their stoma and through their mouth or nose to some extent. A tracheotomy tube with or without an inner tube may be present.

A laryngectomy is the surgical removal of the larynx and separation of the airway from the mouth, nose and oesophagus. Ventilation will be facilitated though a tracheotomy stoma. Importantly, patients with a laryngectomy cannot be ventilated or oxygenated via the mouth. A tube is usually not present. Other devices such as laryngeal buttons or speaking valves may be in situ.

* all NEPT acuity levels may transport a patient who lives daily with a surgical airway in situ provided no complications are forecast.
* NEPT high acuity services may transport patients with a recent surgical airway insertion > 5 days prior to transport
* patients with a surgical airway which has been inserted within 5 days prior to transport must be transported with a suitably qualified medical practitioner escort.

Figure 25. Placement of different surgical airway types

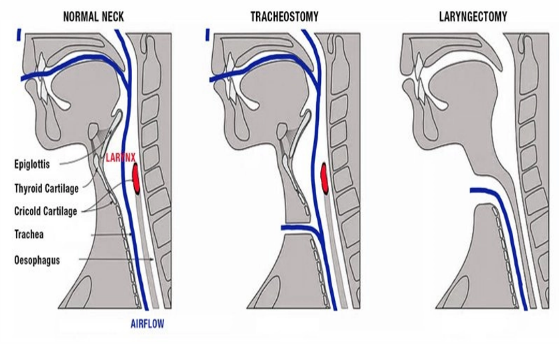
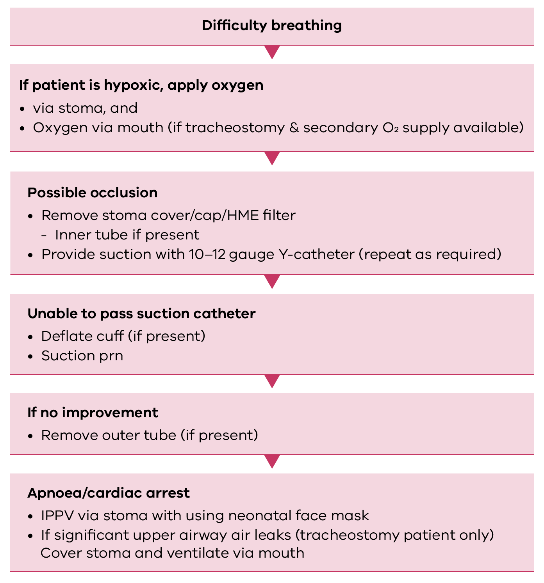


Figure 26. Management of surgical airway emergencies



# CPP029: Pain relief

The key areas of appropriate pain management include:

* pain assessment
* provision of appropriate analgesia based on pain assessment
* re-assessment and management of pain following analgesia.

## Pain assessment

Assess pain using the most appropriate pain assessment tool(s) such as OPQRST/DOLOR, verbal rating scale, numeric rating scale and Wong-Baker FACES pain scale.

An inability to report or rate pain (for example, dementia, intellectual disability, neurodiversity, NESB) should not preclude analgesia. Where discomfort is evident in the setting of possible pain producing stimuli, analgesia may be indicated.

## Non-pharmacological management

Basic care and non-pharmacological management of pain is fundamental and should be considered prior to pharmacological management. This includes:

* reassurance
* posture
* splinting
* cooling of burns
* occlusive dressings
* control of temperature
* ice packs
* warm pack.

## Chronic pain

* Exclude a new aetiology.
* Ensure pain management plan followed.
* Partial relief may be a more realistic goal.

## General notes

* For IFTs, ensure adequate analgesia has been given prior to commencing transport or request analgesia for transport.
* Consider dose reductions or longer dose intervals in small, elderly and frail patients. Entonox® must be self-administered and maximise ventilation in the space it is administered.
* Dose commercial paracetamol syrup carefully as available in several strengths.

Table 16. Analgesic medication doses – adult

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Medication | Dose | Route | Repeat dose | Maximum dose |
| Paracetamol | 500 mg-1g | oral | 4-6/24 | 4000 mg daily |
| Methoxyflurane | 3 ml | Inhaled | X 1 dose (3ml) | 6 ml daily |
| Entonox | Titrate to pain | Inhaled | as required | NA |

Table 17. Analgesic medication doses – paediatric

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Medication | Dose | Route | Repeat dose | Maximum dose |
| Paracetamol (syrup) | > 1 month 15 mg/kg  (max 1g) | oral | 4-6/24 | 4 g daily |
| Methoxyflurane | 3 ml | inhaled  (self-administer) | X 1 dose | 6 ml daily |
| Entonox | NA | NA | NA | NA |

Graphical user interface, text

Description automatically generatedFigure 27. Pain management

# CPP030: Burns

This CPP refers to the management of acute burns. Where NEPT services are undertaking a transfer of a patient with pre-existing burns receiving management, these goals should be clearly articulated prior to transport with analgesia, wound management and fluid therapy (if any) in place prior to departure.

NEPT services are unlikely to encounter significant acute burn injuries during routine service-delivery, however may encounter presentations in the event of an activation under SHEMP. NEPT services may attend and manage patients with minor (superficial, not large total body surface area) acute burns.

Burn management principles include the following:

* Undertake cooling for at least 20 minutes. (Cool the burn and warm the patient,) Stop cooling the burn if the patient begins shivering or has a temperature < 35C. Consider cooling length that has occurred prior to management by NEPT.
* Cooling should be undertaken with ambient temperature water from a tap. Do not apply ice, iced water or dirty water (water not suitable for drinking).
* If running water is not available, the affected limb or body part may be immersed in water using a spray bottle or applying moist towels.
* Chemical burns should be irrigated and cooled if pain persists. Take care to avoid washing chemicals into eyes or other sensitive areas and to avoid spreading chemicals further on the patient, bystanders or NEPT crew member. This may require very large volumes of water.
* Remove burnt clothing, clothing containing chemicals or hot liquid when safe to do so. Do not attempt to remove clothing that is adhered to underlying tissue.
* Minimise heat loss by applying blankets or thermal blankets and continuing to monitor patient temperature.
* After receiving cooling therapy, apply cling-wrap longitudinally to the affected area to provide a barrier for infection. Applying cling-wrap longitudinally allows for swelling of the affected area.

NEPT crew members should apply particular caution if attending a patient who has been involved in an explosive or flash fire event where there is potential for airway burns. Signs of airway burns include the following:

* Evidence of burns to upper torso, neck, face.
* Facial and upper airway oedema (swelling).
* Sooty sputum.
* Burns that occurred in an enclosed space.
* Singed facial hair.
* Respiratory distress (including audible stridor).
* Hypoxia.

The following burns must have care escalated and require assessment and transport by emergency ambulance:

* All significant burns (partial or full thickness).
* Superficial burns involving more than a localised area of the body.
* Burns that meet major trauma criteria.
* Burns in sensitive areas (genitals, hands, feet, face).

Classification of burns:

* Superficial – involves the epidermal (outer) layer of the skin.
* Partial thickness – can be classified further but involves all of the inner layers of the skin.
* Full thickness – involves a burn that destroys both layers of skin and may penetrate more deeply into underlying structures

Figure 28. Management of burns

Graphical user interface, text, application

Description automatically generated

# CPP031: Fractures or dislocations

The principles of sound fracture and dislocation management in NEPT service delivery revolve around the following points:

* Irrigate and dress open wounds.
* Assess distal neurovascular observations:
* Pulse and capillary refill
* Colour
* Warmth
* Movement
* Sensation
* Pad natural hollows (for example, between thighs), deformities and bony prominences to maintain natural alignment.
* Secure above and below injury sites with correct splint type, for example,
* Traction splint for femoral and upper 2/3 lower leg fracture.
* Anatomical splint for neck of femur (NOF) fractures.
* Constant reassessment of neurovascular observations.
* Adequate analgesia as per CPP028 Pain relief.

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, constitutes a limb threatening injury and is considered time critical.

Where NEPT services attend patients with simple closed fractures, transport is authorised provided the NEPT service can appropriately splint and adequately control pain.

# CPP032: Traumatic head injury

Traumatic head injury in this CPP refers to an injury as a result of physical trauma causing actual or potential damage to the brain and can result from a blunt or penetrating injury mechanism.

Any patient with a GCS reduction of 2 or more than normal GCS should be considered time critical and care escalated.

Patients with a GCS of 13-15 with any of the following factors should be considered as time critical and care must be escalated regardless of NEPT acuity level:

* Any loss of consciousness exceeding 5 minutes.
* Skull fracture (depressed, open or base of skull).
* Vomiting more than once.
* Neurological deficit.
* Seizure at any time associated with head injury.
* Any other concerning neurological symptom following a fall.

In addition to this:

* Any patient that presents with a GCS < 15 following a blunt head injury mechanism should be escalated for advice prior to NEPT commencing transport. NEPT low acuity is not authorised to commence transport in any patient with a GCS that is not normal for the patient.
* Medium-high acuity may be authorised to commence transport with a patient who has a GCS no more than 2 points lower than normal following clinical advice.

NEPT crew members should also consider the following:

* Elderly patients who have had a standing-height fall and are anti-coagulated, on anti-platelet agents or have bleeding disorders should be transported to a neurosurgical capable facility
* Intoxicated patients with a relatively minor mechanism of action may mask critical signs of head injury with intoxication. If assessment is unclear escalate care.

Figure 29. Management of traumatic head injury

Graphical user interface, text, application, email

Description automatically generated

# CPP033: Potential spinal injury

Spinal cord injury (SCI) is a serious condition which often results in severe morbidity and permanent disability. SCI occurs when the axons of nerves running through the spinal cord are disrupted by a traumatic event. This disruption leads to a loss of motor and sensory tone below the level of injury, which is the defining feature of an SCI and may have profound effects on other aspects of the patient’s physiological parameters, including blood pressure.

**NEPT services may be utilised to transport patients with an established SCI for ongoing management.**

**NEPT services may encounter patients with acute SCI following a traumatic injury (penetrating or blunt). If SCI is suspected, the patient should be considered time critical and care must be escalated.**

It is important to highlight that not every traumatic injury involving the spinal region is considered an SCI. The majority of injuries to the spinal region do not involve a loss of motor and sensory tone or, if present, are transient in nature and not associated with permanent disability. For patients without confirmed or suspected SCI but who may have an injury (including vertebral fracture) that may lead to an SCI, the objective is to restrict spinal motion of the patient and apply support including a soft cervical collar.

The use of a screening checklist to determine whether to undertake spinal precautions in the adult population is approved for medium-high acuity NEPT. Where there is doubt about the presence of a spinal injury or in the case of paediatric patients presenting with a relevant mechanism of injury, NEPT crew members should apply a soft cervical collar and spinal motion restriction (SMR) techniques.

**NEPT may be utilised to transport patients with an acute injury/mechanism where SMR is applied but where there is no strong suspicion of associated SCI**

Where a soft collar is indicated, a rigid cervical collar may be used in place of a soft cervical collar until supply of rigid collars is exhausted by NEPT providers.

Prophylactic administration of an anti-emetic (ondansetron) should occur in the case of patients who are managed with spinal motion restriction.

Example mechanisms of injury which may indicate spinal injury include:

* motor vehicle collision
* falls (standing height or greater)
* object falling on patient head
* blast injuries
* sports injuries.

Figure 30. Management of suspected SCI

# Appendix 1: Abbreviations and definitions

Table 18. Abbreviations and definitions

|  |  |
| --- | --- |
| Abbreviation | Description |
| **ACD** | Advance care directive |
| **AED** | Automatic external defibrillator |
| **ARC** | Australian Resuscitation Council |
| **ARV** | Adult Retrieval Victoria |
| **ATA** | Ambulance Transport Attendant |
| **AV** | Ambulance Victoria |
| **AV clinician** | Paramedic working in the Ambulance Victoria communications centre |
| **BGL** | Blood glucose level |
| **BVM** | Bag valve mask |
| **BP** | Blood pressure |
| **bpm** | Beats per minute |
| **CPR** | Cardiopulmonary resuscitation |
| **CPE** | Carbapenem-resistant Enterobacteriaceae |
| **CVC** | Central venous catheter |
| **ECC** | External cardiac compression |
| **ECG** | Electro-cardiograph |
| **EN** | Enrolled nurse (division 2) |
| **ETCO2** | End Tidal CO2 |
| **GCS** | Glasgow Coma Scale |
| **GTN** | Glyceryl trinitrate |
| **Hg** | Mercury |
| **ICC** | Inter-costal catheter |
| **IFT** | Inter-facility transfer |
| **IMI** | Intra-muscular injection |
| **IPPV** | Intermittent Positive Pressure Ventilation |
| **IV** | Intravenous |
| **kg** | Kilograms |
| **L** | Litre |
| **L/min** | Litres per minute |
| **LVF** | Left ventricular failure |
| **m** | Metre |
| **MAP** | Mean arterial pressure (expressed in mmHg) |
| **mg** | Milligrams |
| **min** | Minute |
| **mL** | Millilitre |
| **mm** | Millimetres |
| **MRSA** | Methicillin-resistant staphylococcus aureus |
| **Neb** | Nebuliser mask |
| **NEPT** | Non-emergency patient transport |
| **NEPT  crew member** | Any level of clinical staff member engaged or employed by a NEPT service |
| **NSTEMI** | Non-ST segment elevation myocardial infarction |
| **ODT** | Orally dissolving tablet |
| **PCA** | Patient controlled analgesia |
| **PEA** | Pulseless electrical activity |
| **pMDI** | Pressurised metered dose inhaler |
| **PICC** | Peripherally inserted central catheter |
| **PIPER** | Paediatric Infant Perinatal Emergency Retrieval |
| **PO** | Per oral (delivery of medication) |
| **PRN** | (Pro re nata) When necessary |
| **PCI** | Percutaneous coronary intervention |
| **PTO** | Patient transport officer |
| **RN** | Registered nurse |
| **CCRN (RN CC)** | Registered nurse with critical care qualification and endorsed as such |
| **ROSC** | Return of spontaneous circulation |
| **RR** | Respiratory rate |
| **Secs** | Seconds |
| **SGA** | Supra-glottic airway |
| **SHEMP** | State health emergency management plan (replaced SHERP) |
| **TB** | Tuberculosis |
| **TE** | Trained and endorsed – This implies a requirement for a NEPT crew member to receive specific training by a NEPT licence holder in the skill, medication or procedure as part of credentialling for the applicable NEPT crew member. |
| **VVED** | Victorian Virtual Emergency Department |
| **VF** | Ventricular fibrillation |
| **VRE** | Vancomycin-resistant enterococci |
| **VSS** | Vital signs survey |
| **VT** | Ventricular tachycardia |

# Appendix 2: Withholding or ceasing resuscitation

## Withholding resuscitation

The following are reasons to withhold resuscitation:

### Advance care directive

Advance care directive that states that cardiopulmonary resuscitation be withheld. Refer to Appendix 3: Advance care directive and end-of-life care.

### Obvious death or death verified by a registered medical practitioner, registered nurse or registered paramedic

Resuscitation may be withheld where there is an obvious death or death has been verified by a registered medical practitioner, registered nurse, or registered paramedic. Signs of obvious death include:

* rigor mortis
* postmortem lividity
* putrefaction/decomposition
* injuries incompatible with life.

Injuries incompatible with life are injuries where survival is impossible (for example, decapitation, incineration, cranial and cerebral destruction, hemicorporectomy) and are combined with the absence of signs of life. This is distinct from injuries that are believed to be not survivable due to severity.

## Ceasing resuscitation

Resuscitation may be ceased in circumstances where the scene is unsafe.

Where possible, a registered paramedic or registered nurse or registered medical practitioner should decide when resuscitation efforts are to be ceased. If this support is not available, NEPT crews may consult with either the provider clinician or the AV clinician. Factors that may prompt consultation for cessation of resuscitation include but are not limited to:

* crew exhaustion
* prolonged resuscitation effort (> 45 minutes) with initial rhythm non shockable (no shock advised/asystole).

# Appendix 3: Advance care directives and end-of-life care

No set timeline defines end-of-life care, but due to illness or old age, many people will require responsive care as they approach death. High-quality, end-of-life care relies on open communication, informed decision-making and collaboration among healthcare providers, families and carers, this includes the NEPT sector in Victoria.

## Advance care directive (ACD)

NEPT crew members may provide or withhold treatment based on an advance care directive if the documentation is sighted or accepted in good faith by those present at the scene that the documentation exists.

NEPT crew members must document the details of any decisions made based on the advance care directive in the NEPT patient care record.

### Documentation: Inter-health facility transfers and health facility-to-home transfers

* NEPT crew members transporting a patient from a health facility must request a copy of any advance care directive (or any not for resuscitation request made by the patient) to be provided by the sending health facility before commencing transport.
* The advance care directive must be included in the NEPT patient care record.
* Where a copy is not obtained, the NEPT crew must advise the sending health facility that they will treat the patient according to their clinical practice protocols should it be necessary.

### Documentation: Home-to-health facility transfer

For home-to-health facility transfers, documentation of an advanced care directive may be sighted, or it may be accepted in good faith by those present at the scene that this document exists.

If copies of such documentation are available, they should be included in the NEPT patient care record.

If documentation is not available, the NEPT crew members must

* record full details of the information given to them (where possible, ascertain and differentiate both instructional and values directives)
* record the full details of the person providing the information (where possible advice should be sought from the patient’s medical treatment decision-maker – where they are appointed).

If there is any doubt about the patient’s wishes, the default position is to treat, as appropriate.

### Other

Regardless of time critical criteria (including abnormal vital signs), palliative care patients with a pre-existing terminal illness and not for advanced life support, may still be transported by a NEPT crew, provided the advance care directive is sighted by the NEPT crew members.

If such documentation is not sighted, then NEPT crew members must advise the sending health facility they will treat the patient with usual care should it be necessary and must pay particular attention to whether a patient is suitable for NEPT transport.

If the patient dies in transit (and where a decision has been made and documented not to treat/resuscitate), contact the AV Clinician who will assist with advice on patient care and transport destination.

NEPT crew members other than registered nurse, registered paramedic or medical practitioner, are unable to verify life is extinct.

### Supporting information

The *Medical Treatment Planning and Decisions Act 2016* provides a framework for making medical treatment decisions when people do not have capacity to make their own decisions. Advance care planning allows people to clearly express their values and preferences to inform clinical decision-making when they are unable to directly participate.

#### Advance care directive

An advance care directive allows a person to document their preferences for future medical treatment, should they lose decision-making capacity.

There are two forms of statement a person may include in their advance care directive:

* An instructional directive
* A values directive.

##### Instructional directive

A person may either consent to or refuse a particular medical treatment. If there is a relevant instructional directive, this must be complied with just as if the person has consented to, or refused, the treatment. Refusal of treatment certificates made prior to the commencement of the Act on   
12 March 2018 are to be treated as instructional directives.

##### Values directive

A person may make more general statements about their preferences and values and what matters to them.

#### Medical treatment decision maker

If an adult does not have decision-making capacity, the medical treatment decision maker represents the patient and advocates for them. The medical treatment decision maker is the first willing and available person from the list below (there can only be one medical treatment decision maker at a time):

* An appointed medical treatment decision maker
* A guardian appointed by the Victorian Civil and Administrative Tribunal (VCAT)
* The first of the following with a close and continuing relationship with the person:
  + The spouse or domestic partner
  + The primary carer of the person
  + The first of the following and, if more than one person fits the description in the subparagraph, the oldest of those persons:

an adult child of the person

a parent of the person

an adult sibling of the person.

If a child does not have decision-making capacity, their medical treatment decision maker will be a parent, guardian or other person with parental responsibility. Previous enduring power of attorney and guardianship appointments remain valid under the Act.

#### Voluntary assisted dying

A person cannot request voluntary assisted dying in an advance care directive. People requesting voluntary assisted dying need to have decision-making ability throughout the entire process to make sure their decision remains voluntary and consistent.

# Appendix 4: Mental health patients

## Key message

The objective of the *Mental Health and Wellbeing Act 2022* is to ensure that assessment and treatment of persons with mental illness are provided in the least restrictive way possible. Transport for persons with a mental illness should be arranged in the most timely and least restrictive way possible. This includes travelling in a private vehicle or mental health agency car rather than a stretcher vehicle, if appropriate, and travelling in an NEPT vehicle rather than an emergency ambulance, if appropriate. NEPT services are not authorised to administer sedation for the transport of mental health patients however may transport patients who have received sedation provided they are suitable for NEPT.

### Bodily restraint for safe transport

Under the *Mental Health and Wellbeing Act 2022*, authorised persons are registered paramedics working for Ambulance Victoria, police officers, PSOs, registered medical practitioners employed or engaged by a designated mental health service and authorised mental health practitioners. An authorised mental health practitioner is any of the following who is employed or engaged by a designated mental health service: a registered psychologist; registered nurse; social worker; or registered occupational therapist.

Authorised persons have particular powers under the Act to:

* use bodily restraint on a person in their care and control to enable a person to be safely taken to or from a designated mental health service or any other place. Bodily restraint may only be used if all reasonable and less restrictive options have been tried or considered and have been found to be unsuitable and the restraint is necessary to prevent serious and imminent harm to the person or to another person. The use of bodily restraint must be documented by the person who used the restraint in accordance with their organisation’s records management practices;

#### Searches for safe transport

Authorised persons have particular powers under the Act to:

* search a person in their care and control to enable a person to be safely taken to or from a designated mental health service or any other place. A search may only be conducted if they reasonably suspect that the person is carrying something that presents a danger to the health and safety of any person. Before searching, the authorised person must, to the extent that is reasonable in the circumstances explain the purpose of the search and whether the person will be required to remove clothing during the search and if so why it is necessary. The authorised person must seek the person's cooperation and conduct the search—

1. in a way that provides reasonable privacy for the person searched; and
2. as quickly as is reasonably practicable; and
3. if the person being searched is of or under the age of 16 years, in the presence of—
   1. a parent of the person; or
   2. a carer or supporter of the person; or
   3. if it is not reasonably practicable for a parent, carer or supporter to be present, another adult.

The authorised person must conduct the least invasive kind of search practicable in the circumstances. So far as is reasonably practicable in the circumstances, a search that involves running the hands over the person's outer clothing must be conducted by—

* 1. an authorised person of the gender nominated by the person to be searched; or
  2. an authorised person nominated by the person; or
  3. a person of the gender nominated by the person to be searched under the direction of an authorised person; or
  4. a person nominated by the person to be searched under the direction of an authorised person.

Seize and secure an item found as a result of a search if reasonably satisfied that the thing represents a danger to the health and safety of any person. The authorised person must make a written record of the thing seized, the date and name of the person from whom it was seized and securely store it. However, the thing seized must be given to a police officer as soon as practicable when it is a

* 1. controlled weapon, dangerous article or prohibited weapon within the meaning of the Control of Weapons Act 1990; or
  2. drug of dependence within the meaning of the Drugs, Poisons and Controlled Substances Act 1981 or a substance, material, document or equipment used for the purpose of trafficking in a drug of dependence within the meaning of that Act; or
  3. firearm within the meaning of the Firearms Act 1996; or
  4. the authorised person reasonably believes the thing would present a danger to the health and safety of the person or another person if the thing were returned to the person.

The authorised person must take reasonable steps to return the thing seized to the person from whom it was seized when the reason for the seizure of the thing no longer applies (unless it has been required to be given to a police officer).

#### Sedation for safe transport

Under the *Mental Health and Wellbeing Act 2022*, sedation is described as a form of chemical restraint. A registered medical practitioner (who may not necessarily be an authorised person) can administer sedation to enable a person to be safely taken to or from a designated mental health service or any other place if all reasonable and less restrictive options have been tried or considered and found to be unsuitable and if the sedation is necessary to prevent serious and imminent harm to the person or to another person. The registered medical practitioner may direct a registered nurse (who may not necessarily be an authorised person) or registered paramedic employed by AV to administer the sedation.

The use of sedation must be documented by both the person prescribing and the person administering the sedation in accordance with their organisation’s records management practices.

# Appendix 5: ‘Double-loading’ (low acuity only)

The regulations stipulate that only patients classified as low acuity are able to be ‘double-loaded’   
(2 patients requiring clinical transport in a single vehicle). Low acuity patients are those that do not require active management or invasive or continuous monitoring with no deterioration forecast and have been assessed as likely to be haemodynamically stable for the duration of the transport.

The following patient conditions or situations prevent double-loading even if the patient would be considered otherwise low acuity:

* If a patient is behaving in a way that may distress or endanger the other patient.
* If a patient is immune-supressed.
* If a patient has a condition that is likely to cause offence or distress to the other patient.
* If a patient is at high risk of dying during transport (for example, palliative patient).
* If a patient has or is suspected of having an infectious disease that has a high risk of being transmitted to the other patient.
* If a patient reasonably requires privacy due to the patient’s medical condition.
* If a patient requires the use of therapeutic or monitoring devices that would prevent or inhibit ready access to the patient.

The regulations stipulate that a suitably qualified NEPT crew member remain with the patient during the course of the transport and not be left unattended in the patient compartment.

* Transport is taken as the time of receiving handover of the patient at a sending facility or location until handover is provided at the receiving facility or destination.

Generally, NEPT patients are not to be taken through multiple areas of a health facility or destination to facilitate supervision of a patient. Some instances may arise where 2 patients have a final destination located within the same facility where this may be appropriate, however:

* these places should not be geographically significantly dispersed, or
* these places should not be likely to cause distress or uncertainty for the patient who is not immediately going to their final destination.

Prior to authorising and commencing a double-load transport, NEPT crew members and providers are also encouraged to take note of any relevant occupational health and safety (OH&S) legislation or considerations or manufacturer’s instructions regarding minimum operator levels or instructions relating to the use of stretchers when planning double-loaded transports.

# Appendix 6: Minimum equipment list

The regulations prescribe that a licence holder operating a NEPT vehicle used to transport patients must have all the equipment and supplies necessary to meet the patient’s clinical needs for the duration of the transport. The regulations specify that this includes (but is not limited to) an AED, oxygen, suction and a BVM. The NEPT licence holder has a responsibility to ensure that the equipment is present and is responsible for maintenance and calibration of equipment as outlined in manufacturer’s instructions.

Table 19 assists NEPT providers to ensure that the requisite equipment is located on NEPT vehicles relative to the acuity level serviced. This list does not prescribe the number of each item or quantity of consumables however this must be sufficient based on likely operational need. Any equipment which is required by contractual arrangement or which NEPT licence holders have identified as being necessary may be carried in addition to this list.

Table 19. Minimum equipment list

|  |  |  |
| --- | --- | --- |
| Low acuity | Medium acuity – all of low acuity plus: | High acuity – all of medium acuity plus: |
| AED  BVM- adult and paediatric including different size face masks  Arterial tourniquet(s)  Shears  Pulse Oximetry  Thermometer  Sphygmomanometer (manual or auto) with cuffs for small adult/paediatric, 'normal', bariatric  Oxygen (portable and in vehicle)  Linen  Hudson O2 mask - paediatric + adult  Nasal cannula O2  Infectious disease PPE (gloves, gown, glasses, surgical mask, P2 mask)  Suction (in vehicle) with yankauer sucker  Emesis bag(s)  Infection waste bags  Vehicle cleaning equipment (wipes, spray)  Spill kit as applicable in vehicle cleaning plan  GPS and/or mounting suitable for securing mobile phone  Soft C-collars  Sharps container  **First aid kit - minimum contents below**   * Gauze * Combine dressings * Arterial Tourniquet - CAT * Roller Bandages * triangular bandages * Saline (Sodium chloride)   Lifting cushion  Glucometer  Copy of Clinical Practice Protocols (electronic or printed)  Alcohol swabs/wipes  Oropharyngeal airway  Manual handling equipment as appropriate (for example, slide sheet)  Bed pan  Equipment likely to be required as part of SHEMP activation e.g high visibility safety vests, helmets etc  **Medicines approved for PTO level**   * Adrenaline delivery device (auto-injector) * Aspirin * Paracetamol * Salbutamol PMDI * Glucose paste | Cardiac monitor (3/5 lead minimum)  ECG dots  Manual defibrillator with spare pads - paediatric and adult  Suction catheter including 'Y' suction catheter 6fr-14fr  SGA/LMA  NRB mask - paediatric and adult  NEB mask - paediatric and adult  Suction - portable  Pelvic binder  Formable splint  Stethoscope  1ml syringe with IM needles  **Medicines approved for ATA level**   * Inhaled analgesia S4 - Methoxyflurane and/or Entonox * Glyceryl trinitrate * Glucagon * Adrenaline 1:1000 and/or autoinjector device * Ondansetron (wafers) * Ipratropium bromide poly-ampoule * Salbutamol poly-ampoule | 12 lead capable ECG  Syringe driver(s)  Arterial pressure bag  Arterial forceps  IV pole and attachment point  Arterial line transducer set and cable/s  ETCO2 filter line (adult)  PEEP valve(s)  Consumables for IVC and administration of medicines/infusions (for example, giving sets)  50 ml syringe(s) for infusions  20 ml syringe(s)  10 ml syringe(s)  Normal saline IV bags  **Medicines approved for high acuity level (CCRN)\***   * Metaraminol * Atropine * Amiodarone * Adrenaline 1:1000 or 1:10000 * Ondansetron (ampoule for IV/IM administration) * D10W * D5W (infusion dilutant)   \*High acuity services may choose to not stock the complete list of medicines depending on anticipated service demand, for example a high acuity service working within metropolitan Melbourne with ready access to emergency ambulance escalation may not have the same requirements as a rural or air high acuity transfer service. A clinical risk assessment should be undertaken by the licence holder when determining medication stock holding levels. |

# Appendix 7: Prolonged transport

NEPT services may provide patient care episodes of a prolonged nature. This is often due to transport destinations, extended off-load times and caring for patients across multiple episodes of care, for example, multiple IFT transports.

It is essential when looking after patients for a prolonged period of time, in addition to routine monitoring and management of the patient (for example, vital signs survey, pain management) that the longer-term needs of the patient are considered. These include:

* hydration, for example, oral fluids
* last meal or likely timeframe before next meal
* toileting needs
* repositioning
* patient’s own regular medication.

It is acceptable to delay transport of a patient to facilitate their long-term needs. For example, delay loading and transport of a patient to enable a meal to be eaten, pulling over regularly to facilitate toileting.

Where appropriate, NEPT crews should request information relating to the long-term needs of the patient when receiving a handover, including any modification to needs, for example, soft diet. This information should be documented on the patient care record.

## Pressure injuries

Pressure injuries can happen to older patients or patients of any age who have one or more of the following risk factors: immobility, lack of sensory perception, poor nutrition or hydration, excess moisture or dryness, poor skin integrity, reduced blood flow, limited alertness, or muscle spasms. Even short duration of stasis may cause or contribute to a pressure injury. Repositioning of a patient must occur at a minimum of every 2 hours. Any documentation relating to an existing pressure injury or screening for pressure injury should be documented on the patient care record.

# Appendix 8: Medication pharmacology reference material

Always check if the patient has had the medication within the last 24 hours and administer accordingly.

These pages contain information about the medications only. Refer to the relevant CPP for dosing guides.

For further information on the medications, refer to a published pharmaceutical reference guide, for example:

1. MIMS Annual with MIMS Abbreviated, e-MIMS, MIMS Online
2. Standardised inotrope and vasopressor guidelines, Safer Care Victoria
3. AusDI Advanced / AusDI.
4. Australian Medicines Handbook (AMH)
5. AMH Children’s Dosing Companion
6. Australian Don’t Rush to Crush Handbook
7. Australian Immunisation Handbook
8. Australian Pharmaceutical Formulary and Handbook (APF)
9. Therapeutic Guidelines series
10. Merck Manual (Professional Version) (Merck Sharp and Dohme).
11. Drug interactions via the following additional references:
    * + - Drug Interaction Facts – Facts and Comparisons
        - Micromedex
        - Stockley’s Drug Interactions Online, or
        - Lexicomp Interactions
12. Evidence-based reference work on complementary and alternative medicines via:
    * + - Herbs and Natural Supplements: An evidence-based guide. Braun and Cohen
        - Herbal Medicines. Barnes, Anderson and Phillipson
        - Herbal Medicines and Dietary Supplements package (each resource can be independently accessed through Medicines Complete)
        - MedlinePlus: Drugs, Supplements, and Herbal Information (available free online)
        - Natural & Alternative Treatments: EBSCO, or Natural Medicines (formerly Natural Standard and Natural Medicines *Comprehensive Database*).

## Adrenaline

|  |  |
| --- | --- |
| Presentations | * 1 mg adrenaline (1 ml of 1:1000 = 1 mg/ml) glass vial * 1mg adrenaline (10ml of 1:10,000 = 100microg/ml) glass vial * EpiPen ® (300 microgram) autoinjector is recommended for adults and children over 20 kg (aged around 5 years or over) * EpiPen Jr ® (150 microgram) autoinjector is recommended for children 7.5 to 20 kg (aged around 1 to 5 years) * Anapen 500 ® (500 microgram) autoinjector is recommended for adults and children over 50 kg (aged around 12 or over) * Anapen 300 ® (300 microgram) autoinjector is recommended for adults and children over 20 kg (aged around 5 years or over) * Anapen Jr ® (150 microgram) autoinjector is recommended for children 7.5 to 20 kg (aged around 1 to 5 years) |
| Primary emergency indications | * Cardiac arrest - VF/VT, Asystole or PEA * Cardiogenic shock * Anaphylaxis * Critical asthma * Stridor due to inflammation |
| Contraindications  (Known hypersensitivity plus) | * Contraindications are relative as this product is intended for use in life threatening emergencies * Hypovolaemic shock without adequate fluid replacement |
| Precautions | * Consider reduced doses for:   Elderly / frail patients  Patients with cardiovascular disease  Patients on monoamine oxidase inhibitors  Higher doses may be required for patients on beta blockers |
| Key timings | * IM effects: **Onset**: 30 – 90 seconds, **Peak:** 4 – 10 minutes, **Duration:** 5 – 10 minutes * IV effects: **Onset**:30 seconds, **Peak:** 3 – 5 minutes, **Duration:** 5 – 10 minutes |
| Special notes and important interactions | * All patients receiving adrenaline for possible anaphylaxis are to be transported to a health service provider for ongoing care * The ideal location for IM injection is the mid-outer thigh. Other suitable sites include the midline upper arm (deltoid) * IM adrenaline has a short duration and patients must be closely monitored for reoccurrence of symptoms * There is an increased the risk of hypotension and tachycardia with patients taking α-blockers * Severe hypertension and bradycardia may occur with patients taking nonselective β-blocking drugs |
| Side effects | * Tachycardia * Arrhythmias * Hypertension * Dilated pupils * Feeling of anxiety/palpitations   Note: May increase size of myocardial infarction |
| Pharmacology or actions | * A naturally occurring alpha and beta-adrenergic stimulant * Increases heart rate by increasing SA node firing rate (Beta 1) and conduction velocity through the A-V node (Beta 1) * Increases myocardial contractility (Beta 1) * Increases the irritability of the ventricles (Beta 1) * Causes bronchodilatation (Beta 2) * Causes peripheral vasoconstriction (Alpha) |

## Amiodarone

|  |  |
| --- | --- |
| Presentations | * 150 mg in 3mL vials / glass ampoules |
| Primary emergency indication(s) | * Ventricular fibrillation * Pulseless ventricular tachycardia refractory to defibrillation * Sustained or recurrent ventricular tachycardia |
| Contraindications (Known hypersensitivity plus) | Contraindications are relative as this product is intended for use in cardiac emergencies  VT – Pregnancy  Do not administer Amiodarone if VT follows Ondansetron administration  TCA OD |
| Precautions | Nil of significance in the above indications |
| Key timings | * IV effects (bolus): **Onset:** 2 minutes, **Peak:** 20 minutes, **Duration:** 2 hours |
| Special notes / (and important interactions) | * Amiodarone is only to be administered by trained and endorsed staff. * Amiodarone is incompatible with normal saline. * Glucose 5% must be used as diluent when preparing an IV infusion. * An IV infusion of amiodarone may be required during interhospital transfer. This will be prescribed by the referring medical practitioner and will normally be at a dose of 10 -20 mg/kg run over 24 hours. * An infusion for acute WCT is different and is 0.05mg/kg up to 300mg run over 20 minutes. * Interactions:   + Some antiarrhythmic agents   + Cyclosporin   + Phenytoin   + Warfarin and other anticoagulant agents |
| Side effects | * Hypotension * Bradycardia |
| Pharmacology / Actions | * Class III anti-arrhythmic agent |

## Aspirin

|  |  |
| --- | --- |
| Presentations | * 300mg chewable tablets * 300 mg soluble or water dispersible tablets |
| Primary emergency indication(s) | * Chest pain/discomfort * Acute Coronary Syndrome (ACS) |
| Contraindications (Known hypersensitivity plus) | Haemophilia or other bleeding disorders  Erosive actively bleeding gastritis or peptic ulcer  Hypersensitivity to other salicylates  Suspected dissecting aortic aneurysm  Chest pain associated with psychostimulant overdose if SBP >160 mmHg  Acute febrile illness in children and adolescents  Severe hepatic or renal disease |
| Precautions | Active peptic ulcer  Asthma  Patients on anticoagulants |
| Key timings | * **Onset:** for emergency indication n/a, **Peak:** n/a, **Duration:** 8 - 10 days |
| Special notes / (and important interactions) | * Aspirin is **not** to be administered by NEPT for any condition **other than** chest pain/discomfort of a cardiac nature * The anti-platelet effects of Aspirin persist for the natural life of platelets |
| Side effects | * Heartburn, nausea, gastrointestinal bleeding * Increased bleeding time * Hypersensitivity reactions |
| Pharmacology / Actions | * An analgesic, antipyretic, anti-inflammatory and antiplatelet aggregation agent * Actions:   + To minimise platelet aggregation and thrombus formation to retard the progression of coronary artery thrombosis in ACS   + Inhibits synthesis of prostaglandins - anti-inflammatory actions |

## Atropine

|  |  |
| --- | --- |
| Presentations | * 0.6 ml in 1ml polyamp * 1.2 mg in 1 ml polyamp |
| Primary emergency indication(s) | * Unstable bradycardia |
| Contraindications (Known hypersensitivity plus) | Previous heart transplant |
| Precautions | Atrial flutter  Atrial Fibrillation  Myocardial infarction  Glaucoma |
| Key timings | * **Onset:** < 2 min, **Peak:** < 5 min, **Duration:** 2-6 hours |
| Special notes / (and important interactions) | * Do not increase HR > 100 * If administering adrenaline after atropine ensure line/cannula is flushed with at least 10 ml of Normal Saline/D5W * No severe interactions |
| Side effects | * Palpitations * Tachycardia * Dry mouth * Dilated pupils * Visual blurring * Retention of urine * Confusion/restlessness (in large doses) |
| Pharmacology / Actions | * Inhibition of acetycholine on post-ganglionic cholinergic nerve potentiating sympathetic effect to increase HR by increasing SA node rate and increasing conduction velocity through A-V node |

## Glucagon

|  |  |
| --- | --- |
| Presentations | * Vial with 1mg of powder for reconstitution prior to injection (and if in kit, 1 pre-filled syringe with 1 mL sterile water for reconstitution) |
| Primary emergency indication(s) | * Diabetic hypoglycaemia (BGL < 4 mmol/L) in patients with an altered conscious state who are unable to self-administer oral glucose, or is unavailable * Anaphylaxis (adult) where patients remain hypotensive following adrenaline therapy with history of heart failure or patients taking beta-blocker medication |
| Contraindications (Known hypersensitivity plus) | Nil of significance in the above indication |
| Precautions | Nil of significance in the above indication |
| Key timings | * **Onset:** 3-5 minutes, **Duration:** 12-25 minutes |
| Special notes / (and important interactions) | * Patients taking beta-blockers might be expected to have a greater increase in both pulse and blood pressure * Not all patients will respond to glucagon (e.g., those with inadequate glycogen stores in the liver (alcoholics, malnourished)) * It is important to ensure early transport/activation of paramedic back-up in all cases of hypoglycaemia |
| Side effects | * Nil significant * Nausea and vomiting (rare) |
| Pharmacology / Actions | * A hormone normally secreted by the pancreas which raises blood glucose level * Actions:   + Causes an increase in blood glucose concentration by converting stored liver glycogen to glucose |

## Glucose paste

|  |  |
| --- | --- |
| Presentations | * Oral Glucose Gel 37.5 g containing 15 grams of glucose |
| Primary emergency indication(s) | * Diabetic hypoglycaemia (low blood sugar) with altered RBG < 4 mmol/L and conscious and able to cooperate. |
| Contraindications (Known hypersensitivity plus) | Inability to swallow due to altered conscious state |
| Precautions | Nil of significance for the above indication |
| Key timings | * If no response within 15 minutes, repeat dosage |
| Special notes / (and important interactions) | * Not all patients will respond to glucose paste and it is important to ensure early escalation of care / transport * Not recommended for children under 2 years of age |
| Side effects | * Nil significant |
| Pharmacology / Actions | * Oral glucose gel |

## Glyceryl Trinitrate (GTN)

|  |  |
| --- | --- |
| Presentations | * 0.6mg tablets Anginine ® and Lycinate ® tablets * 0.3mg and (0.6mg Nitrostat ® tablets (Nitrostat tablets cannot be split.) * 0.4mg Nitrolingual spray |
| Primary emergency indication(s) | * Cardiac chest pain/discomfort * Hypertension associated with acute cardiogenic pulmonary oedema * Hypertension associated with acute coronary syndrome |
| Contraindications (Known hypersensitivity plus) | Haemorrhage or head trauma  Known hypersensitivity  Systolic blood pressure < 100 mmHg  Heart rate > 150 beats per min or < 50 beats per min  Sildenafil and/or vardenafil use in the previous 24 hours or tadalafil use in the previous 48 hours  Note: Tadalafil (Cialis) may also be prescribed to men for treatment of benign prostatic hypertrophy  Ventricular tachycardia |
| Precautions | No previous administration of GTN  Elderly or frail patients  Recent Myocardial Infarction  Concurrent use with other tocolytics |
| Key timings | * Sublingual/buccal effects: All tablets are absorbed via buccal mucosa via sublingual administration   + **Onset:** 30 sec–2 minutes, **Peak:** 3–5 minutes, **Duration:** 15–30 minutes |
| Special notes / (and important interactions) | * GTN tablets are susceptible to heat and moisture. Tablets must be stored tightly sealed in their original container. * Avoid administering patient’s own medication as it may not have been stored in optimal conditions * Nitrostat tablets **cannot** be split. Anginine and Lycinate may be split. |
| Side effects | * Hypotension * Tachycardia * Headache * Nausea and vomiting * Syncope * Dizziness * Skin flushing of face and neck (uncommon) * Bradycardia (occasionally) |
| Pharmacology / Actions | * Nitrate- a vascular smooth muscle relaxant and vasodilator * Actions:   + Venous dilatation promotes venous pooling and reduces venous return to the heart (reduces preload)   + Arterial dilatation reduces systemic vascular resistance and arterial pressure (reduces afterload) * The effects of the above are:   + Reduced myocardial oxygen demand   + Reduced systolic, diastolic, and mean arterial blood pressure, whilst usually maintaining coronary perfusion pressure   + Mild collateral coronary arterial dilatation may improve blood supply to ischaemic areas of myocardium   + Mild tachycardia secondary to slight fall in blood pressure |

## Nitrous Oxide (Entonox®)

|  |  |
| --- | --- |
| Presentations | * Cylinder of gas (blue or blue top) * 50% nitrous oxide/50% Oxygen delivered via face mask |
| Primary emergency indication(s) | * Inhaled analgesia for moderate-severe pain |
| Contraindications (Known hypersensitivity plus) | Do not administer in any condition where gas is entrapped within a body (for example pneumothorax, air embolism, decompression sickness, recent diving, gross abdominal distension, laproscopy, severe bullous emphysema, patients having received recent intraocular injection of gas) |
| Precautions | Use in combination with other analgesia/sedatives will potentiate effects  Entonox® should be self-administered by the patient holding the face mask |
| Key timings | * **Onset:** 2-5 minutes, **Peak:** N/A, **Duration:** 3-5 min after inhalation ceases |
| Special notes / (and important interactions) | * Comply with manufacturer requirements for safe storage of cylinder * The use of higher levels of oxygen can increase the risk of pulmonary toxicity in patients who have been administered Bleomycin. In these cases Entonox® should be administered with caution and at levels kept as low as possible (with a preference to choose Methoxyflurane ahead of Nitrous Oxide) |
| Side effects | * Euphoria * Sedation * Nausea and vomiting * Dizziness   Side effects are transient in nature and will generally rapidly resolve post-administration |
| Pharmacology / Actions | * Colourless non-flammable gas that has an analgesic effect by releasing endogenous opioids that act on opioid receptors. |

## Ipratropium Bromide

|  |  |
| --- | --- |
| Presentations | * Metered inhaler pump: 21 microgram per metered dose inhalation aerosol (as bromide monohydrate) ATROVENT ® * Inhalation ampoule: Single dose units of 0.25 mg in 1ml, (as monohydrate) AERON ® ATROVENT ® * Inhalation ampoule: Single dose units of 0.5mg in 1ml, (as monohydrate) AERON ® ATROVENT ® |
| Primary emergency indication(s) | * For maintenance treatment of bronchospasm associated with asthma and chronic pulmonary disease * Severe respiratory distress associated with bronchospasm * Exacerbation of COPD irrespective of severity |
| Contraindications (Known hypersensitivity plus) | Known hypersensitivity to atropine or its derivatives |
| Precautions | Paradoxical bronchospasm  Avoid contact with the eyes.  Glaucoma |
| Key timings | * **Onset:** 3 - 5 minutes, **Peak:** 1.5 - 2 hours, **Duration:** 6 hours |
| Special notes / (and important interactions) | * Ipratropium bromide must be nebulised with salbutamol in NEPT * To be administered as a single dose only * Avoid contact with the eyes. * The nebuliser mask must be fitted properly during inhalation and care taken to avoid **Ipratropium Bromide** solution entering  the eyes.   + There have been isolated reports of ocular complications (dilated pupils, increased intraocular pressure, acute angle glaucoma, and eye pain) because of direct eye contact of nebulised mist |
| Side effects | * Headache * Nausea * Dry mouth * Throat irritation / Cough * Skin rash * Gastrointestinal disorders (including constipation, diarrhoea, gastrointestinal motility disorder, and vomiting) * Dizziness * Tachycardia (rare) * Palpitations (rare) * Acute angle closure glaucoma secondary to direct eye contact (rare) |
| Pharmacology / Actions | * Anticholinergic bronchodilator * Actions: Allows bronchodilatation by inhibiting cholinergic bronchomotor tone (i.e., blocks vagal reflexes which mediate bronchoconstriction) |

## Methoxyflurane

|  |  |
| --- | --- |
| Presentations | * 1.5mL or 3mL bottle each bottle contains 99.9% methoxyflurane  Penthrox ® kit contains, bottle, inhaler, and (model dependant) sometimes a charcoal exhaust filter |
| Primary emergency indication(s) | * For relief of moderate-severe pain by self-administration |
| Contraindications (Known hypersensitivity plus) | Renal impairment/failure  Head injury or loss of consciousness  Personal or family history of malignant hyperthermia  Exceeding total dose of 6 mL in a 24-hour period |
| Precautions | The 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  Pre-eclampsia  Concurrent use with Oxytocin may cause hypotension |
| Key timings | * Analgesia commences after 8 - 10 breaths and lasts for approximately 3 - 5 minutes once discontinued |
| Special notes / (and important interactions) | * Maximum 6 mL can be given within 24-hours * If stronger analgesia is required, patient can cover dilutor hole with finger during inhalation * Continuous administration reduces time of analgesia * The maximum initial priming dose 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 * Do not administer in a confined space. Ensure adequate ventilation in vehicle * Malignant hyperthermia is a very rare condition that can be induced by volatile anaesthetics such as methoxyflurane. Ask patients about any history or family history of adverse reactions to inhaled anaesthetics * In patients with muscular dystrophy, volatile agents may precipitate life-threatening rhabdomyolysis |
| Side effects | * Dizziness * Headache * Amnesia - retrograde * Nausea and Vomiting * Cough * Fever * Decrease in blood pressure and bradycardia (rare) |
| Pharmacology / Actions | * Belongs to the fluorinated hydrocarbon group of volatile anaesthetic agents   + Short acting |

|  |  |
| --- | --- |
| Presentations | * 10mg/1ml * Dilute 10mg (1 ml) with 19ml of Normal Saline in 20 ml syringe. This leaves preparation of 0.5mg/ml |
| Primary emergency indication(s) | * Undifferentiated Shock |
| Contraindications (Known hypersensitivity plus) | Sulphite hypersensitivity  MAOI overdose  TCA overdose |
| Precautions | Shock due to hypovolaemia |
| Key timings | * **Onset:** 1-2 minutes, **Duration:** 20-60 minutes |
| Special notes / (and important interactions) | * Continuous cardiac monitoring required * Suitable for all cannula sizes * Monitor the access site every time patient observations are recorded |
| Side effects | * Headache * Tachycardia, reflect bradycardia, arrhythmia * Local soft tissue necrosis |
| Pharmacology / Actions | * Synthetic sympathomimetic amine primarily an α1 adrenergic agonist (peripheral vasoconstriction) * Secondary (lesser) effect of β1 adrenergic agonist (positive inotrope) |

## Metaraminol

## Ondansetron

|  |  |
| --- | --- |
| Presentations | * Wafer or tablet - 4mg and 8mg * 8 mg in 4 mL glass ampoule |
| Primary emergency indication(s) | * All undifferentiated nausea and vomiting |
| Contraindications  (Known hypersensitivity plus) | Concurrent Apomorphine use |
| Precautions | Can increase large bowel transit time  Patients with liver disease should not receive more than 8 mg of Ondansetron per day  Care should be taken with patients on diuretics who may have an underlying electrolyte imbalance  Ondansetron contains aspartame and should not be given to patients with phenylketonuria  Concurrent use of Tramadol  Pregnancy  Known Long Q-T syndrome  Hypokalaemia or hypomagnesaemia |
| Key timings | * **Oral (ODT) Wafers**   + **Onset:** 2 minutes, **Peak:** 20 minutes, **Duration:** 120 minutes * **IV**   + **Onset:** 5 minutes, **Peak:** 10 minutes, **Duration:** between 2.5 and 6.1 hours |
| Special notes / (and important interactions) | * Ondansetron may not be effective for all types of nausea and vomiting * IV doses should be delivered as a slow push (minimum 30 seconds) |
| Side effects | * Headache * Constipation * Fever * Prolonged QTc |
| Pharmacology / Actions | * Anti-emetic primarily a 5HT antagonist which blocks receptors both centrally and peripherally |

## Paracetamol

|  |  |
| --- | --- |
| Presentations | * 500mg tablets or capsules * 120 mg in 5 mL oral liquid (24 mg/mL) |
| Primary emergency indication(s) | * Mild pain relief including headache |
| Contraindications (Known hypersensitivity plus) | Children < 1 month of age  Paracetamol already administered within past 4 hours  Total paracetamol intake within past 24 hours exceeding 4 g (adults) or 60 mg/kg (children) |
| Precautions | Overdose may cause liver failure  Liver impairment  Hepatic dysfunction/failure  Renal impairment  Elderly / frail  Malnourished |
| Key timings | * **Onset:** 30 minutes, **Peak:** N/A, **Duration:** 4 hours |
| Special notes / (and important interactions) | * Paracetamol is not indicated for the treatment of fever in the emergency setting * 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 * Hepatic damage is very rare when Paracetamol is taken at recommended dosages |
| Side effects | * Hypersensitivity reactions including severe skin rashes (rare) * Haematological reactions (rare) |
| Pharmacology / Actions | * Analgesia and antipyretic agent |

## Salbutamol

|  |  |
| --- | --- |
| Presentations | * Inhalation ampoule: Single dose units of 5 mg in 2.5 mL nebules / polyamps. * Inhalation ampoule: Single dose units of 2.5 mg in 2.5 mL nebules / polyamps. * Pressurised Metered Dose Inhaler (pMDI) with 0.1 mg per actuation/dose. |
| Primary emergency indication(s) | * Respiratory distress with suspected bronchospasm:   + asthma   + Anaphylaxis   + COPD   + Other causes of bronchospasm |
| Contraindications (Known hypersensitivity plus) | Nil of significance in the above indications. |
| Precautions | Large doses of Salbutamol have been reported to cause intracellular metabolic acidosis. |
| Key timings | * Inhaled effects: **Onset:** 5 – 15 minutes, **Peak:** n/a, **Duration:** 15 – 50 minutes. |
| Special notes / (and important interactions) | * Interaction: Beta-adrenergic blocking drugs inhibit the bronchodilator action of salbutamol and other sympathomimetic bronchodilators. * 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. * Nebules should be stored at an ambient temperature < 30 degrees Celsius. * The effectiveness of salbutamol differs between patients, it is important to escalate care early * Continue to administer oxygen 8 L/min between doses. |
| Side effects | * Tachycardia * Palpitations * Muscle tremor |
| Pharmacology / Actions | * Bronchodilator * A synthetic beta-adrenergic stimulant with primarily beta 2 effects. |