

Ambulance Tasmania

Clinical Practice Guidelines  
for Paramedics & Intensive Care Paramedics





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### **Clinical Practice Guidelines**

for Paramedics and Intensive Care Paramedics

February 2012

Revised August 2012

Ambulance Tasmania

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# Foreword

The Ambulance Tasmania Clinical Practice Guidelines (CPG) for Paramedics and Intensive Care Paramedics have undergone a major revision to ensure contemporary, evidence-based practice in an easy to read format. This revised format incorporates a flow chart style, colour coding for individual management steps, and distinct separation of Paramedic and Intensive Care Paramedic interventions. It was developed by the Ambulance Victoria (AV) CPG Working Group with specialist advice from the AV Corporate Communications Department, and provided to Ambulance Tasmania (AT) for conceptualisation to AT practice. The design provides greater clarity within each guideline to assist clinical practice. The reformat highlights key details and decision pathways within each Guideline and is intended to reduce risk in Paramedic practice through an improved clarity of the CPGs.

There is a new “language” associated with these Guidelines that is illustrated in the Abbreviations / Colour Chart. It is based on contemporary designs in industry that highlight key information with colour-cognitive triggering, the intention being to remind the user of important details within the Guideline. For example, a red colour is to highlight an aspect of the Guideline that may place the patient at risk or requires an immediate intervention prior to proceeding.

These Guidelines have been recommended by the Tasmanian Ambulance Clinical Council (TACC) and approved by the Chief Executive Officer for use by Paramedics and Intensive Care Paramedics when working for AT. The Guidelines represent a multi disciplinary consensus based on the best available evidence on the management of common emergency medical problems encountered by Paramedics and Intensive Care Paramedics which they are expected to follow under normal circumstances. It is recognised that alternative methods of treatment exist, and that from time-to-time circumstances may arise where the management of a particular patient in a life-threatening situation may require the guidelines to be varied in some aspect. Such variations should only be made after appropriate medical consultation and will be subject to clinical review as part of Ambulance Tasmania’s Clinical Governance processes.

Each CPG clearly outlines the respective practice levels for AT Paramedic and Intensive Care Paramedics. It is important to note that not all Paramedics and Intensive Care Paramedics are credentialed to practise independently at the levels defined within these Guidelines. Staff are responsible for ensuring they only operate within their individually approved scope of practice and should contact the Clinical Services Division for clarification regarding practice approvals if required.

AT would like to acknowledge the support from Ambulance Victoria in developing these guidelines. In addition, it is important to note the exceptional work done by AT staff to conceptualise the document and guidelines to Tasmanian needs. Every effort has been made to ensure the accuracy of these CPGs. They are under constant review in light of changes to evidence based practice. Feedback is welcome as these Guidelines are an evolving product and can be forwarded to [cpgfeedback@dhhs.tas.gov.au](mailto:cpgfeedback@dhhs.tas.gov.au) Proposals for change to the CPGs can be accessed via the New Interventions Policy and will be forwarded to the relevant committee.

# Acknowledgements

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Adenosine	2.4	CPG D002
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Water for Injection		CPG:D034

# Guide to Abbreviations

@	'At' relating to time intervals between dose/action/intervention	CPAP	Continuous Positive Airway Pressure	IN	Intranasal
AAA	Abdominal Aortic Aneurysm	CPG	Clinical Practice Guideline	I/O	Intraosseous
ACS	Acute Coronary Syndrome	D5W	5% Dextrose	IPPV	Intermittent Positive Pressure Ventilation
ADLs	Activities of Daily Living	DCCS	Direct Current Counter Shock	IU	International Unit
AF	Atrial Fibrillation	DCR	Direct Current Reversion	IV	Intravenous
AIVR	Accelerated Idioventricular Rhythm	DKA	Diabetic Ketoacidosis	J	Joules
AMI	Acute Myocardial Infarction	dpm	Drops per minute	kg	kilograms
AP	Ambulance Paramedic	ECC	External Cardiac Compression	LMA	Laryngeal Mask Airway
APH	Antepartum haemorrhage	ECG	Electrocardiogram	Lpm	litres per minute
APO	Acute Pulmonary Oedema	EtCO <sub>2</sub>	End-tidal carbon dioxide	LVF	Left Ventricular Failure
A-V	Atrioventricular	ETT	Endotracheal tube	max.	maximum
AVRT	Atrioventricular re-entry tachycardia	FG	French Gauge	MVA	Motor Vehicle Accident
AVNRT	A-V nodal re-entry tachycardia	FHR	Foetal Heart Rate	mcg	microgram/s
BGL	Blood Glucose Level	g	gram/s	mg	milligram/s
BLS	Basic Life Support	GCS	Glasgow Coma Score	min	minutes
BP	Blood Pressure	GIT	Gastrointestinal Tract	ml	millilitres
bpm	beats per minute	GR	Grade	ml/hr	millilitres per hour
BVM	Bag-Valve-Mask	GTN	Glyceryl trinitrate	mmHg	millimetres of Mercury (Hg)
C/I	Contraindication	hr	hour	mmol/l	millimoles per litre
CBR	Chemical / Biological / Radiation	HR	Heart Rate	MOI	Mechanism of Injury
CCF	Congestive Cardiac Failure	Hx	History	MTS	Major Trauma Service
C.O.	Cardiac Output (L/min.)	ICP	Intensive Care Paramedic	MV	Minute Ventilation
COPD	Chronic Obstructive Pulmonary Disease	IFS	Intubation Facilitated by Sedation	Mx	Management
		IM	Intramuscular	NB	Note well



# Guide to Abbreviations

NEPT	Non Emergency Patient Transport	ROSC	Return of Spontaneous Circulation	VF	Ventricular Fibrillation
NFR	Not For Resuscitation	RSA	Respiratory Status Assessment		
NG	Nasogastric	RSI	Rapid Sequence Intubation		
NPA	Nasopharyngeal Airway	RTA	Road Traffic Accident	Vol	Volume
NSTEMI	Non-ST Elevation Myocardial Infarction	R/V	Rendezvous		
O <sub>2</sub>	Oxygen	Rx	Treatment		
OD	Overdose	S Rural	Selected AV Rural APs permitted to perform skill	VSS	Vital Signs Survey
ODD	Oesophageal Detector Device	SCI	Spinal Cord Injury		
OG	Orogastric	sec.	second		
OPA	Oropharyngeal Airway	SIMV	Synchronous Intermittent Mandatory Ventilation	V <sub>T</sub>	Tidal Volume
PCI	Percutaneous Coronary Intervention	S/L	Sublingual		
PCR	Pt Care Record	SOB	Short of Breath	VT	Ventricular Tachycardia
PEA	Pulseless Electrical Activity	SpO <sub>2</sub>	Saturation of haemoglobin with O <sub>2</sub> measured by Pulse Oximetry		
PEEP	Positive End-Expiratory Pressure	SV	Stroke volume		
PHx	Past History	SVT	Supraventricular tachycardia	Wt	Weight (kg)
PIP	Peak Inspiratory Pressure	STEMI	ST Elevation Myocardial Infarction		
pMDI	Pressurised Metered Dose Inhaler	TBI	Traumatic Brain Injury		
PSA	Perfusion Status Assessment	TCA	Tricyclic Antidepressant		
PPE	Personal Protective Equipment	TKVO	To Keep Vein Open	x/60	x minutes e.g. 5/60 = 5 minutes
PSV	Pressure Support Ventilation	TPT	Tension Pneumothorax		
Pt	Patient	Tx	Transport		
PV	Per Vagina	UA	Unstable Angina	@ x/60	e.g. @ 5/60 = at 5 minutely intervals
QRS	QRS complex of ECG				

# Graphic Guide

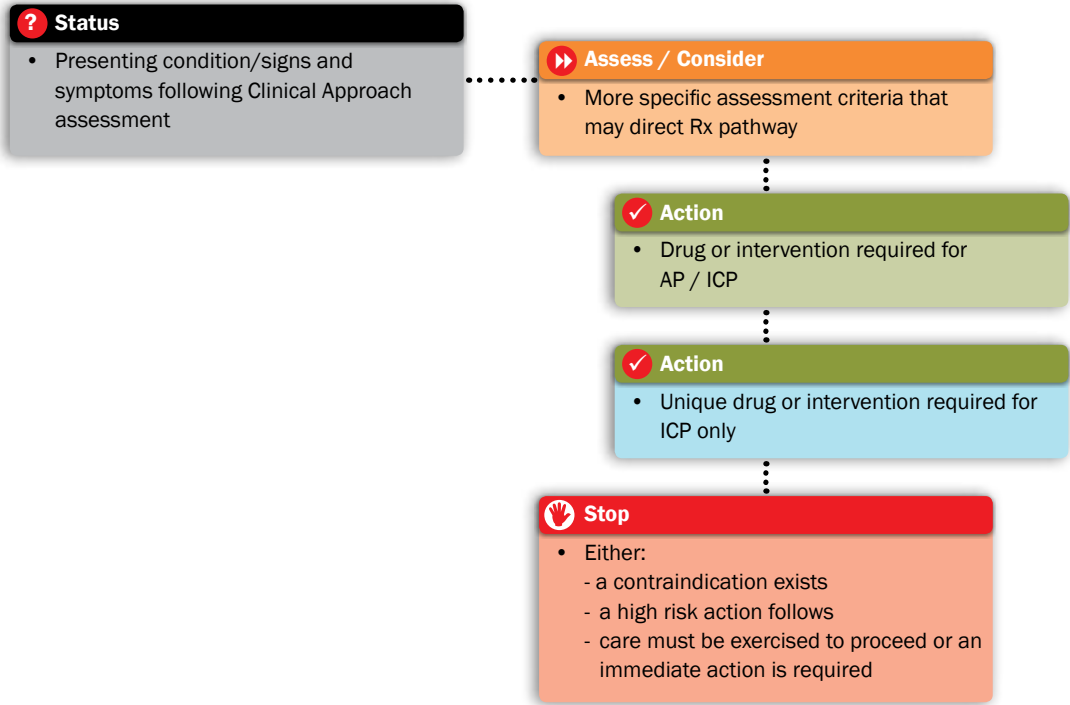
## Special Notes

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

## General Care

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

# Graphic Guide















# Clinical Approach to a Patient

## CPG A0101

Stop	Primary Survey / Life Threat Status	
	<b>Standard Precautions:</b> Gloves, safety glasses, helmet, mask, vest, other PPE as supplied <b>Dangers</b> <b>Response</b> <b>Airway</b> Cervical spine immobilisation if required <b>Breathing</b> Assist ventilations if $V_T$ inadequate <b>Circulation</b> Commence CPR if required and apply Cardiac Monitor <b>Haemorrhage</b> Control life threatening haemorrhage	<b>Immediate Mx + Sitrep required (Utilise ETHANE mnemonic)</b>
Action		
	<b>Rapport, Rest and Reassurance</b> <b>Posture / Position of comfort</b> <b>Oxygen as required (e.g. hypoxia, respiratory distress)</b>	<b>In order of clinical need</b> <b>If clinically applicable, assess Hx prior to physical contact with Pt e.g. Vital Signs Survey, applying monitor, exposing chest</b>
Assess	History	
	<b>Brief clinical Hx</b> <b>Event prior to Ambulance call</b> <b>Past medical Hx</b> <b>Pain – assessment</b> <b>Medications</b> <b>Allergies</b>	<b>Accurate Hx + assessment essential for problem recognition</b>

# Clinical Approach to a Patient

## CPG A0101

Assess	Vital Sign Survey	
	<b>GCS</b> <b>PSA</b> <b>RSA</b> <b>Pattern / mechanism of injury / medical condition</b>	Determine time criticality to Mx accordingly Accurate body system assessment in all Pts
	Assessment Tools / Secondary Survey	
	<b>Secondary Survey</b> <b>SpO<sub>2</sub></b> <b>Monitor / ECG (12 lead if available)</b> <b>Temp</b> <b>EtCO<sub>2</sub></b> <b>More detailed Hx</b> <b>BGL - Blood Glucose Level</b>	Thorough physical examination - Head to toe - Inspection, palpation, auscultation
Determine Main Presenting Problem		
	The combination of subjective (PHx, Hx, Med's) and objective (physical) data allows identification of clinical problems Multiple problems may be identified and prioritised to provide treatment order Some overlap in treatment may address multiple problems	<b>Confirm clinical reasoning with assessment data</b>

# Clinical Approach to a Patient

# CPG A0101

Action		
	<div>Further Sitrep / Resource requirements as required</div> <div>Consider ICP backup</div> <div>Consider time to hospital vs time to R/V with ICP</div> <div>IV access if required</div> <div>Specific treatment - appropriate CPG applied to Mx clinical problems</div> <div>Transport to appropriate facility</div> <div>Reassess frequently and adapt Mx as appropriate</div> <div>Final assessment at destination / handover</div>	

**This Clinical Approach is to be applied to all Pts as a basic level of care. There is an assumption in each CPG that this is the minimum level of care that the Pt will receive prior to the application of the Guideline.**

**The exception to this rule is the Pt in immediate life threat that requires intervention during the Primary Survey.**

# Perfusion Assessment

## CPG A0102

### Special Notes

These observations and criteria need to be taken in context with:

- The Pt's presenting problem
- The Pt's prescribed medication
- Repeated observations and the trends shown
- Response to management.

#### • **Perfusion Definition**

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

#### • **Perfusion Assessment**

Other factors may affect the interpretation of the observations made, e.g., the environment, both cold and warm ambient temp. may affect skin signs; anxiety may affect pulse rate; and the many causes of altered conscious state or unconsciousness. Other conditions may affect conscious state observations such as poor cerebral perfusion, respiratory hypoxia, head injuries, hypoglycaemia and drug overdoses.

The Perfusion Status Assessment table represents a graded progression from adequate to no perfusion.

# Perfusion Status Assessment

## CPG A0102

	Skin	Pulse	BP	Conscious Status	Capillary Refill
<b>Adequate Perfusion</b>	Warm, pink, dry	60 – 100/min	> 100mmHg systolic	Alert and orientated in time and place	≤ 2 secs
<b>Borderline Perfusion</b>	Cool, pale, clammy	50-100/min	80-100mmHg systolic	Alert and orientated in time and place	> 2 secs
<b>Inadequate Perfusion</b>	Cool, pale, clammy	< 50/min, or > 100/min	60 – 80mmHg systolic	Either alert and orientated in time and place or altered	> 2 secs
<b>Extremely Poor Perfusion</b>	Cool, pale, clammy	< 50/min, or > 110/min	< 60mmHg systolic or unrecordable	Altered or unconscious	> 2 secs
<b>No Perfusion</b>	Cool, pale, clammy	Absence of palpable pulse	Unrecordable	Unconscious	NIL

# Respiratory Status Assessment

## CPG A0103

	Normal	Mild Distress	Moderate Distress	Severe Distress (Life Threat)
<b>General Appearance</b>	Calm, quiet	Calm or mildly anxious	Distressed or anxious	Distressed, anxious, fighting to breathe, exhausted, catatonic
<b>Speech</b>	Clear and steady sentences	Full sentences	Short phrases only	Words only or unable to speak
<b>Breath Sounds And Chest Auscultation</b>	Usually quiet no wheeze  No crackles or scattered fine basal crackles, e.g. postural	Able to cough  <b>Asthma:</b> mild expiratory wheeze  <b>LVF:</b> may be some fine crackles at bases	Able to cough  <b>Asthma:</b> expiratory wheeze, +/- inspiratory wheeze  <b>LVF:</b> crackles at bases - to mid-zone	Unable to cough  <b>Asthma:</b> expiratory wheeze +/- inspiratory wheeze, maybe no breath sounds (late).  <b>LVF:</b> fine crackles – full field, with possible wheeze <b>Upper Airway Obstruction:</b> Inspiratory stridor
<b>Respiratory Rate</b>	12 – 16	16 – 20	> 20	> 20 Bradypnoea (< 8)
<b>Respiratory Rhythm</b>	Regular even cycles	<b>Asthma:</b> may be slightly prolonged expiratory phase	<b>Asthma:</b> prolonged expiratory phase	<b>Asthma:</b> prolonged expiratory phase
<b>Breathing Effort</b>	Normal chest movement	Slight increase in normal chest movement	Marked chest movement +/- use of accessory muscles.	Marked chest movement with accessory muscles, intercostal retraction +/- tracheal tugging
<b>Pulse Rate</b>	60 – 100	60 – 100	100 – 120	> 120, bradycardia late sign
<b>Skin</b>	Normal	Normal	Pale and sweaty	Pale and sweaty, +/- cyanosis
<b>Conscious State</b>	Alert	Alert	May be altered	Altered or unconscious
<b>Oxygen Saturation Room Air</b>	> 95%	> 95%	< 95%	< 90%

# Conscious State Assessment

# CPG A0104

## Glasgow Coma Score (GCS)

### Introduction

The conscious state of a pt needs to be assessed in a way that is reproducible and objective. The GCS is a neurological scale which enables a pt's level of consciousness to be assessed in a methodical, reproducible way. GCS scores range from 3 to 15.

A. Eye Opening		Score	
Spontaneous		4	
To Voice		3	
To Pain		2	
None		1	A:
B. Verbal Response		Score	
Orientated		5	
Confused		4	
Inappropriate words		3	
Incomprehensible sounds		2	
None		1	B:
C. Motor Response		Score	
Obeys Command		6	
Purposeful Movement (pain)		5	
Withdraws (pain)		4	
Flexion (pain)		3	
Extension (pain)		2	
None		1	C:
<b>Total GCS (Max. Score = 15)</b>			
			( A + B + C ) = GCS

# Time Critical Guidelines

## CPG A0105

### Introduction

The concept of the “Time Critical” Pt allows the recognition of the severity of a Pt’s condition or the likelihood of deterioration. This identification directs appropriate clinical management and the appropriate destination to improve outcome. Covered within the Time Critical Guidelines are:

- Triage decisions for a Pt with Major Trauma
- Triage decisions for a Pt with significant Medical Conditions
- Requests for additional resources including ICP and Aeromedical services
- Judicious scene time management (e.g. should not exceed 20min for non-trapped major trauma Pt)
- Appropriate receiving hospital and early notification

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

### Time Critical Definitions

<b>Actual</b>	At the time the vital signs survey is taken, the Pt is in actual physiological distress.
<b>Emergent</b>	At the time the vital signs survey is taken, the Pt is not physiologically distressed but does have a “Pattern of Injury or Significant Medical Condition” which is known to have a high probability of deteriorating to actual physiological distress.
<b>Potential</b>	At the time the vital signs survey is taken, the Pt is not physiologically distressed and there is no significant “Pattern of actual Injury/Illness”, but does have a “Mechanism of Injury/Illness” known to have the potential to deteriorate to actual physiological distress.



# Time Critical Guidelines

## CPG A0105

### Trauma Triage

Pts meeting the criteria for Major Trauma should be transported to the major regional facility unless transport times are prolonged >60 mins. The receiving hospital must also be notified to ensure an appropriate reception team and facilities are available.

### Mechanism of Injury (MOI)

A Pt under the Trauma Triage Guidelines meets the criteria for Major Trauma if they have a combination of MOI and other Co-morbidities constituting:

- Systemic illness limiting normal activity / Systemic illness constant threat to life. Examples include:
  - Poorly controlled hypertension
  - Morbid obesity
  - Controlled or uncontrolled Congestive Cardiac Failure
  - Symptomatic COPD
  - Ischaemic heart disease
  - Chronic renal failure or liver disease
- Pregnancy
- Age < 16 or > 60

### Medical Triage

Pts meeting the time critical criteria for Medical conditions are regarded as having, or potentially having, a clinical problem of major significance. These Pts are time critical and should be transported to the major regional facility unless transport times are prolonged >60 mins.

# Trauma Time Critical Guidelines

## CPG A0105

### Actual Time Critical

### Emergent Time Critical

#### ? Status

- Possible major trauma

#### ➔ Assess Vital Signs

- Any of the following:
  - Respiratory Rate < 12 or > 24
  - BP < 90
  - Pulse < 50 or > 120
  - GCS < 13
  - Oxygen saturation < 90%

#### ? Vital Signs are normal

- May have Pattern of Injury

#### ➔ Assess Pattern of Injury

- Any of the following:
  - **Penetrating Injuries**
    - Head / Neck / Chest / Abdomen / Pelvis / Axilla / Groin
  - **Blunt Injuries**
    - Significant injury to a single region: Head / Neck / Chest / Abdomen / Axilla / Groin
    - Injuries involving two or more of the above body regions
  - **Specific Injuries**
    - Limb amputations / limb threatening injuries
    - Suspected spinal cord injury
    - Burns > 20% or involving respiratory tract
    - Serious crush injury
    - Major compound fracture or open dislocation
    - Fracture to two or more of the following: Femur / Tibia / Humerus
    - Fractured pelvis

#### ? Vital Signs not normal

#### ✓ Action

- Transport to the major regional facility unless transport times are prolonged > 60 mins

#### ⚠ Consider ICP

#### ? Significant Pattern of Injury

- Vital Signs are normal

#### ✓ Action

- Transport to the major regional facility unless transport times are prolonged > 60 mins

#### ⚠ Consider ICP

# Trauma Time Critical Guidelines

## CPG A0105

### Potentially Time Critical

#### ? No Pattern of Injury

- Vital Signs are normal
- May have Mechanism of Injury

#### ➔ Assess Mechanism of Injury (MOI)

- Any of the following:
  - Ejection from vehicle
  - Motor / cyclist impact > 30km/h
  - Fall from height > 3m
  - Struck on head by falling object > 3m
  - Explosion
  - High speed MVA > 60km/h
  - Vehicle rollover
  - Fatality in same vehicle
  - Pedestrian impact
  - Prolonged extrication > 30min.

#### ➔ Assess Co-morbidities

- Any of the following:
  - Age > 60
  - Pregnancy
  - Significant underlying medical condition

#### ? Positive MOI and Co-morbidities

- Vital Signs are normal
- No Pattern of Injury

#### ✓ Action

-  Transport to the major regional facility unless transport times are prolonged > 60 mins

### Not Time Critical

#### ? No MOI

- Vital Signs are normal
- No Pattern of Injury

#### ✓ Action

- Triage to nearest appropriate facility if required

#### ? Positive MOI and NO Co-morbidities

- Vital Signs are normal
- No Pattern of Injury

#### ✓ Action

- Triage to nearest appropriate facility

# Trauma Time Critical Guidelines (Paediatric)

## CPG A0105

### Actual Time Critical

#### ? Status

- Possible major trauma

#### ➔ Assess Vital Signs

	Newborn < 2 weeks	Infant < 1 year
Respiratory Rate	< 40 or > 60 N/A	< 20 or > 50 < 60 mm Hg
BP	< 100 or > 170 GCS < 15	< 90 or > 170 GCS < 15
Pulse	N/A	N/A
Conscious State	N/A	N/A
O <sub>2</sub> saturation	cold / pale / clammy	cold / pale / clammy
Skin		
	<b>Child 1 - 8 years</b>	<b>Large Child 9 - 15 years</b>
Respiratory Rate	< 20 or > 35 < 70 mm Hg	< 15 or > 25 < 80 mm Hg
BP	< 75 or > 130 GCS < 15	< 65 or > 100 GCS < 15
Pulse	N/A	< 90%
Conscious State	cold / pale / clammy	cold / pale / clammy
O <sub>2</sub> saturation		
Skin		

#### ? Vital Signs not normal

#### ● Action

Transport to the major regional facility unless transport times are prolonged > 60 mins

Consider ICP

### Emergent Time Critical

#### ? Vital Signs are normal

- May have Pattern of Injury

#### ➔ Assess Pattern of Injury

- Any of the following:
- **Penetrating Injuries**
  - Head / Neck / Chest / Abdomen / Pelvis / Axilla / Groin
- **Blunt Injuries**
  - Significant injury to a single region: Head / Neck / Chest / Abdomen / Axilla / Groin
  - Injuries involving two or more of the above body regions
- **Specific Injuries**
  - Limb amputations / limb threatening injuries
  - Suspected spinal cord injury
  - Burns > 10% or involving respiratory tract
  - Serious crush injury
  - Major compound fracture or open dislocation
  - Fracture to two or more of the following: Femur / Tibia / Humerus
  - Fractured pelvis

#### ? Significant Pattern of Injury

- Vital Signs normal

#### ✓ Action

Transport to the major regional facility unless transport times are prolonged > 60 mins

Consider ICP

# Trauma Time Critical Guidelines (Paediatric)

## CPG A0105

### Potentially Time Critical

- May have Mechanism of Injury

#### ➔ Assess Mechanism of Injury (MOI)

- Any of the following:
  - Ejection from vehicle
  - Motor/cyclist impact > 30km/h
  - Fall from height > 3m
  - Struck on head by falling object > 3m
  - Explosion
  - High speed MVA > 60km/h
  - Vehicle rollover
  - Fatality in same vehicle
  - Pedestrian impact
  - Prolonged extrication > 30min.

### Not Time Critical

#### ? No MOI

- Vital Signs are normal
- No Pattern of Injury
- ✓ **Action**
  - Triage to nearest appropriate facility if required

#### ? Positive MOI

- Vital Signs are normal
- No Pattern of Injury

#### ✓ Action

- Transport to the major regional facility unless transport times are prolonged > 60 mins

# Medical Time Critical Guidelines

## CPG A0105

### Actual Time Critical

#### ? Status

- Possible Medical time critical

#### ➔ Assess Vital Signs

- Any of the following:
  - Severe Respiratory Distress
  - Oxygen saturation < 90% Room Air / 93% supplemental O<sub>2</sub> (consider low SpO<sub>2</sub> COPD patient)
  - Inadequate Perfusion
  - GCS < 13 (unless normal for Pt)
  - 12 lead ECG showing STEMI pattern

### Emergent Time Critical

#### ? Vital Signs are normal

May have Significant Medical Condition

#### ➔ Assess Medical Condition

- Any of the following:
  - Medical Symptoms / Syndromes
    - Acute Coronary Syndrome
    - Acute stroke
    - Severe sepsis, including suspected meningococcal disease
    - Possible Abdominal Aortic Aneurysm
    - Undiagnosed severe pain
    - Acute Asthma / COPD with moderate resp. distress
  - Notify communications for possible need of hyperbaric treatment e.g. acute decompression illness or cyanide poisoning
  - Hypothermia or Hyperthermia

#### ? Vital Signs not normal

#### ✓ Action

- Transport to the major regional facility unless transport times are prolonged > 60 mins
- Consider ICP

#### ? Significant Medical Condition

- Vital Signs normal

#### ✓ Action

- Transport to the major regional facility unless transport times are prolonged > 60 mins
- Consider ICP

# Mental Status Assessment

# CPG A0106

## Observations

**A mental status assessment is a systematic method used to evaluate a Pt's mental function. In undertaking a mental status assessment, the main emphasis is on the person's behaviour. This assessment is designed to provide Paramedics with a guide to the Pt's behaviour, not to label or diagnose a Pt with a specific condition.**

<b>1. Appearance</b>	Neatness, cleanliness Pupils – size Extraocular movements
<b>2. Behaviour</b>	Bizarre or inappropriate Threatening or violent Unusual motor activity, such as grimacing or tremors Impaired gait Psychomotor retardation or agitation
<b>3. Speech</b>	Rate, volume, quantity, content
<b>4. Mood</b>	Depressed, agitated, excited or irritable
<b>5. Response</b>	Flat – unresponsive facial expression Appropriate / inappropriate
<b>6. Perceptions</b>	Hallucinations
<b>7. Thought content</b>	Delusions (i.e., false beliefs) Suicidal thoughts Overly concerned with body functions (eg. Bowels)
<b>8 Thought flow</b>	Jumping irrationally from one thought to another
<b>9. Concentration</b>	Poor ability to organise thoughts Short attention span Poor memory Impaired judgement Lack of insight

# Stroke Assessment

## CPG A0107

? Stroke signs and symptoms			
Assessment	Findings		
Facial Droop	Pt shows teeth or smiles	<b>Normal</b> - both sides of face move equally	<b>Abnormal</b> - one side of face does not move as well as the other
Arm Drift	Test as for GCS	<b>Normal</b> - equal hand grip	<b>Abnormal</b> - unilateral weakness
Speech	The Pt repeats "You can't teach an old dog new tricks"	<b>Normal</b> - the Pt says the correct words, no slurring	<b>Abnormal</b> - the Pt slurs words, says the wrong words, or is unable to speak or understand
Time	Time of onset of these symptoms should be assessed		
Blood glucose	Test for BGL	<b>Normal</b> - BGL	<b>Abnormal</b> - if hypoglycemia manage as per <b>CPG A0702 Glycaemic Emergencies</b>

▶▶ Consider and exclude stroke mimics

▶▶ Determine and document exact time of onset of stroke symptoms

✓ Notify receiving hospital if no co-morbidities and onset of symptoms < than 6hr.

▶▶ Continue management and transport to a hospital offering an acute stroke service if appropriate

### ▶▶ Assess / Consider

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

### ▶▶ Possible Co-morbidities

- Dementia
- Significant pre-existing physical disability

### ▶▶ Assessing onset timeframe

- If Pt wakes with a deficit or inability to communicate, the time is taken from when the Pt was last seen deficit free. Accurate timeframe for onset of symptoms is critical for Rx:  
 < 3hr. for IV thrombolytic  
 < 6hr. for other therapies



# Oxygen Therapy

## CPG A0108

### Key Considerations

#### Introduction:

- This CPG should only be applied to patients aged  $\geq 16$  years

#### Mx Principles

- O<sub>2</sub> is a treatment for hypoxaemia, not breathlessness. O<sub>2</sub> has not been shown to have any effect on the sensation of breathlessness in non-hypoxaemic patients.
- Treatment is aimed at achieving normal or near normal SpO<sub>2</sub> in acutely ill patients. O<sub>2</sub> should be administered to achieve a target SpO<sub>2</sub> while continuously monitoring the patient for any changes in condition.
- Oxygen should not be given routinely to patients with normal SpO<sub>2</sub>. This includes those with stroke, ACS and arrhythmias.
- Oxygen given to raise SpO<sub>2</sub> above 92% should be treated as a drug that can be harmful in some patients, particularly older people with underlying lung disease (particularly COPD) which may not be clinically apparent. Therefore, the default approach in patients with COPD should be to keep SpO<sub>2</sub> between 88-92%, unless there is a clear indication for oxygen therapy.
- If pulse oximetry is not available or unreliable, consider an initial oxygen dose of 2-6 L/min via nasal cannulae or 5-10 L/min via face mask until a reliable SpO<sub>2</sub> reading can be obtained or symptoms resolve.

#### Special Circumstances

- Early aggressive O<sub>2</sub> administration may benefit patients who develop critical illnesses and are haemodynamically unstable, such as cardiac arrest or resuscitation; major trauma / head injury; carbon monoxide poisoning; shock; severe sepsis; and anaphylaxis. In the first instance, O<sub>2</sub> should be administered with the aim of achieving an SpO<sub>2</sub> of 100%. Once the patient is haemodynamically stable, O<sub>2</sub> dose should be titrated to normal levels.
- Patients with chronic hypoxaemia (e.g. COPD, neuromuscular disorders, morbid obesity etc.) are at risk of hypoventilation and respiratory arrest if SpO<sub>2</sub> is raised above 92%. However, if such a patient is critically ill and a cardio-respiratory arrest is thought to be imminent, high flow oxygen +/- assisted ventilation is probably warranted as initial therapy. Oxygen can be titrated down later, once the patient has stabilised.
- COPD should be suspected in any patient over 40 years old who is: a smoker or ex-smoker, experiencing dyspnoea that is progressive, persistent and worse with exercise, has a chronic cough or chronic sputum production, has a family history of COPD.

# Oxygen Therapy

## CPG A0108

### Special Notes

- Pulse oximetry may be particularly unreliable in patients with peripheral vascular disease, severe asthma, severe anaemia, cold extremities or peripherally 'shut down', severe hypotension and carbon monoxide poisoning.
- Pulse oximetry can be unreliable in the setting of severe hypoxia. An SpO<sub>2</sub> reading below 80% increases the chance of being inaccurate.
- All patients with suspected carbon monoxide poisoning, Diving emergency or pneumothorax should be given high dose oxygen until arrival at hospital. In these clinical situations, patients who show no signs of breathlessness may still benefit from this treatment.
- Poisoning with substances other than carbon monoxide should be given O<sub>2</sub> to maintain an SpO<sub>2</sub> of 94-98%.
- Special circumstances occur in the setting of paraquat poisoning or bleomycin exposure where the use of O<sub>2</sub> therapy may prove detrimental to the patient. The maintenance of prophylactic hypoxaemia in these patients (SpO<sub>2</sub> of 88-92%) is recommended
- Irrespective of SpO<sub>2</sub> patient tidal volume should be assessed to ensure ventilation is adequate.

### Oxygen Administration Strategies

- Nasal Cannulae with oxygen at 2-6L/minute
- Non Rebreather mask with oxygen at 10-15L/minute
- BVM ventilation with 100% oxygen

### General Care

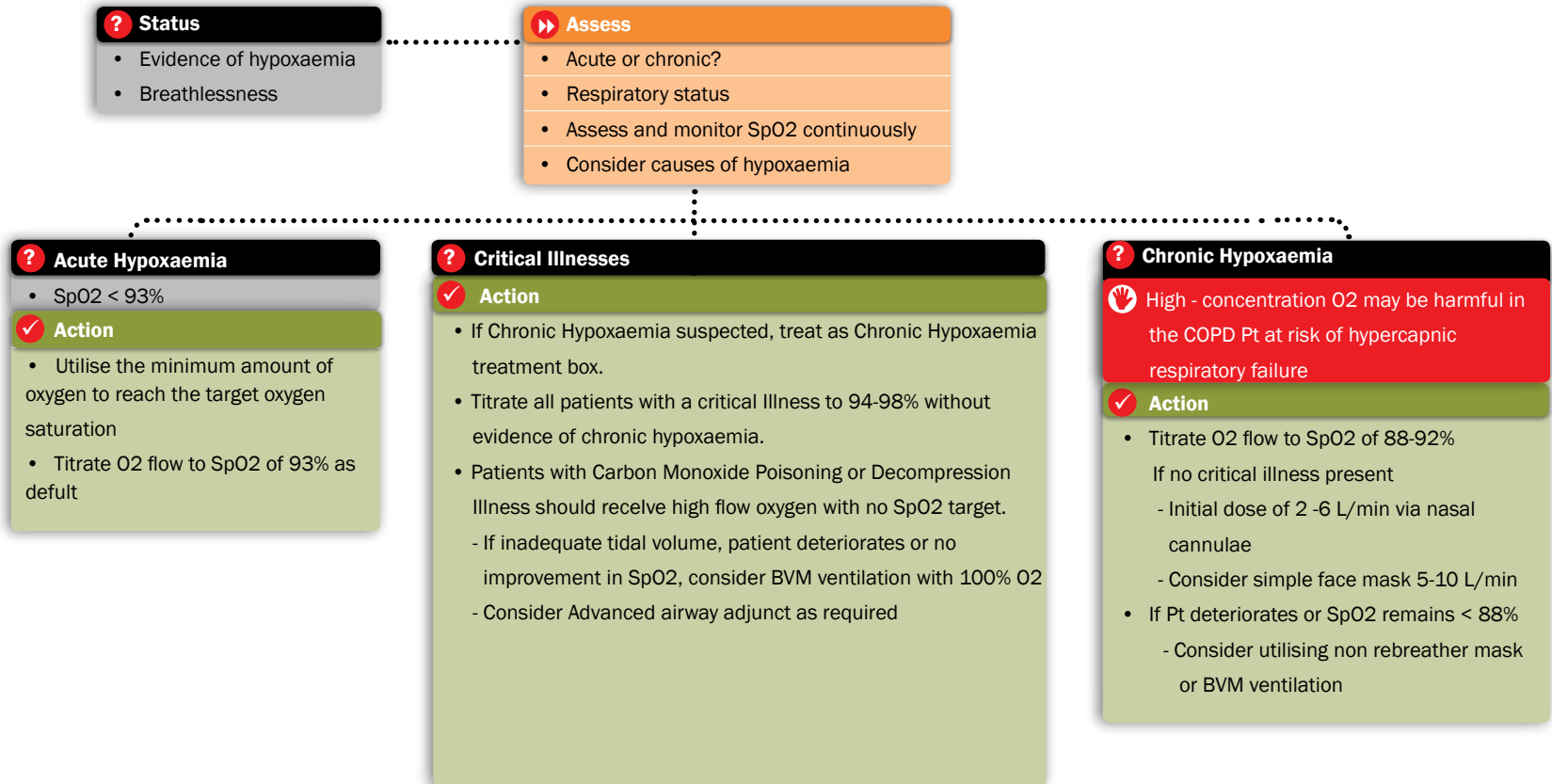
- O<sub>2</sub> exchange is at its greatest in the upright position. Unless other clinical problems determine otherwise, the upright position is the preferred position when administering O<sub>2</sub>.
- Ensure the patient's fingertips are clean of soil or nail polish. Both may affect the reliability of the pulse oximeter reading. The presence of nail infection may also cause falsely low readings.
- Take due care with patients who show evidence of anxiety/panic disorders (e.g. hyperventilation syndrome). O<sub>2</sub> is not required however no attempt should be made to retain CO<sub>2</sub> (e.g. paper bag breathing).
- All women with evidence of hypoxaemia who are more than 20 weeks pregnant should be managed with left lateral tilt to improve cardiac output.
- Face masks should not be used for flow rates < 5 L/min due to the risk of CO<sub>2</sub> retention.
- Nasal cannulae are likely to be just as effective with mouth-breathers. However, where nasal passages are congested or blocked, face masks should be used to deliver O<sub>2</sub> therapy.

### Critical illnesses for Oxygen Therapy CPG include:

- Cardiac arrest or resuscitation
- Major trauma/head injury
- Carbon monoxide poisoning
- Acute Coronary Syndrome
- Shock (including Severe Sepsis and Anaphyaxis)
- Stroke
- Decompression illness
- Status epilepticus

# Oxygen Therapy

## CPG A0108







# Cardiac Arrest

## CPG A0201

### Principles of CPR

#### CPR

- ECC is commenced immediately and continued throughout cardiac arrest.
- Generic for all adult cardiac arrest conditions
- Interruptions to chest compressions must be minimised
- Change operators every 2 mins to improve ECC performance and reduce fatigue
- Compress to 1/3 chest depth or at least 5cms (Adult); allowing chest recoil after each compression
- **Rhythm / Pulse check every 2min.**
- ECC commenced immediately after defibrillation and pulse check after 2 mins
- Remember to push hard and fast

#### Ratios: compressions to ventilations

##### Not intubated

- 30 : 2
- Rate: Approximately 100 - 120 compressions per min
  - Pause for ventilations

##### Intubated / Supra Glottic device inserted

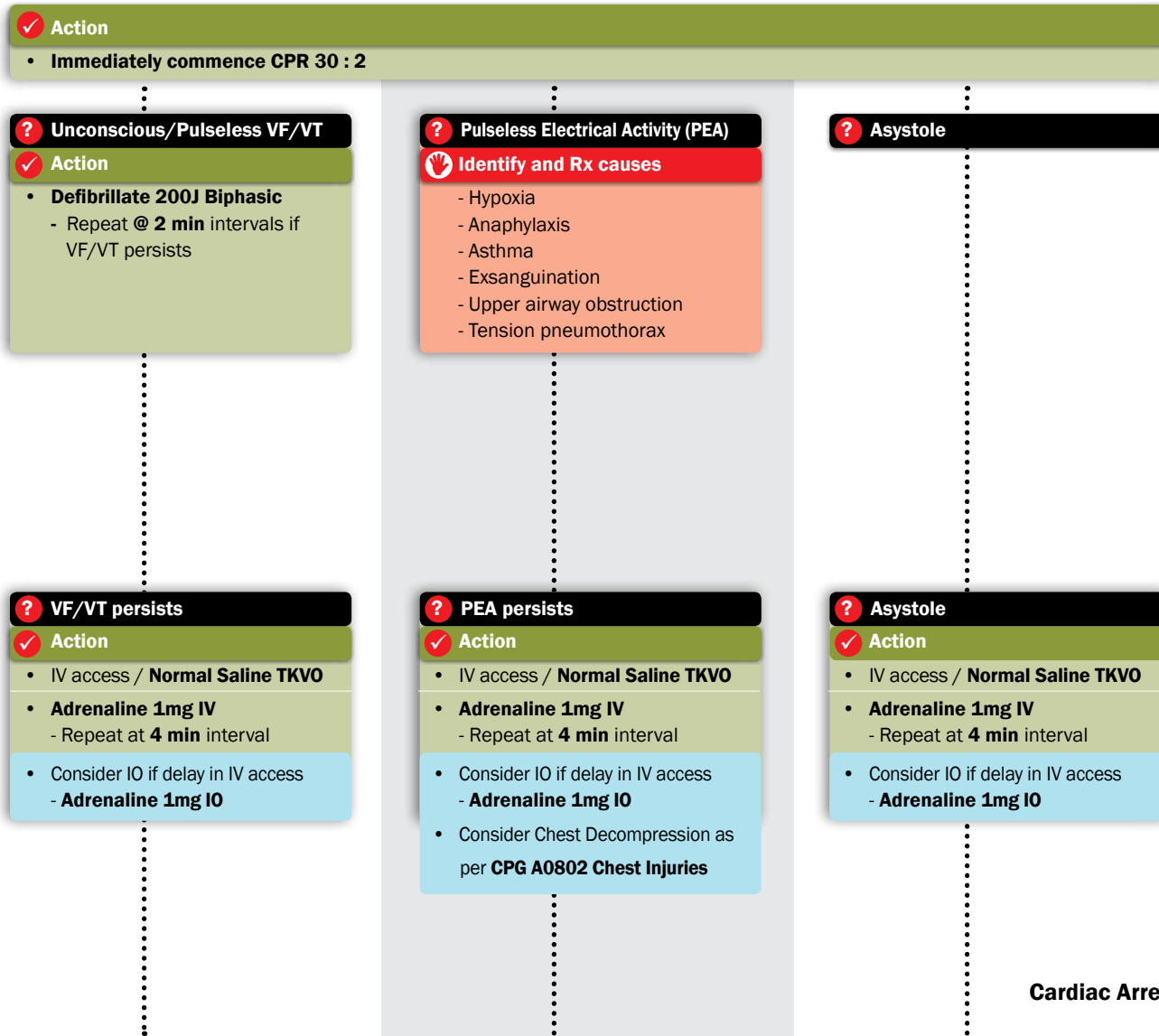
- 15 : 1
- Rate: Approximately 100 - 120 compressions per min
  - 8-10 ventilations/min
  - No pause for ventilations

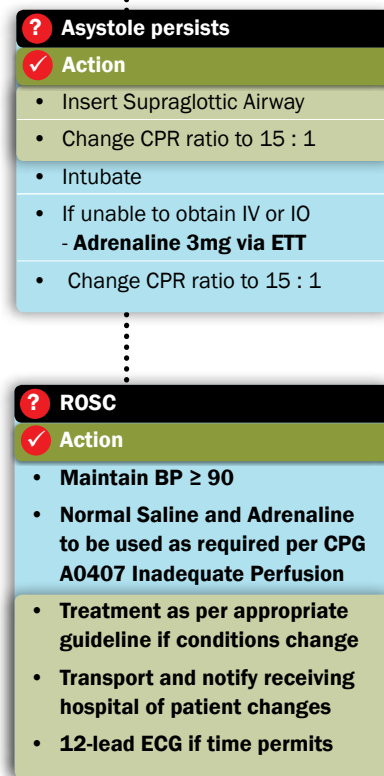
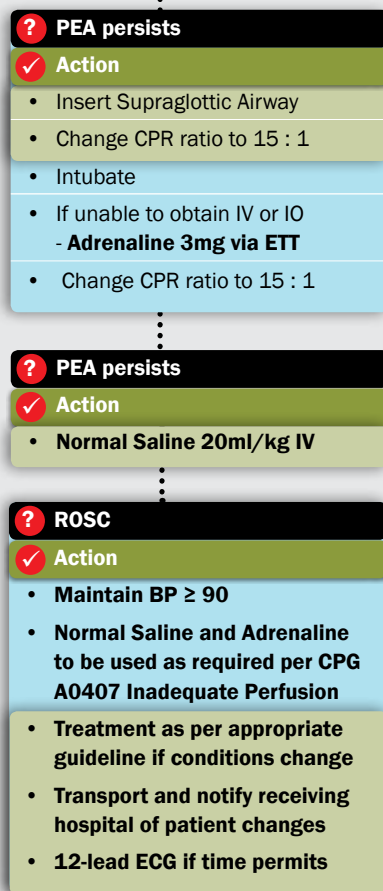
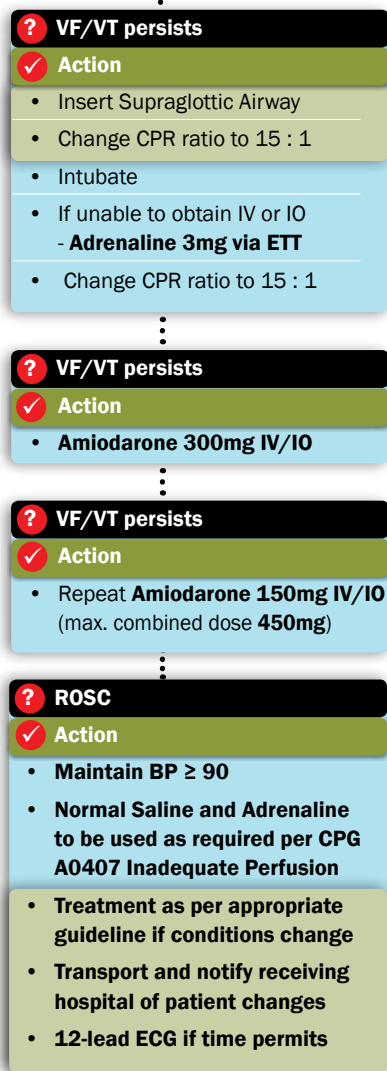
#### Adjustment for temperature

- **> 32°C**
  - Standard Cardiac Arrest Guidelines
- **30 – 32°C**
  - Double dosage intervals in relevant cardiac arrest guideline
  - Do not rewarm beyond 33°C if ROSC
- **< 30°C**
  - Continue CPR and rewarming until temp. > 30°C
  - One defibrillation shock only
  - One dose of Adrenaline
  - One dose of Amiodorone
  - **Withhold Sodium Bicarbonate 8.4% IV**

# Cardiac Arrest

## CPG A0201





**Sodium Bicarbonate** may be administered if hyperkalaemia suspected or cardiac arrest secondary to TCA overdose per **A707(B) Management of Overdose: TCA**

**Magnesium Sulphate 2g** should be administered instead of Amiodarone in the event of Torsade de Pointes.

**Repeat Magnesium Sulphate 2g once after 10minutes as required.**



# Withholding and / or Ceasing Pre-hospital resuscitation

**CPG A0203**

## Special Notes

- An Advanced Care Directive may be sighted by the attending Ambulance crew, or they may accept in good faith the advice of those present at the scene. If there is any doubt about the application of an order the default position of resuscitation should be adopted.
- An Advanced Care Directive only applies in relation to a current condition. When ceasing or withholding resuscitative efforts the attending Clinician needs to be satisfied that the Pt's cardiac arrest is most likely due to this current condition cited in the Advanced Care Directive.

## Special Notes

- Ambulance crews must clearly record full details of the information given to them and the basis for their decision regarding resuscitation. This is particularly important in circumstances when a copy of the Advanced Care Directive has not been sighted as this documentation may serve as evidence of their good faith.

# Withholding and / or Ceasing out-of-hospital resuscitation

**CPG A0203**

- **Circumstances where resuscitation efforts may be withheld**

- There is a likely risk to Paramedic health and safety
- Clear evidence of prolonged cardiac arrest (e.g. rigor mortis, decomposition, postmortem lividity)
- Injuries incompatible with life (e.g. decapitation)
- Inadequate resources to deal with the number of Pts (e.g. multi-casualty incidents)
- Death is declared by Medical Officer who is, or has been, at the scene
- An adult (18 years or older), where an Advanced Care Directive order has been completed for a current condition which most likely caused the cardiac arrest
- A child (< 18 years), where a Court Order is provided to the attending Ambulance crew indicating that Cardiopulmonary Resuscitation is not to be commenced
- Any patient whose initial cardiac rhythm is asystole (over a minimum 30 sec period), provided the time interval between the onset of cardiac arrest, i.e. collapse, and arrival of the crew at the Pt has exceeded 20min without effective CPR and there are no compelling reasons to continue, such as suspected hypothermia, suspected drug overdose, or family / bystanders request continued efforts.
- An Advanced Care Directive is available for the patient.

- **Circumstances where resuscitation efforts may be ceased**

- Any patient who, after 30 mins of resuscitation has no return of spontaneous circulation, is not in VF or VT, there are no other signs of life present such as gasps or pupil reaction and when hypothermia or drug overdose are not suspected.









# Supraglottic Airway

# CPG A0301

## Special Notes

- The supraglottic airway provides improved airway and ventilation Mx compared to using a facemask and OPA. The supraglottic airway does not protect against aspiration although studies have shown it to be as low as 3.5% with an LMA compared to 12.4% with a Bag Valve Mask (BVM). **A supraglottic airway should therefore not be regarded as the equivalent of endotracheal intubation.**
- A supraglottic airway forms a low pressure seal around the posterior perimeter of the larynx and when correctly inserted is seated superior to the oesophageal sphincter enabling positive pressure ventilation via BVM or closed circuit resuscitator. Unconscious Pts who accept an OPA are generally suitable for insertion of a supraglottic airway.
- Pts with morbid obesity have naturally increased work of breathing and during assisted or intermittent positive pressure ventilation may require higher pressures to inflate the lungs. They also have a higher incidence of hiatus hernia resulting in an increased likelihood of passive regurgitation of stomach contents.

## General Care

- If insertion fails and ventilation is difficult or inadequate, check position of supraglottic airway. If minor adjustment fails to correct the problem, remove the supraglottic airway. Immediately insert an OPA/NPA and ventilate the Pt using a BVM.
- Only one attempt may be made to reinsert a supraglottic airway. If insertion fails on the 2nd attempt, do not delay returning to BVM using an OPA/NPA.
- A supraglottic may be used for the unconscious APO Pt. However, gentle assisted ventilation should be provided.
- A supraglottic airway may be inserted in left or right lateral positions or if entrapped, in a sitting position. Pts may be managed in the lateral position when a supraglottic airway has been correctly inserted and taped in situ, using AT approved securing devices, however, in general, it is recommended that Pts be Mx supine and carefully observed for aspiration.
- If the conscious state of the Pt improves and there is an attempt to reject the supraglottic airway, remove the device. (deflating cuff first if required by the device)

# Supraglottic Airway

## CPG A0301

### ? Status

- Unconscious Pt without gag reflex
- Ineffective ventilation with BVM and airway Mx (OPA/NPA)
- >10 min assisted ventilation required
- Unable to intubate / difficult intubation



### Stop

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



### » Consider

- **Precautions**
  - Inability to prepare the Pt in the “sniffing position”
  - Pts who require high airway pressures, e.g. advanced pregnancy, morbid obesity, decreased pulmonary compliance (stiff lungs due to pulmonary fibrosis) or increased airway resistance (severe asthma)
  - Pts < 14 years of age due to enlarged tonsils
  - Significant volume of vomit in airway
- **Side Effects**
  - Correct placement of the supraglottic airway does not prevent passive regurgitation or gastric distension

### I-Gel Size Chart

Size	Wt	Gastric Tube
1	2 - 5kg	N/A
1 1/2	5 - 12kg	10 FG
2	10 - 25kg	12 FG
2 1/2	25 - 35kg	12 FG
3	30 - 60kg	12 FG
4	50 - 90kg	12 FG
5	> 90kg	14 FG



# Endotracheal Intubation Guide

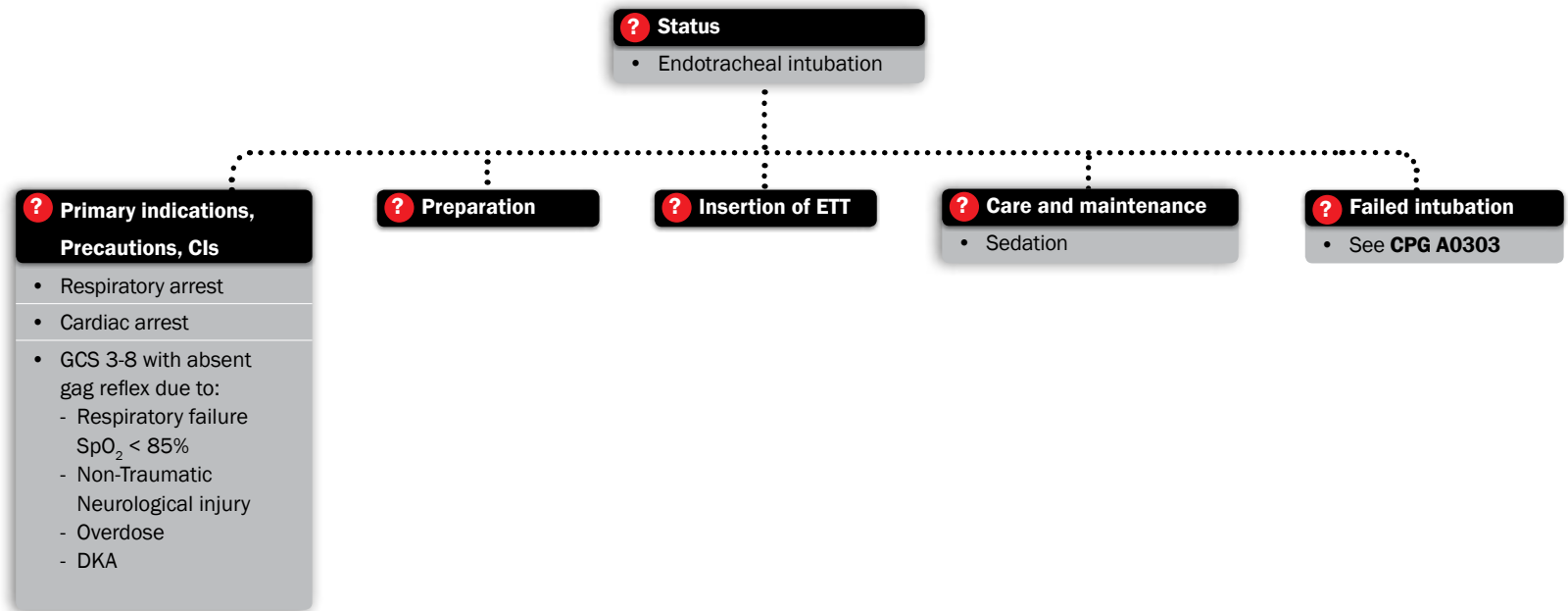
**CPG A0302**

## Special Notes

- All intubations facilitated or maintained with drug therapy will be reviewed as part of AT Clinical governance processes.

# Endotracheal Intubation Guide

## CPG A0302



# Endotracheal Intubation Indications, Precautions, CIs

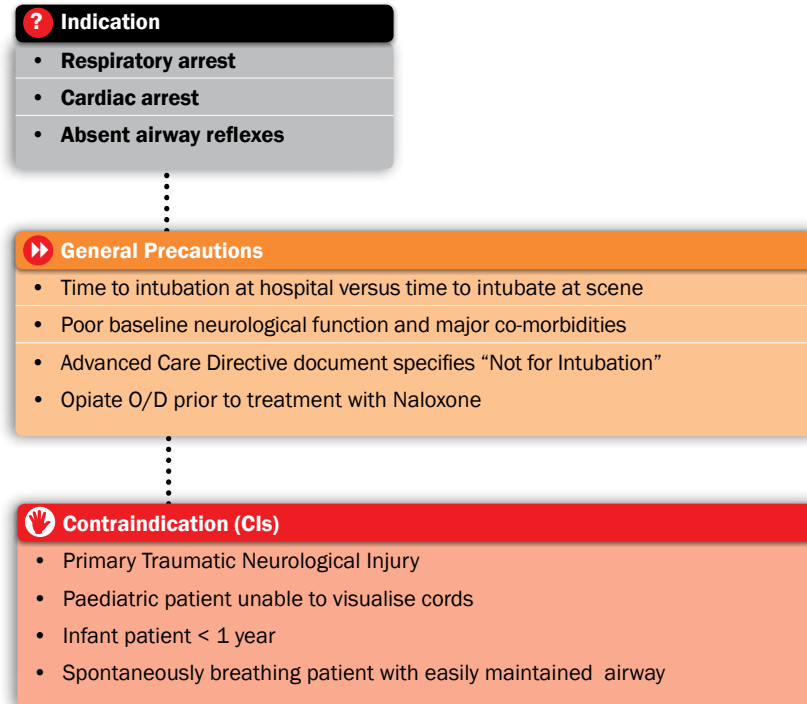
**CPG A0302**

## Special Notes

- **Uncontrolled bleeding**
  - Airway management with BVM is to be maintained in conjunction with prompt transport. Intubation (without drugs) should be considered if airway reflexes are lost, bearing in mind the risks of delay to definitive surgical care.

# Endotracheal Intubation Indications, Precautions, CIs

## CPG A0302



# Endotracheal Intubation Preparation

## CPG A0302

### ? General preparation for intubation

#### ✓ Action

- Position Pt, if a cervical collar is fitted it should be opened while maintaining manual cervical support
- Pre-oxygenate with 100% O<sub>2</sub>
- Attach capnography, pulse oximeter and cardiac monitor
- Ensure all monitoring is functional
- Prepare equipment
  - Suction
  - ETT (plus one size smaller than predicted immediately available) with AT approved introducer
  - Oesophageal Detector Device (ODD).
  - Ensure equipment for a difficult / failed intubation is immediately available, including bougie, Supraglottic Airway, cricothyroidotomy kit
  - Mark cricothyroid membrane as necessary
  - Brief assistant to provide cricoid pressure, where appropriate
  - If suspected spinal injury or traumatic head injury, intubate using Supraglottic Airway.
- Ensure patency and secure IV access

# Endotracheal Intubation Insertion of ETT

## CPG A0302

### Insertion of Endotracheal Tube

- Observe passage of ETT through cords noting AS standard markings and grade of view.
- Check ETT position using Oesophageal Detector Device (ODD)
- Inflate cuff.
- Confirm tracheal placement via capnography (note: Pt in cardiac arrest may not have CO<sub>2</sub> initially detectable).
- Exclude right main bronchus intubation by comparing air entry at the axillae.
- Note length of ETT at lips / teeth.
- Auscultate chest / epigastrium.
- Note supplemental cues of correct placement (e.g. tube "misting", bag movement in the spontaneously ventilating Pt, improved oxygen saturation and colour).
- Secure the ETT and insert a bite block.
- **If there is ANY doubt about tracheal placement, the ETT must be removed.**
- If unable to intubate after ensuring correct technique and problem solving then proceed to **CPG A0303 Failed Intubation Drill.**

### General Care of the Intubated Pt

- Reconfirm tracheal placement using EtCO<sub>2</sub> after every Pt movement. Disconnect and hold ETT during all transfers.
- Suction ETT and oropharynx in all Pt's. Caution with neurologically injured patient due to possible increase in intracranial pressure.
- If time permits, insert orogastric or nasogastric tube. The orogastric tube must be used in head or facial trauma.
- Ventilate using 100% oxygen and tidal volume of 7 ml/kg. Aim to maintain SpO<sub>2</sub> > 94% and EtCO<sub>2</sub> @ 35 - 40mmHg (except asthma / COPD where a higher EtCO<sub>2</sub> is acceptable, tricyclic OD where the target is 25 - 30mmHg, and DKA where the EtCO<sub>2</sub> should be maintained at the level detected immediately post-intubation, with a min. of 25mmHg).
- Document all checks and observations made to confirm correct ETT placement.

# Endotracheal Intubation Insertion of ETT

## CPG A0302

### ▶▶ Status

- Insertion / General care of ETT

### ? Insertion and checks of ETT

#### ✓ Action

- ODD
- Capnography - EtCO<sub>2</sub>
- Length lips / teeth
- Auscultate chest / epigastrium
  - Chest rise and fall, bag movement, SpO<sub>2</sub>, wave capnography, tube misting
- Specific insertion instructions as per Insertion of Endotracheal Tube



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

### ? General care / ventilation

#### ✓ Action

- Disconnect and hold ETT during transfers
- ETT checks with each Pt movement
- Provide circulatory support if hypotension present
- Ensure wave capnography is being captured at all times
- Suction ETT and oropharynx when necessary
- Insert OG/NG tube, if time permits
- Ventilate V<sub>T</sub> 7ml / per kg, EtCO<sub>2</sub> 35 - 40mmHg appropriate to Pt condition
- Specific instructions as per General Care of the Intubated Pt

# Endotracheal Intubation Insertion of ETT

# CPG A0302

## Special Notes

- For patients who become hypotensive after intubation consider additional fluids and/or **Adrenaline** infusion according to clinical context. If hypotension persists consider reducing the sedation dose while closely monitoring the patient for signs of under-sedation.
- When utilising bolus doses start at the lower amount and escalate dosing according to clinical response
- Bolus dosing is intended to be only utilised when sedation is required while preparing for an infusion, while escalating infusion dosing or if an infusions is unavailable.
- Bolus doses are written as the same preperation and concentration as the infusion preperation.

## General Care of the Intubated Pt

### • Post intubation Infusions

#### - Morphine 10mg + Midazolam 10mg in 10ml normal saline

= 1mg Morphine / 1mg Midazolam in 1 ml

= 1ml/hr = 1mg/hr

#### - Fentanyl 100mcg + Midazolam 10mg in 10ml normal saline

= 10mcg Fentanyl / 1mg Midazolam in 1 ml

= 1ml/hr = 10mcg/1mg/hr

### • Handover

The ETCO<sub>2</sub> and respiratory wave-form immediately prior to patient handover must be demonstrated to the receiving physician and documented on the ePCR



- Does Pt require sedation to maintain intubation and ventilation

- ## ▶▶ Post Intubation Sedation
- Restlessness / signs of under sedation in the absence of other noxious stimuli
    - e.g. ETT too deep / irritating, occult pain
  - Signs of inadequate sedation
    - HR and BP trending up together
    - Lacrimation
    - Diaphoresis
    - Cough / Gag/ Movement

- The ETT must be secured and tracheal placement reconfirmed with electronic capnography

- ❓ **Sedation**
  - ✔️ **Action**
    - **Morphine/Midazolam infusion 1-10mg/1-10 mg /hr IV**

**OR**

  - **Fentanyl/Midazolam infusion 10-100mcg/1mg -10mg /hr IV**

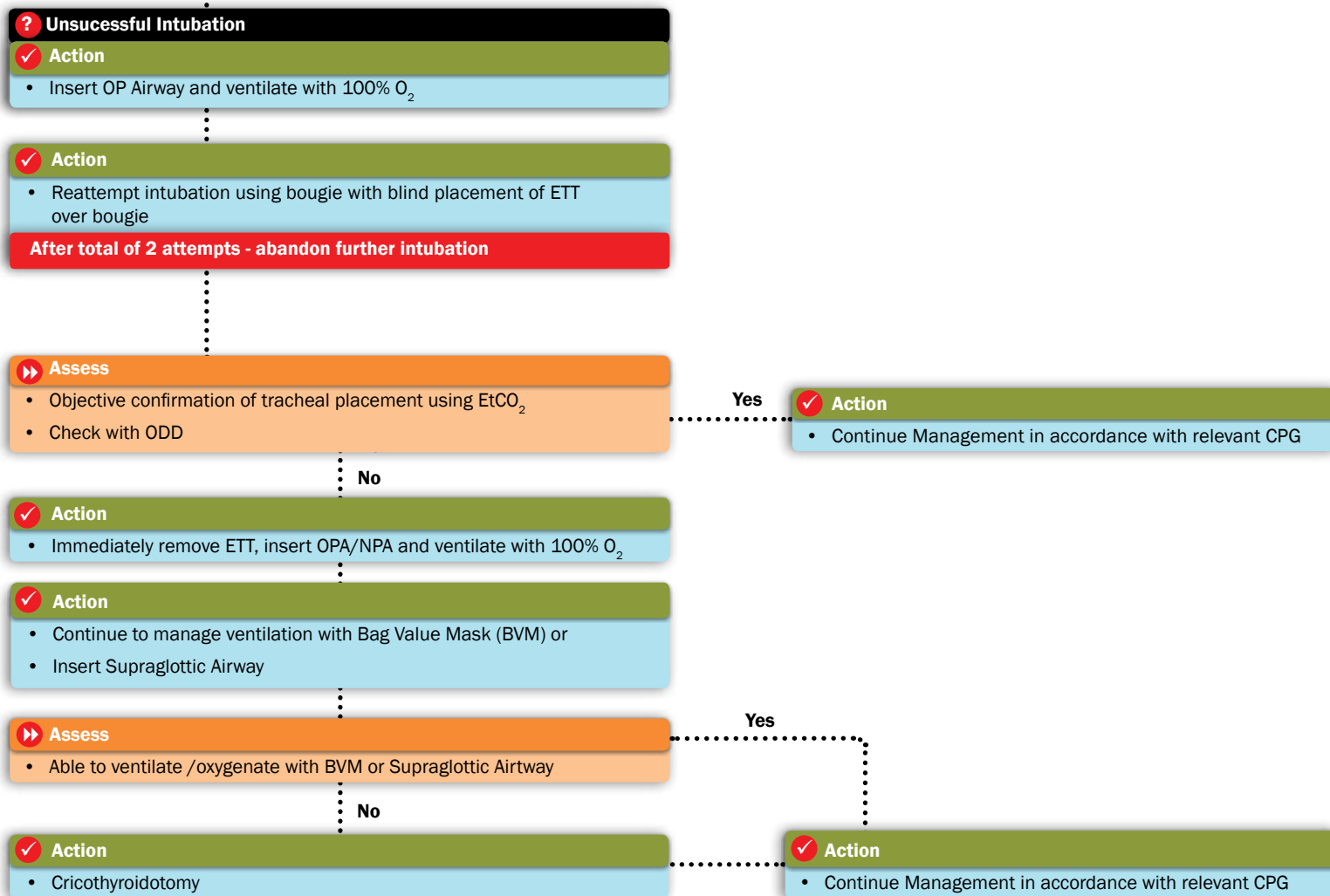
**Until sedation infusion established or as required**

  - **Morphine/Midazolam 0.5mg-5mg IV** each drug as required, **OR**
  - **Fentanyl/Midazolam 5mcg-50mcg/0.5mg-5mg IV** as required

- | 1 ? Status | 2 Stop | 3 Assess | 4 Consider | 5 Action | 6 ICP Action |
|------------|--------|----------|------------|----------|--------------|
|            |        |          |            |          |              |

# Failed Intubation Drill

## CPG A0303



# Cricothyroidotomy

## CPG A0304

### ? Status

- Unconscious Pt unable to be oxygenated and ventilated using Bag and Mask, OP/NP airway, LMA or ETT where:
  - Upper airway obstruction is present due to a pharyngeal or an impacted foreign body which is unable to be removed using manual techniques and Magill forceps
  - Massive facial trauma where intubation is considered unsafe
  - Unsuccessful Intubation as per **CPG A0303 Failed Intubation Drill**

### Stop

#### • Contraindications

- Nil in circumstances where oxygenation and ventilation are not possible using alternative techniques.

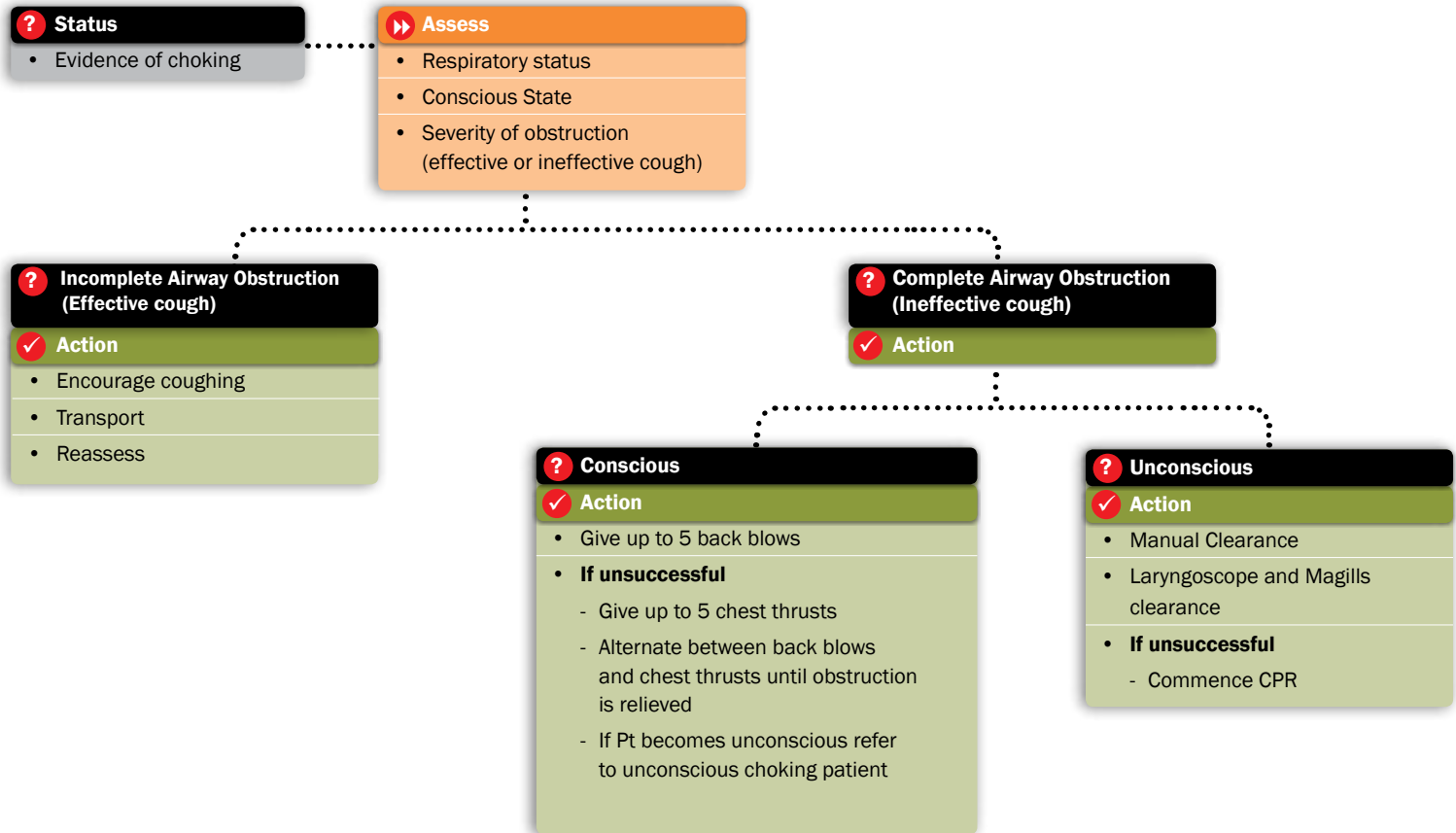
### ✓ Action

- Perform Cricothyroidotomy using approved equipment.



# Foreign Body Choking

## CPG A0305













# Acute Coronary Syndrome

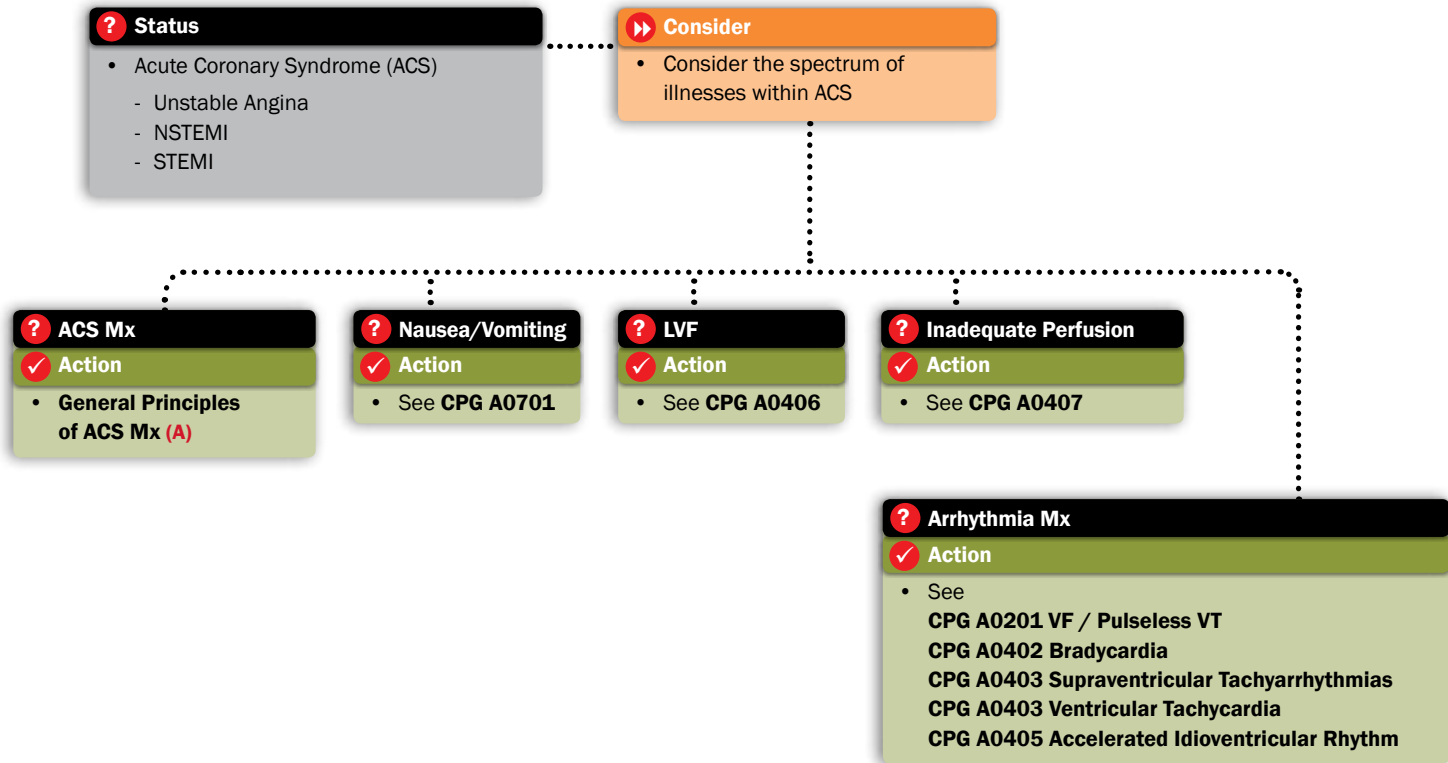
## CPG A0401

### Special Notes

- Acute Coronary Syndrome (ACS) is a spectrum of illnesses including:
  - Unstable Angina
  - Non-ST Elevation Myocardial Infarction (NSTEMI)
  - ST-Elevation Myocardial Infarction (STEMI)
- Not all Pts with ACS will present with pain, e.g. diabetic Pts, atypical presentations, elderly Pts.
- The absence of ischaemic signs on the ECG does not exclude AMI. AMI is diagnosed by presenting history, serial ECGs and serial blood enzyme tests.
- Suspected ACS related pain that has spontaneously resolved warrants investigation in hospital.
- The IM route of administration is relatively contraindicated in ACS if Pt is eligible for thrombolysis.
- Current evidence suggests transport to a PCI-enabled facility improves Pt outcomes in STEMI transport time < 90 mins.
- A goal of management in ACS is to achieve pain control if safe to do so. This reduces Cardiac workload.

# Acute Coronary Syndrome

## CPG A0401



# Acute Coronary Syndrome General Management Principles

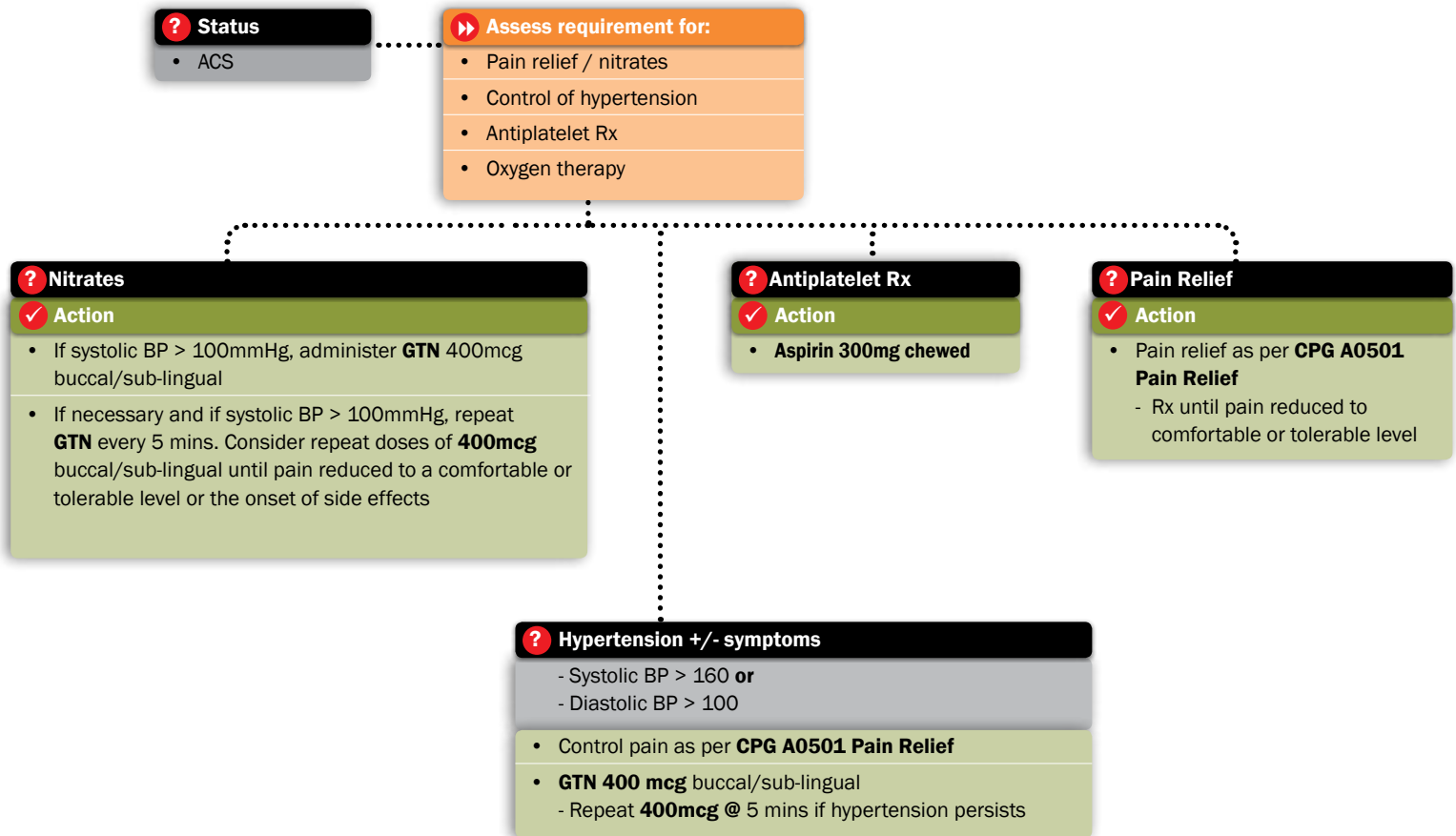
## CPG A0401

### Special Notes

- **GTN** is a potent venodilator that can decrease venous return therefore decreasing right ventricular (RV) filling and fibre stretch with a reduction in cardiac output.
- Up to 50% of Inferior AMIs have RV involvement and cannot compensate to a drop in venous return due to myocardial insufficiency.
- Signs of an Inferior AMI include ST elevation in leads II and III. Bradycardia is not unusual in an Inferior AMI due to the involvement of the right coronary artery and the SA / AV nodes.
- Nitrates are contraindicated in bradycardia (HR < 50) due to the Pt's inability to compensate to a decrease in venous return by increasing HR to improve cardiac output.
  - $C.O. = HR \times SV$

# Acute Coronary Syndrome General Management Principles

## CPG A0401



# Bradycardia

# CPG A0402

## Special Notes

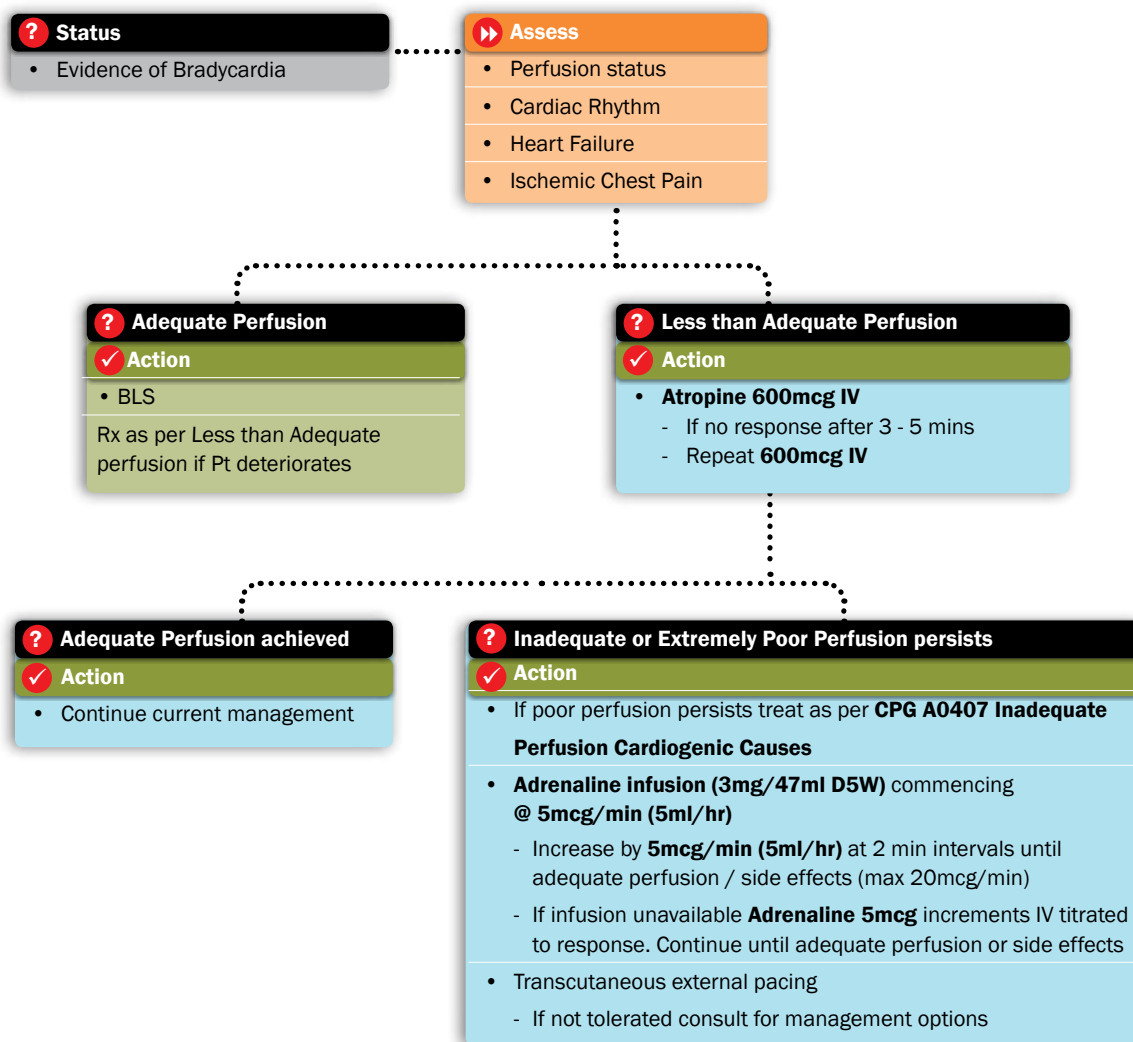
- Bradycardia is defined as a heart rate of < 60 bpm in adults. It may be normal in some patients and is rarely symptomatic until heart rate is < 50 bpm. Management is determined by the evidence of less than adequate perfusion.
- **Atropine** is unlikely to be effective in complete heart block.
- If extremely poorly perfused and not responding to **Atropine** and **Adrenaline** treat with external pacing if available.
- Pacing may be considered for first line management in some situations (e.g. rapidly deteriorating patient or heart blocks)
- Notify appropriate hospital capable of managing a Pt likely to require pacing.

## General Care

- **Adrenaline** Infusion
  - **3mg Adrenaline** added to **47ml D5W** = **60mcg/ml**  
Infusion rate **5ml/hr** = **5mcg/min**.
- If no response from **Adrenaline** infusion @ **20mcg/min**, increasing infusion rate is unlikely to have additional chronotropic effects.
- If no response to **Adrenaline** commence **Transcutaneous Pacing**.
- When commencing **Transcutaneous Pacing**, initial rate should be no greater than double the initial intrinsic rate.
- Pacing should be initial commenced in 'demand' mode unless artefact or inconsistent capture is encountered
- Initial milliamps should be started between 30-40mA and increased as required.

# Bradycardia

## CPG A0402



# Tachyarrhythmias - incl. SVT & VT (Adult)

**CPG A0403**

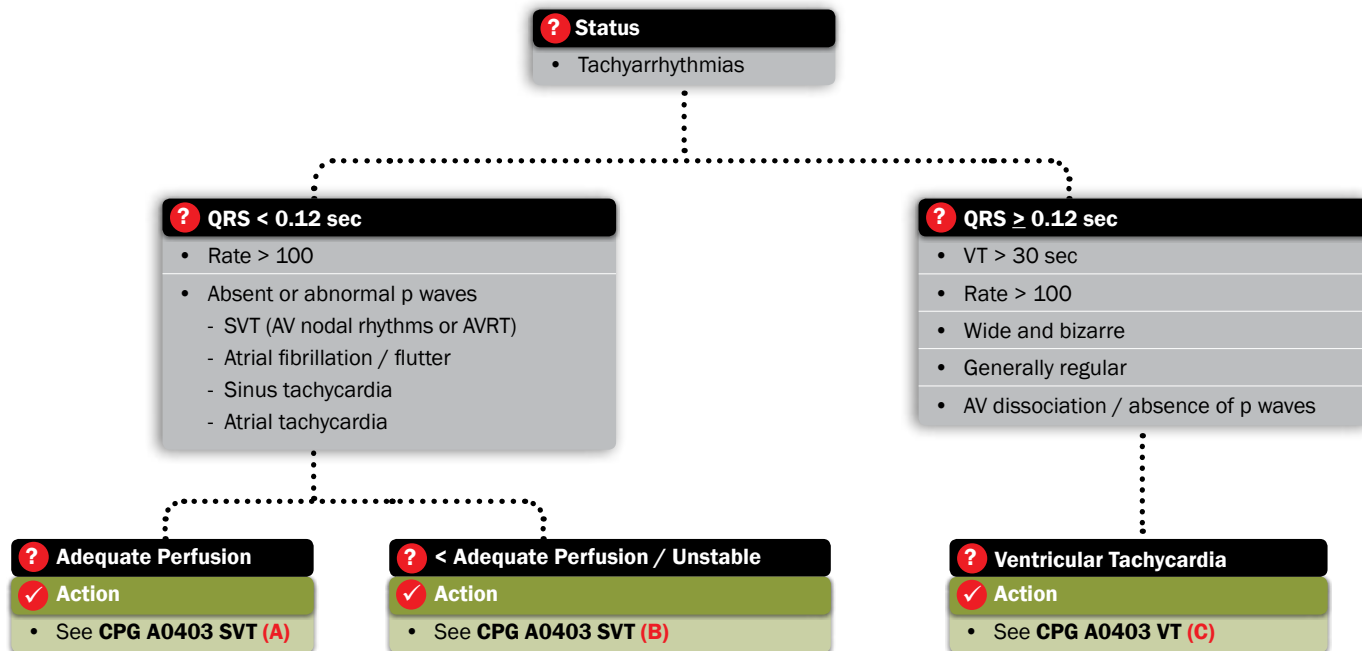
## Special Notes

- Narrow complex tachycardia is defined as a heart rate of > 100 bpm with a QRS width less than 0.12 seconds.
- Narrow complex tachycardia can have a cardiac or non-cardiac aetiology.
- Broad complex tachycardia is defined as a heart rate of >100 bpm with a QRS equal to or greater than 0.12 seconds. Ventricular tachycardia is one form of broad complex tachycardia.
- AIVR is defined as having a rate of up to 110 bpm.
- Treatment of patients with a broad complex tachycardia with a rate between 100 -110 bpm must be guided by the clinical scenario and patient presentation.



# Tachyarrhythmias - incl. SVT & VT (Adult)

## CPG A0403



# Supraventricular Tachyarrhythmias (SVT)

## CPG A0403

### Special Notes

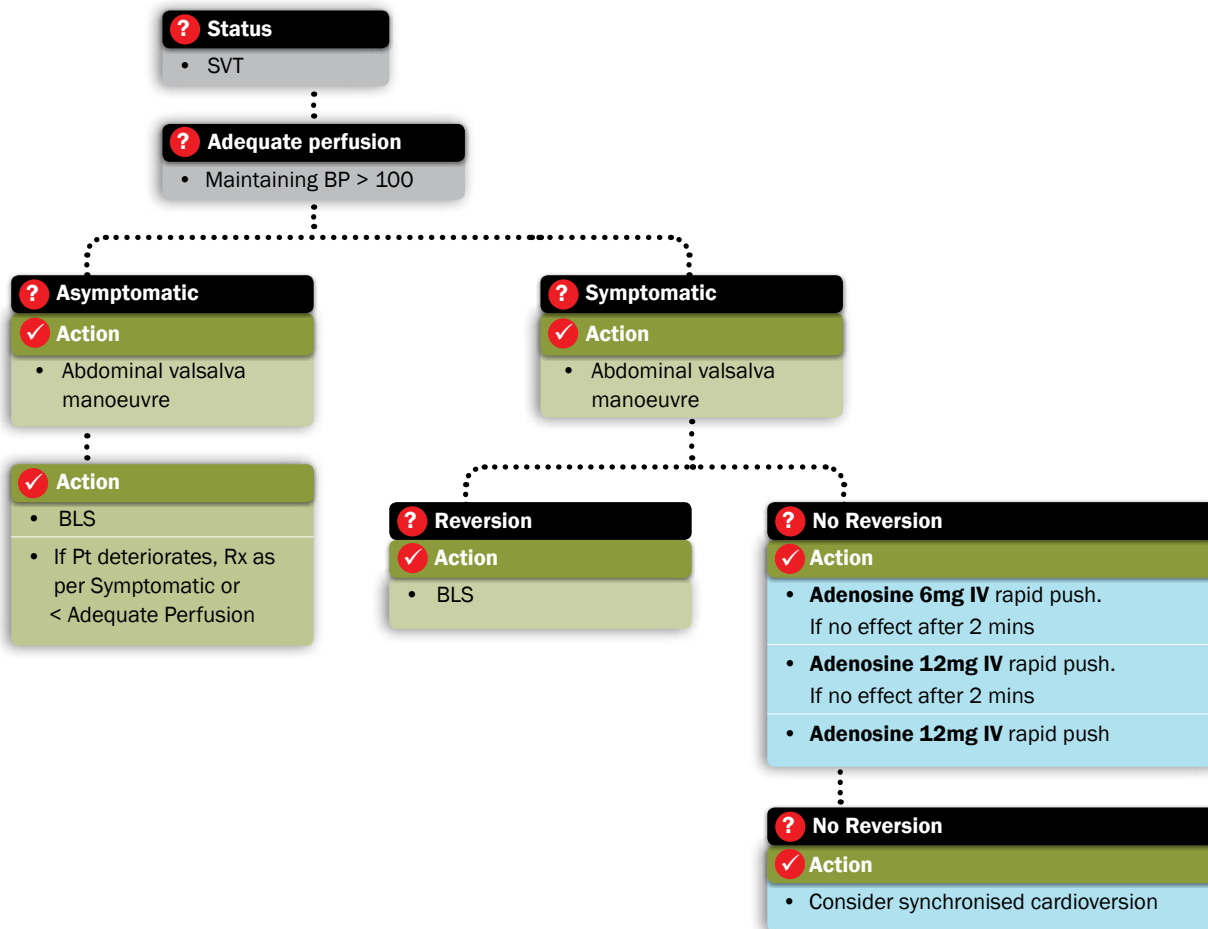
- **Symptomatic signs and symptoms**
  - Rate related severe or persistent chest pain
  - Shortness of breath with crackles
- **IV Adenosine** requires rapid Sodium Chloride 20ml flush
- **IV Adenosine** doses should be halved in patients taking Dipyridamole or Carbamazepine, or who have received a heart transplant
- Ensure to press "sync" button on the defibrillator before performing Synchronised Cardioversion

### General Care

- **Valsalva instruction**
  - Evidence suggests a greater reversion rate with an abdominal valsalva manoeuvre with the following 3 elements.
- 1. Position
  - Supine
- 2. Pressure
  - At least 40mmHg for max. vagal tone. Best achieved with Pt blowing into a 10ml syringe hard enough to move the plunger to create this pressure.
- 3. Duration
  - At least 15sec if tolerated by Pt

# Supraventricular Tachyarrhythmias (SVT)

CPG A0403 (A)



# Supraventricular Tachyarrhythmias (SVT)

## CPG A0403

### Special Notes

- A Pt eye opening to pain but not to voice commands would also be likely to be making incomprehensible sounds and making purposeful movements in response to pain. i.e. a GCS of 9, (E2, V2, M5). Sedation should be used cautiously in these Pts.
- The effectiveness of the Pt's respirations should be continuously monitored.
- Ensure to press "sync" button on the defibrillator before performing Synchronised Cardioversion

### General Care

- If wide complex QRS or unsure of diagnosis treat as for **CPG A0403 Ventricular Tachycardia**.
- Treat Pt symptomatically in accordance with appropriate Guideline and transport for further assessment and treatment.
- If Pt is unconscious or becomes unconscious at any time during treatment, perform immediate synchronised cardioversion.

# Supraventricular Tachyarrhythmias (SVT)

CPG A0403 (B)

## ? Status

- If inadequate perfusion with altered conscious state and deteriorating rapidly and / or unresponsive to **Adenosine**

## ? Unstable

- Rapidly deteriorating, altered conscious state

## ? Unstable / rapidly deteriorating

### ✓ Action

- If sedation required **Midazolam 2mg IV** over 1min.  
Repeat **1mg** @ 2 min intervals until pt does not respond to verbal stimuli but does respond to pain (**max. 5mg**)
- Synchronised Cardioversion (*Ensure to 'activate the synchroniser' and it is functioning effectively while preparing airway & ventilation equipment.*)
  - Biphasic: 100J
- If successful, reassess clinical status
- If unsuccessful repeat cardioversion, if required
  - Biphasic: 200J
- If still unsuccessful, medical consult
- If another rhythm develops at any stage or Pt becomes pulseless, treat as per appropriate Clinical Practice Guideline

## ? Reversion

### ✓ Action

- BLS

## ? Loss of Output

### ✓ Action

- As per appropriate CPG

# Ventricular Tachycardia (VT)

## CPG A0403

### Special Notes

- **Unstable signs and symptoms:**
  - Congestive cardiac failure
  - Systolic BP < 80mmhg
  - GCS < 13
  - Rapidly deteriorating
- A Pt. eye opening to pain but not to voice commands would also be likely to be making incomprehensible sounds and making purposeful movements in response to pain, i.e. a GCS of 9, (E2, V2, M5). Sedation should be used cautiously in these Pts.
- The effectiveness of the Pt's respirations should be continuously monitored.
- Preference for anterior / posterior pad placement.
- If runs of VT associated with underlying Bradycardia treat as per **CPG A0402 Bradycardia**.
- Sedation should be considered where possible but should not delay cardioversion. The Pt's conscious level and haemodynamic stability will guide the need for sedation.
- Ensure to press "sync" button on the defibrillator before performing Synchronised Cardioversion

### General Care

- Consider ICP support as these Pts are dynamic and have a potential to deteriorate but do not delay transport.
- Pt presenting symptomatic and poorly perfused is likely to require sync. cardioversion prior to **Amiodarone** administration.

#### • Amiodarone infusion

- **Amiodarone 5mg/kg (max 300mg)** diluted with required volume of **D5W to make 50ml (6mg/ml)** run over **20 mins**.

#### Amiodarone infusion example

40kg	=	200mg
50kg	=	250mg
60kg	=	300mg
> 60kg	=	300mg

# Ventricular Tachycardia (VT)

CPG A0403 (c)

## ? Status

- Confirm Ventricular Tachycardia
  - VT > 30sec.
  - QRS  $\geq$  0.12sec.
  - Rate > 100
  - Mostly regular
  - A-V dissociation / absence of p waves

## Stop

- Do not administer Amiodarone if suspected Tricyclic Antidepressant Medication Overdose

## ? Torsade de Pointes

### ✓ Action

- Magnesium infusion 2g IV over 10 mins**
  - Repeat once after **10mins** if nil or poor response.
- If patient becomes unstable, consider Cardioversion/Defibrillation as indicated

## ? Stable

### ✓ Action

- Amiodarone infusion 5mg/kg IV (max. 300mg) over 20 mins** once only
- Rx as per Unstable if Pt deteriorates



**Only dilute Amiodarone with D5W**

## ? Unstable

### ✓ Action

- If sedation required **Midazolam 2mg IV** over 1min. Repeat **1mg** @ 2 min intervals until pt. does not respond to verbal stimuli but does respond to pain (**max. 5mg**)
- Perform Synchronised Cardioversion (*Ensure to 'activate the synchroniser' and it is functioning effectively while preparing airway & ventilation equipment.*)
  - Commence with **100J** (Biphasic)
  - If unsuccessful, repeat using **200J** (Biphasic)

## ? Reversion

### ✓ Action

- Narrow complex
  - **Amiodarone infusion** as above (if not already running)
- Other rhythms
  - Rx as per appropriate CPG

## ? Loss of Output

### ✓ Action

- As per appropriate CPG

# Accelerated Idioventricular Rhythm (AIVR)

**CPG A0405**

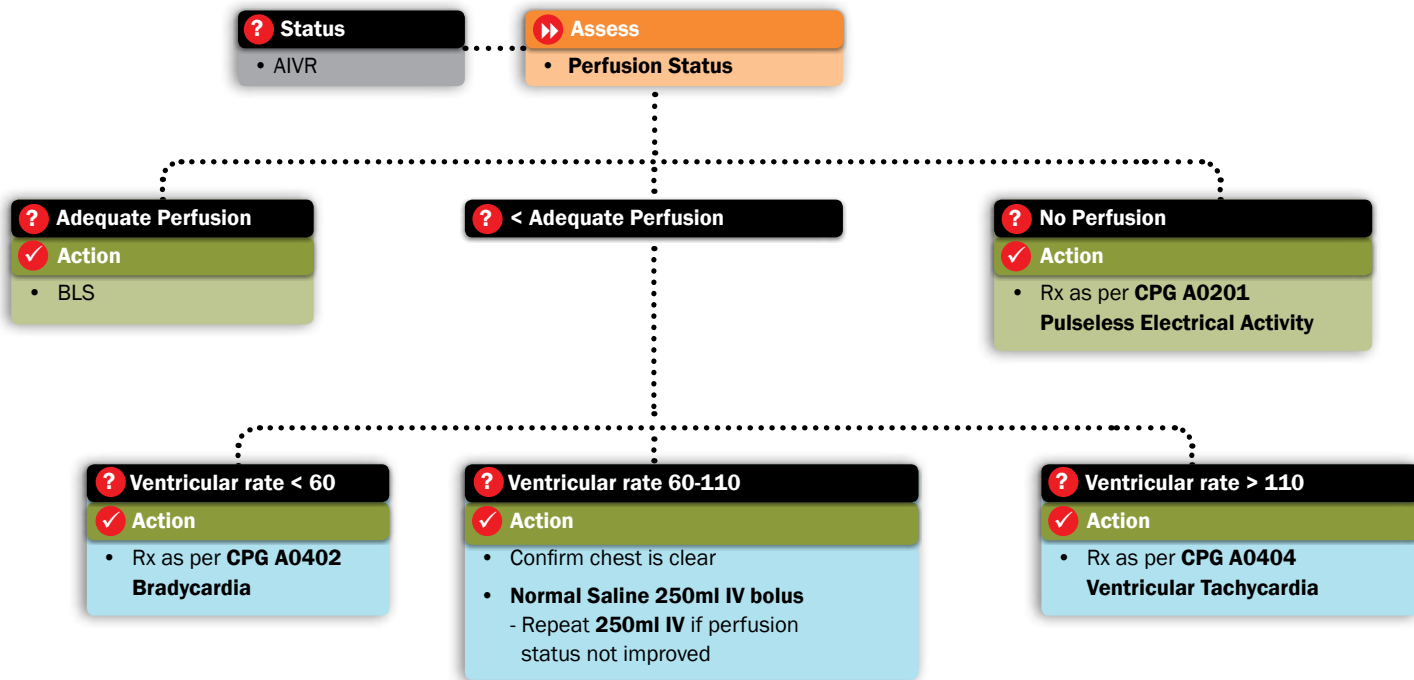
## Special Notes

- AIVR is usually a benign rhythm but may be associated with AMI, reperfusion or drug toxicity.
- Commonly seen in post cardiac arrest Pts.
- May be associated with **Adrenaline** administration.



# Accelerated Idioventricular Rhythm (AIVR)

## CPG A0405



# Pulmonary Oedema

## CPG A0406

### Special Notes

- Pts with pulmonary oedema may present with wheezes. Pts should only be managed as per **CPG A0601 Asthma** if a history of bronchospasm can be confirmed. Avoid the use of **Salbutamol** in the setting of pulmonary oedema where possible.
- Pulmonary oedema is a clinical syndrome resulting from a range of causes both cardiac and non cardiac. The guideline is primarily directed at cardiogenic pulmonary oedema secondary to left ventricular failure which is the most common cause.
- Other medical causes of pulmonary oedema such as liver disease, renal disease, nutritional deficiency and fluid overload would be treated using the guideline.
- Non medical causes may be due to altered alveolar permeability, e.g. inhalation of smoke or toxic gases, near drowning, aspiration and anaphylaxis. Those Pts should be primarily treated with oxygen therapy, assisted ventilation and if wheeze is present treated as per **CPG A0601 Asthma**
- **Morphine** is no longer indicated to control anxious/combative pulmonary oedema patients.
- Manage chest pain as per **CPG A0401 Acute Coronary Syndrome**.
- **Furosemide** to be considered only in cases of suspected fluid overload.

### GTN Infusions

- A GTN infusion is only to be commenced in conjunction with CPAP
- Dramatic changes in Blood Pressure are possible so constant and regular blood pressure monitoring should occur every 5-10mins in the arm opposite to the infusion.
- 80% of the active agent may be absorbed by the PVC giving sets. Absorption also increases with high concentration and over time.
- Carefully use titrated doses to achieve the desired clinical effect

### GTN Infusion Preparation and Administration

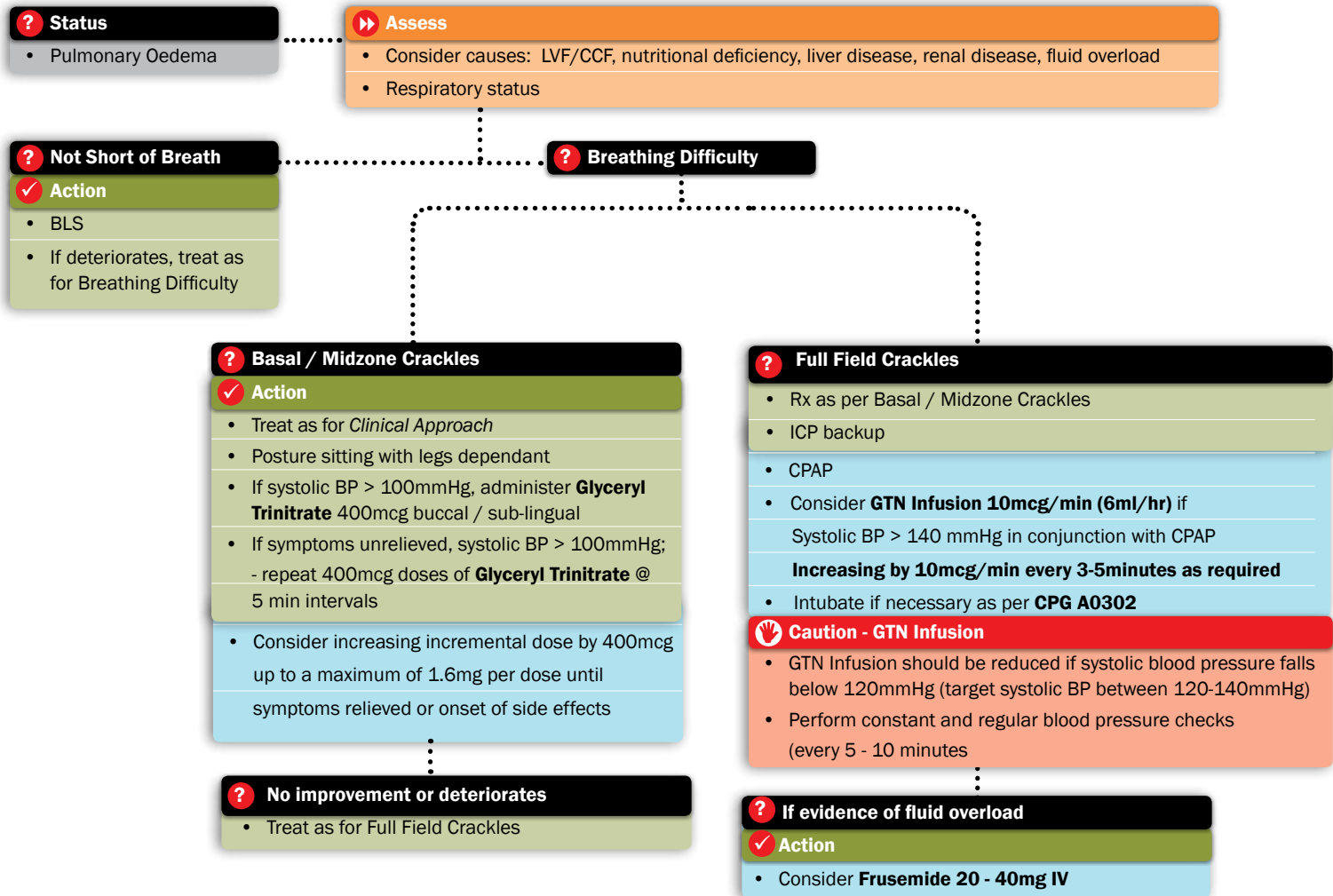
- Should only be commenced in conjunction with CPAP and Systolic BP >140mmHg
- Use Glyceryl Trinitrate 50mg in 10ml Ampoule  
Dilute 10mg (2ml) of GTN into a 100ml bag of 5% Dextrose. Subsequently drawing off 50ml in a syringe making a solution of 5mg:50ml
- Commence infusion at 10mcg/min (6ml/hr)
- Increase by 10mcg/min (6ml/hr) every 3-5minutes according to response

Dose	Rate of Infusion
10 mcg/min	6 ml/hr
20 mcg/min	12 ml/hr
30 mcg/min	18 ml/hr
40 mcg/min	24 ml/hr
50 mcg/min	30 ml/hr
60 mcg/min	36 ml/hr
70 mcg/min	42 ml/hr
80 mcg/min	48 ml/hr
90 mcg/min	54 ml/hr
100 mcg/min	60 ml/hr



### Caution - GTN Infusion

- GTN Infusions should be reduced if systolic blood pressure falls below 120mmHg (target systolic blood pressure 120-140 mmHg)
- In preparation avoid skin contact with concentrated solution



# Inadequate Perfusion Cardiogenic Causes

**CPG A0407**

## Special Notes

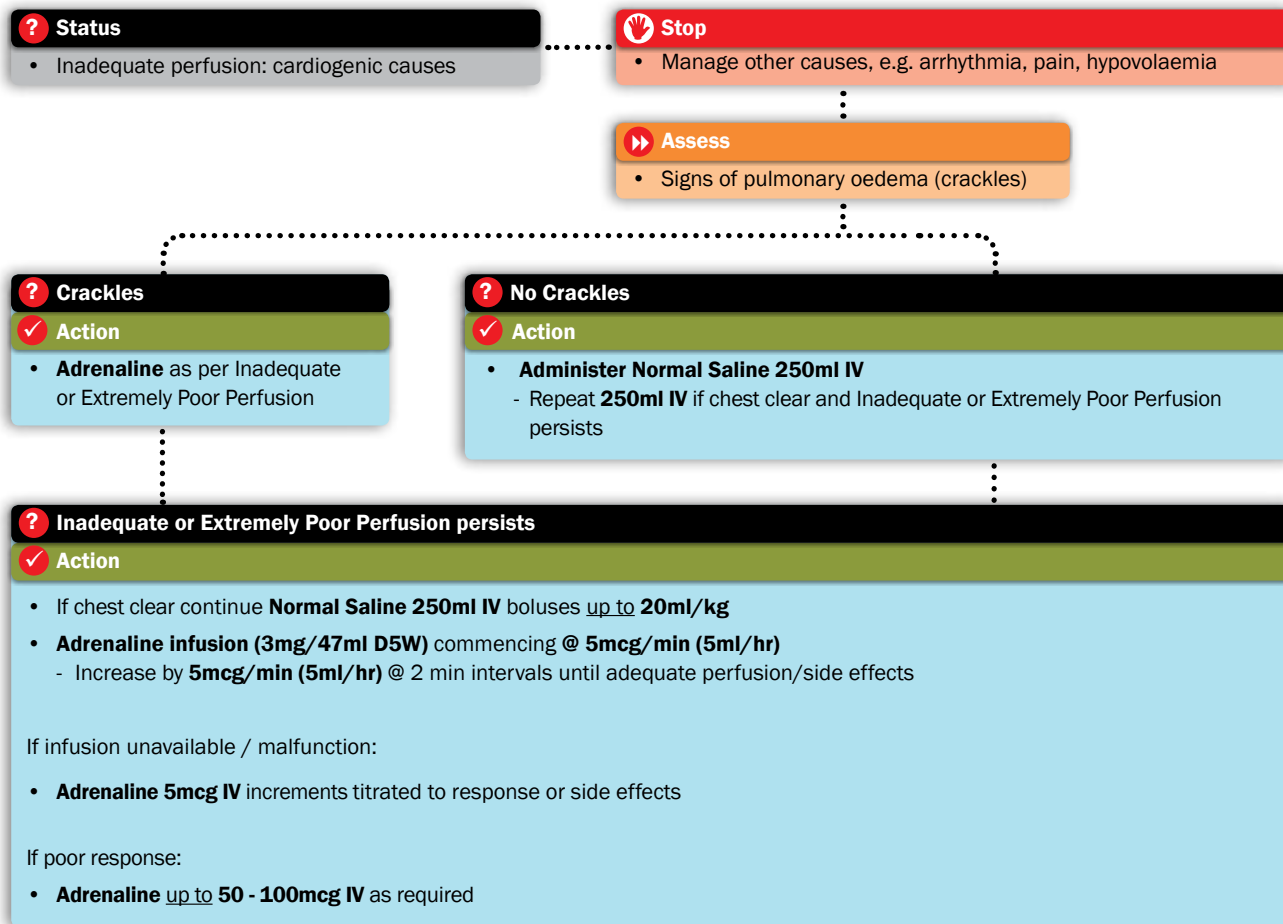
- A Pt presenting with inadequate to extremely poor perfusion resulting from a cardiac event may not always have associated chest pain, e.g. silent myocardial infarction, cardiomyopathy.
- Pts presenting with suspected pulmonary embolus with inadequate to extremely poor perfusion should be managed with this Guideline. Pulmonary embolus is not specifically a cardiac problem but may lead to cardiogenic shock due to an obstruction to venous return and the Pt may require fluid and **Adrenaline** therapy.

## General Care

- **Adrenaline infusion**
  - **3mg Adrenaline** added to **47ml D5W** = **60mcg/ml**
  - Infusion rate **5mls/hr** = **5mcg/min.**

# Inadequate Perfusion Cardiogenic Causes

## CPG A0407













# Pain Management

# CPG A0501

## Special Notes

- Specific indications for **Fentanyl**:
  - Contraindication to morphine
  - Short duration of action desired (e.g. dislocations)
  - Hypotension
  - Nausea and / or vomiting secondary to previous morphine administration
- Fentanyl should be the narcotic drug of choice for the trauma Pt with less than adequate perfusion.
- Opioids are NOT to be administered to patients with migraines.
- Consider smaller doses of IV pain relief if the patient has previously been administered opioids
- BP, HR, Resp Rate and SpO2 is to be recorded initially and repeated after administering a dose of pain relief.
- The analgesic effect of Morphine IM or Fentanyl IM are slow and variable. This route must be used as a last resort.
- Once initial opioid loading has occurred (2-3 doses) the dose of Morphine or Fentanyl should be reduced and the time between doses doubled.
- If administering >20mg of Morphine or >200mcg Fentanyl, strong consideration should be given to consulting for advice with ongoing management
- Ketamine is indicated for pain as a result of fractures unrelieved by opioids (doses of >20mg Morphine or 200mcg Fentanyl), severe burns or short lived painful procedures e.g. extrication, splinting of fractures
- Emergence Reactions, hallucinations or other behavioural disturbances associated with Ketamine administration may be managed utilising small doses of Midazolam as per CPG.

## Stop

- Consider reducing narcotic doses for age and disease modifiers such as:
  - Pt Age >65
  - Shocked patients (Trauma or other)
  - Frail patients
  - Cardiovascular compromise
  - Underlying Lung disease or injury
  - Metabolism disorders (e.g. kidney or liver disease)
  - Any other condition the Paramedics clinical decision requires reduced doses or increased time between boluses.
- Narcotic pain relief must not be administered during labour.
- If respiratory depression occurs due to narcotic administration pt should be managed as per **CPG A0707 Management of Overdose**.

## Fentanyl IN Dosing Table

### Fentanyl IN 250mcg/1ml preparation

	Age < 65	Age > 65
Initial dose	100mcg	50mcg
<b>No. 25mcg Sprays</b>	<b>4</b>	<b>2</b>
Repeat doses	50mcg	50mcg
<b>No. 25mcg Sprays</b>	<b>2</b>	<b>2</b>

The current device utilised by Ambulance Tasmania delivers a metered dose of approx 25mcg per spray.

**Remember** - The actuator takes 4-5 'priming' depressions before atomization occurs.

# Pain Management

# CPG A0501

## ? Status

- Complaint of Acute Pain

## » Assess

- Determine need for Pain Relief
- BP, HR, Resp Rate & SpO2 to be recorded before EVERY dose
- Consider non-pharmacological management options as appropriate e.g. splinting, cold/heat therapy, position

## ⊘ Stop

- Exercise caution in patients with age and disease modifiers. Consider reduced doses and/or increases in dosing intervals.**

## ? Mild Pain

### ✓ Action

- Consider need for any pain relief
- If patient requests analgesia consider **Paracetamol 1000mg oral** if not already administered within past 4 hours.
- If pain not controlled or rapid pain relief required, consider treating as per Moderate pain

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

## ? Moderate Pain

### ✓ Action

- Consider **Paracetamol** as per Mild Pain relief
- IV Access Available:
- Morphine IV** or **Fentanyl IV** as per Severe Pain
- If IV access significantly delayed (>10mins) or unsuccessful:
- Fentanyl up to 100mcg IN (see IN Fentanyl dosing table)**
    - Repeat **up to 50mcg IN** after no less than **5 mins**, intervals titrated to pain or side effects (**total max. dose 400mcg**)

### OR

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

If unable to administer Fentanyl IN or Methoxyflurane:

- Morphine up to 0.1mg/kg (max single dose 10mg) IM/SC OR Fentanyl up to 1mcg/kg (max single dose 100mcg) IM/SC, repeated once if required** after no less than **20minutes**

## ? Severe Pain

### ✓ Action

IV/IO Access Available:

- Morphine up to 0.05mg/kg IV/IO (max 5mg)**  
Repeat after no less than **5 mins. (max. 20mg)** titrated to pain or side effects

### OR

- Fentanyl up to 0.5mcg/kg IV/IO (max 50mcg)**
  - Repeat after no less than **5 min**, titrated to pain or side effects (**max 200mcg**)

Consider reducing 2nd and all subsequent doses

If IV access delayed or unsuccessful, manage per Moderate Pain

Pain remains uncontrolled:

- Morphine IV/IO** or **Fentanyl IV/IO** as above - no maximum
- Repeat **doses should be no less than 10 mins** apart and half the bolus dose

## ? Fractures (Unresponsive to Opioids) Severe Burns or Procedures

### ✓ Action

- Consider **Ketamine up to 20mg IV**
  - Repeat up to **20mg IV / IO** every 2-3 mins titrated to pain or side effects to a total max of 1mg/kg
- Consider **Midazolam up to 0.5mg IV** for emergence following ketamine administration. Repeat **Midazolam up to 0.5mg IV / IO per minute as required (Max total 3mg)**

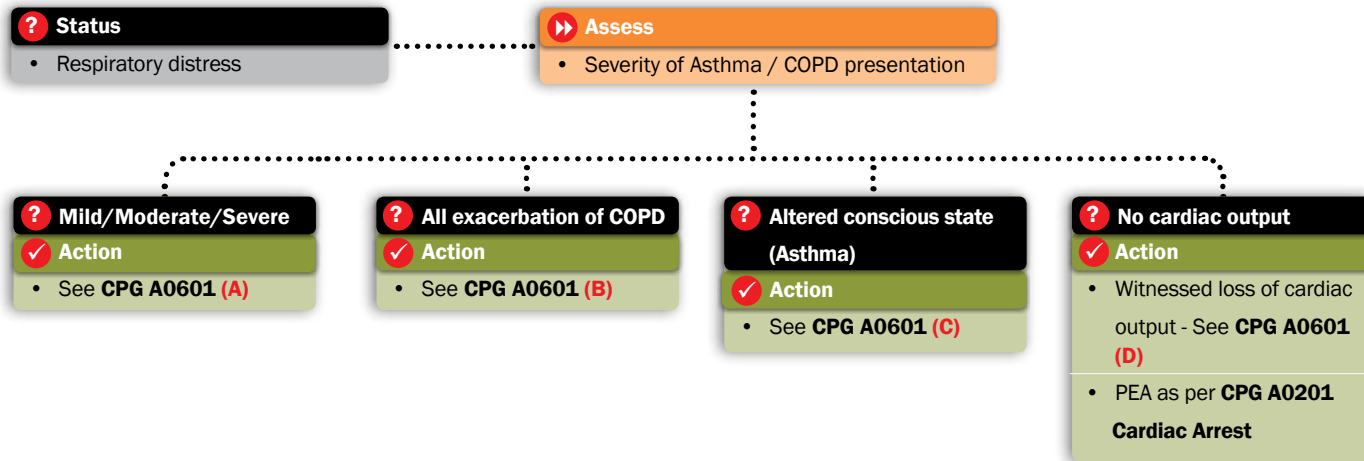






# Acute Bronchoconstriction (Asthma, COPD)

## CPG A0601



# Asthma

## CPG A0601

### Specialist Notes

- Asthmatic Pts are dynamic and can show initial improvement with treatment then deteriorate rapidly.
- Consider ICP support but do not delay transport waiting for backup.
- Despite hypoxaemia being a late sign of deterioration, pulse oximetry should be used throughout Pt contact (if available).
- An improvement in SpO<sub>2</sub> may not be a sign of improvement in clinical condition.
- Beware of Pt presenting with a wheeze associated with heart failure and no asthma / COPD Hx.
- pMDI = Pressurised Metered Dose Inhaler

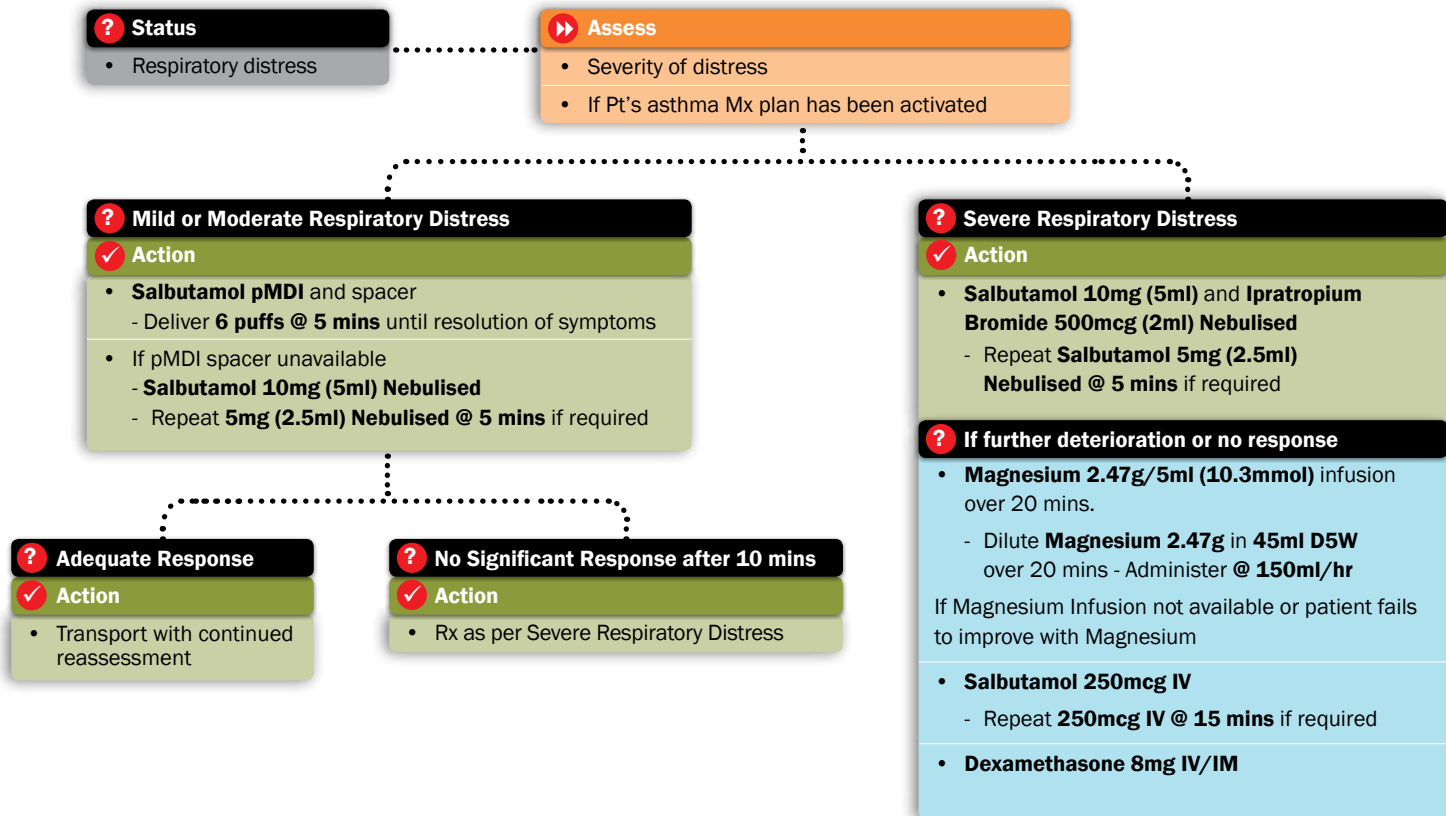
### General Care

- **Magnesium infusion**
  - **Magnesium 2.47g/5ml** diluted in **45ml D5W** given over 20 mins delivery rate 150ml/hr



# Asthma Mild/Moderate/Severe

## CPG A0601 (A)



# COPD Chronic Obstructive Pulmonary Disease

## CPG A0601

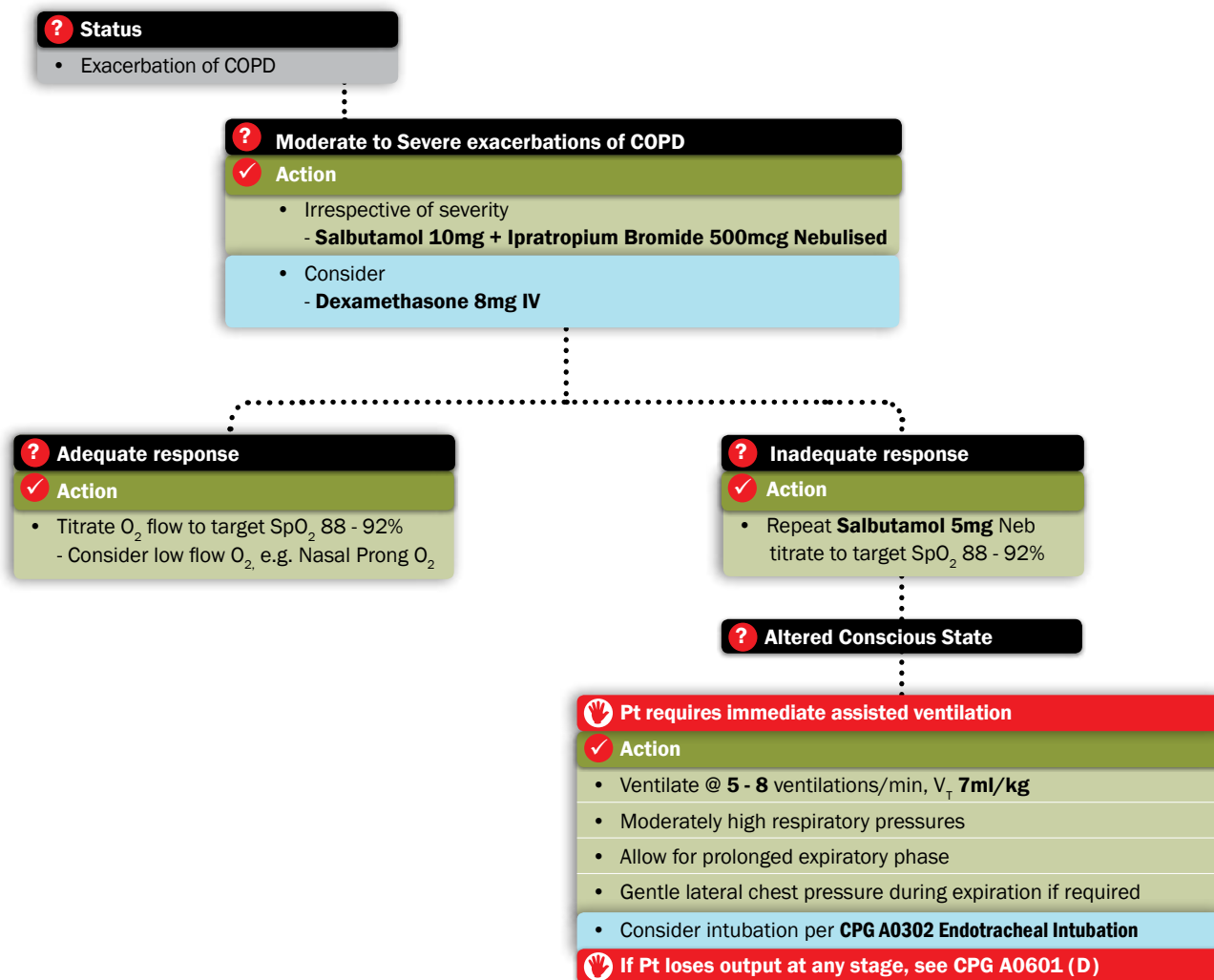
### Special Notes

- COPD Pts will often have significant cardiac disease. Therefore **IV Magnesium, IV Salbutamol** and **IM Adrenaline** should NOT be administered to these Pts.

### General Care

# COPD Chronic Obstructive Pulmonary Disease

## CPG A0601 (B)

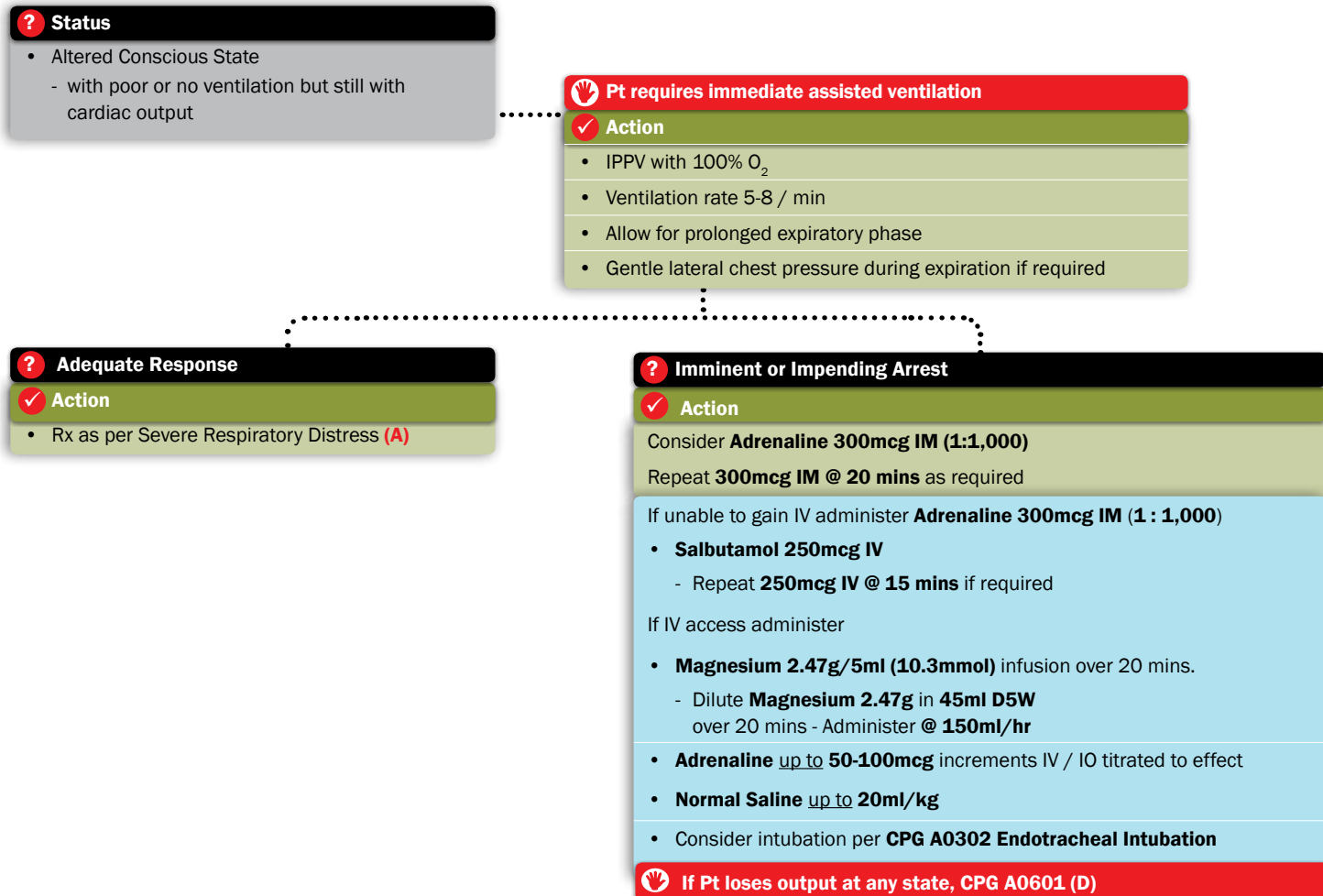


### Special Notes

- Extreme care is necessary when assisting ventilation in asthma. High positive pressures are necessary although severe bronchoconstriction, especially exhalation, causes gas trapping.
- High EtCO<sub>2</sub> levels should be anticipated in the asthmatic with altered conscious state. Pt. EtCO<sub>2</sub> levels of 120mmHg in this setting is considered safe and no attempt should be made to reduce this via increased ventilation except in the setting of severe persistent hypoxia.

# Asthma Altered Conscious State

## CPG A0601 (c)

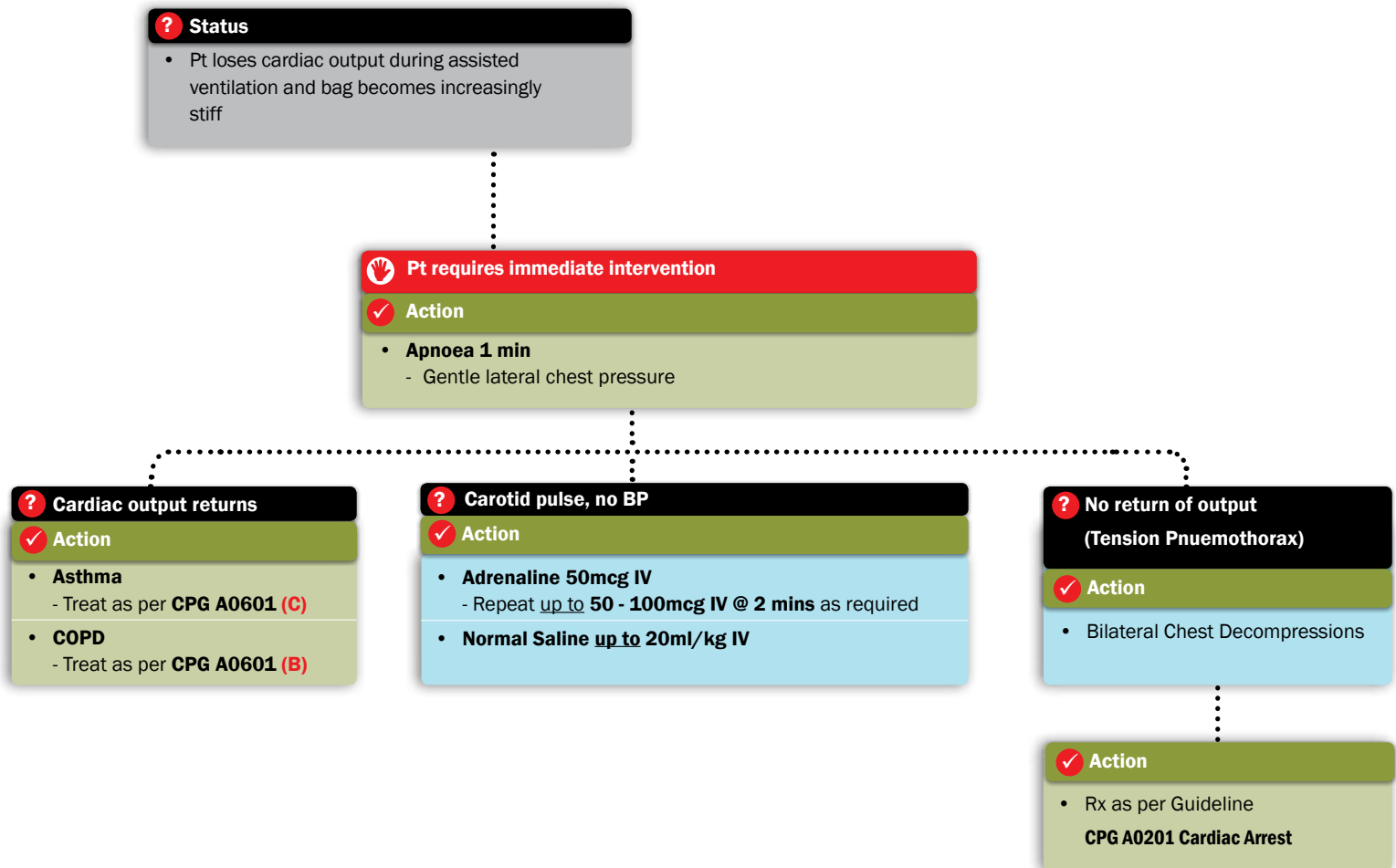


### Special Notes

- Positive Pressure Ventilation, via gas trapping, may generate progressively higher intrathoracic pressures. This reduces venous return and the patient may lose palpable cardiac output, resulting in Electro Mechanical Dissociation. Clinical differentiation between tension pneumothorax and high intrathoracic pressure at this point is clinically impossible to differentiate. One minute of apnoea may permit gas trapping to decrease slowly via elastic recoil, aided by gentle lateral chest thrusts with return of pulses. If after one minute of apnoea, ventilation remains difficult and no output is detectable, tension pneumothorax must be presumed present. Due to the difficulty in identifying the affected side, it is advised that bilateral chest decompression is performed.

# Asthma, COPD - No Cardiac Output

## CPG A0601 (D)













# Nausea and Vomiting

**CPG A0701**

## Special Notes

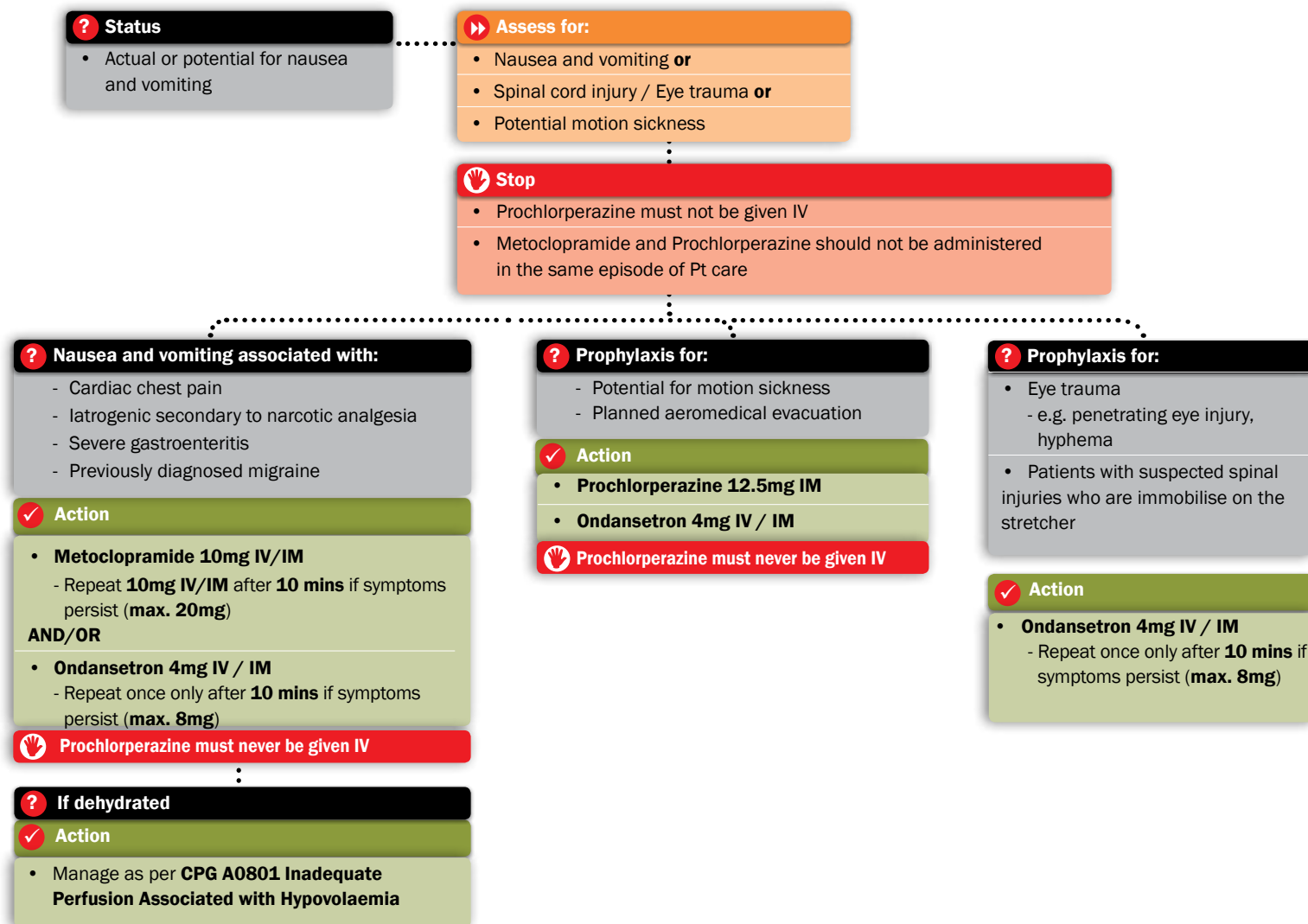
- **Prochlorperazine** must only be administered via the IM route. **Metoclopramide** and **Prochlorperazine** should not be administered in the same episode of Pt care.
- Antiemetics should never be administered if the Pt is suspected of having taken an oral drug overdose. This may increase the absorption of the ingested substance.
- **Ondansetron** is the preferred drug for Nausea and Vomiting secondary to cytotoxic drugs or radiotherapy
- **Metoclopramide is not to be given to pts < 16 years.**

## General Care

- If nausea and vomiting are tolerated, basic care and transport are the only required treatments.
- Take care with **Metoclopramide** Polyamp as it is similar to **Ipratropium Bromide** and **Atropine** Polyamps in appearance.

# Nausea and Vomiting

## CPG A0701





# Glycaemic Emergencies

**CPG A0702**

## Special Notes

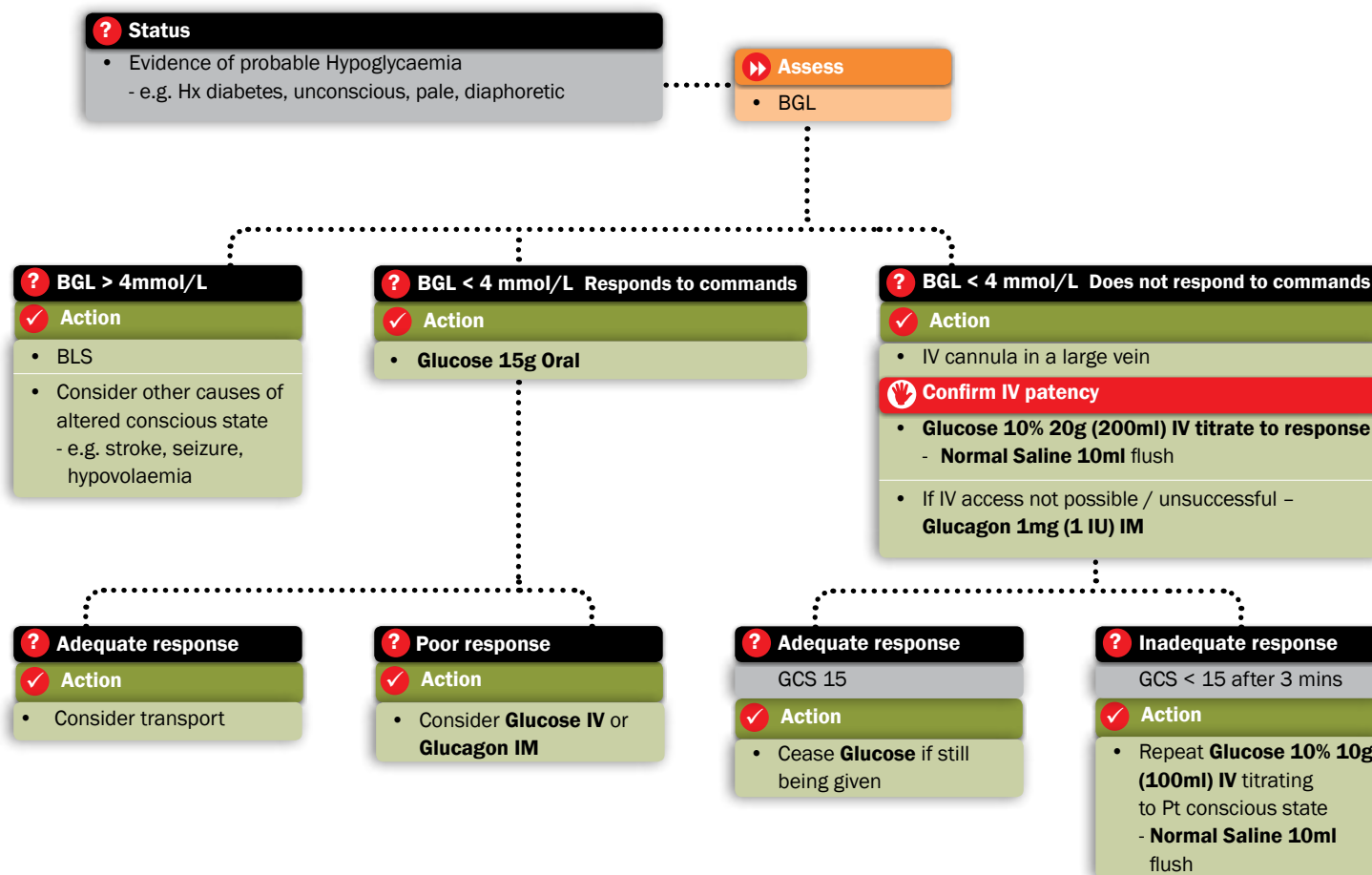
- Pt may be aggressive during management.
- Ensure IV is patent before administering **Glucose**. Extravasation of **Glucose** can cause tissue necrosis.
- Ensure sufficient advice is provided on further management and follow-up if Pt refuses transport
- IV line must never be left In-Situ if the Pt refuses transport.

## General Care

- If Pt's next meal is more than 20 mins away, encourage the Pt to eat a low GI carbohydrate (e.g. sandwich, piece of fruit, glass of milk) to sustain BGL to next meal.
- If adequate response, maintain initial Mx and transport.
- If the Pt refuses transport, repeat the advice for transport using the assistance of a friend or relative. If Pt still refuses transport, document the refusal, and leave Pt with a responsible third person and advise the third person of actions to take if symptoms re-occur and of the need to make early contact with Primary Care Physician for follow up.
- If inadequate response transport without delay.
- Maintain general care of the unconscious Pt and ensure adequate airway and ventilation.
- A further dose of **Glucose 10%** may be required in some Hypoglycaemic episodes. Consider consultation if BGL remains less than 4 mmol/L and it is not possible to administer oral carbohydrates
- Continue initial Mx and transport.

# Glycaemic Emergencies

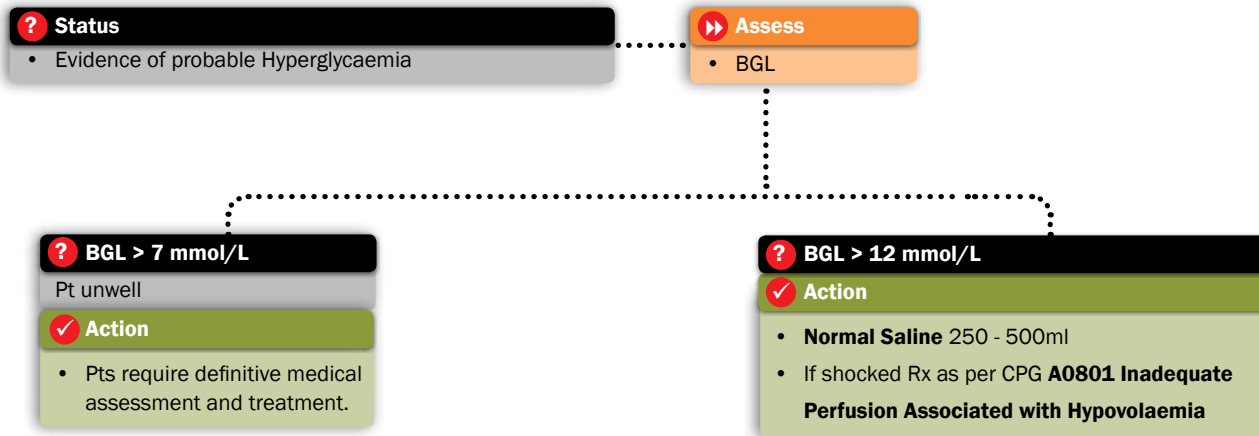
# CPG A0702





# Glycaemic Emergencies

## CPG A0702



# Continuous or Recurrent Seizures

## CPG A0703

### Special Notes

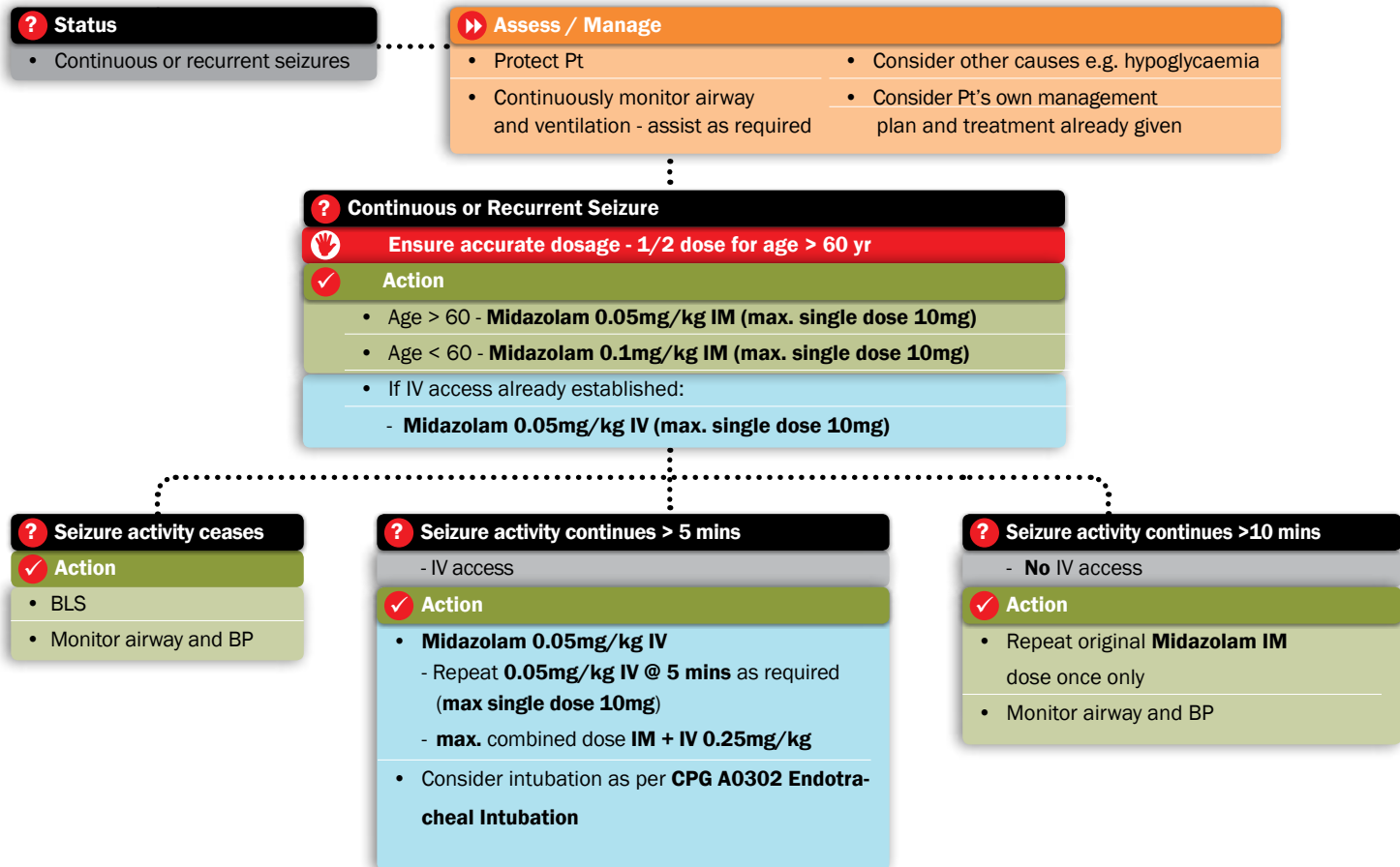
- Seizures may not always present as tonic-clonic limb activity, e.g. unconsciousness with flicking eye movements (nystagmus) may indicate ongoing seizure activity.
- If a single seizure has spontaneously terminated continue with initial management and transport.
- If Pt has a past history of seizures and refuses transport, they may be left in the care of a responsible third party. Advise this person of actions to take if symptoms reoccur and emphasise the importance of early follow up with the patient's primary care physician.
- Administer IM Midazolam if IV access is not already established prior to seizure.
- If IV access is already established prior to a seizure, then consider IV administration of Midazolam.

### Special Notes

- Ensure accurate dose calculation and confirm with other Paramedics on scene.
- **Midazolam** can have pronounced effects on BP, conscious state and airway tone.
- Calculate the dose (mls and mgs) each time as stock strength may change and reliance on familiarity may lead to errors.
- An accurate record of the time a seizure commenced, the duration of seizure, the time until GCS returns to 15 and a detailed description of seizure activity is critical.

# Continuous or Recurrent Seizures

## CPG A0703



# Anaphylaxis

# CPG A0704

## Special Notes

- Signs of allergy include a range of cutaneous manifestations and/or a history of allergen exposure. This history can include food, bites/stings, medications or the allergen can be unknown
- In rare circumstances anaphylaxis can occur with symptoms in an isolated body system. If a patient has hypotension, bronchospasm or upper airway obstruction where anaphylaxis is considered possible following exposure to a **known allergen** for the patient, treat as anaphylaxis.
- International guidelines recommend IM administration of **Adrenaline** to the anterolateral mid-thigh as the preferred site due to improved absorption. While remaining alert to patient comfort and dignity issues, the mid-lateral thigh should be considered the preferred site of administration where possible.
- **IV Adrenaline** bolus doses are no longer considered acceptable practice where an IV infusion can be utilised
- **IM Adrenaline** should be first route of administration even in the severely compromised patient
- **Any infusion established under this Guideline must be clearly labelled with the drug name and dose of any additive drug and their dilution.**
- For patients persistently unresponsive to **Adrenaline** (especially if taking beta blocker medication) the administration of **Glucagon 1-2IU IM or IV** can be considered under medical consult. **Glucagon** administration must not delay further **Adrenaline** administration.
- Anaphylaxis with hypotension or cardiac arrest will require aggressive fluid resuscitation, and is an essential adjunct to adrenaline. Doses of up to 50ml/kg may sometimes be required.

## General Care

- Anaphylaxis can be difficult to identify. Cutaneous features are common though not mandatory. Irrespective of known allergen exposure, if 2 or more systemic manifestations are observed then anaphylaxis should be accepted.
- Deaths from anaphylaxis are far more likely to be associated with delay in management rather than due to inadvertent administration of **Adrenaline**.
- All patients with suspected anaphylaxis must be advised that they should be transported to hospital regardless of their presentation or response to management. International guidelines recommend at least 4 hours observation following treatment.
- Inhaled therapy may be of benefit in management of anaphylaxis though it should always be secondary therapy. Salbutamol may be of use for persistent bronchospasm and Nebulised Adrenaline may be of use for persistent upper airway oedema and stridor.
- Where poor perfusion persists despite initial Adrenaline therapy, large volumes of fluid may be extravasating. IV fluid therapy is indicated to support vasopressor administration
- **Adrenaline infusion**
  - **3mg of 1:1000 Adrenaline** added to **47ml D5W = 60mcg/ml**
  - Infusion rate **1mls/hr = 1mcg/min** titrated up or down according to response
- If **Adrenaline Infusion pump** unavailable
  - Mix **500mcg (0.5ml) of 1:1000 Adrenaline** with **500ml Normal Saline = 1mcg/1ml**
  - Start **Adrenaline** infusion at **10ml/min (10mcg/min - 200 drops per minute)** titrating up or down according to response.

# Anaphylaxis

# CPG A0704

## ? Status

- Suspected anaphylaxis

## Stop

- If patient has history of anaphylaxis and has received management prior to arrival, they **MUST** be transported to hospital for observation and follow up

⋮

## Assess

- Sudden onset of Symptoms (minutes to hours), **AND**
- Two or more symptoms of **R.A.S.H.** with or without confirmed antigen exposure
  - **R** Respiratory distress (SOB, wheeze, cough, stridor)
  - **A** Abdominal symptoms (nausea, vomiting, diarrhea, abdominal pain/cramping)
  - **S** Skin/mucosal symptoms (hives, welts, itch, flushing, angioedema, swollen lips/tongue)
  - **H** Hypotension (or altered conscious state)

## OR

- Isolated hypotension (SBP <90mmHg), or isolated bronchospasm, or Isolated upper airway obstruction, following likely exposure to a known antigen

## OR

- Any single symptoms of **R.A.S.H.** in a patient exposed to a known antigen and previous history of Anaphylaxis/Severe allergic reactions to the same antigen

## ? No Anaphylaxis

### ✓ Action

- Basic life support
- Reassess for potential deterioration
- Consider transport for observation and further management

## ? Anaphylaxis / Severe Allergic reaction

### ✓ Action

- Monitor Pt for cardiac arrhythmias
- **Adrenaline 500mcg IM (1 : 1,000)**
  - Repeat 500mcg IM @ 5 mins until satisfactory results or side effects occur
- Treat bronchospasm as per **A0601 Asthma (A)**
- Consider fluid as per **CPG A0801 Inadequate Perfusion Associated with Hypovolaemia**
- Consider **Nebulised Adrenaline** for upper airway oedema as per **P0601 Upper Airway Obstruction**

## ? Inadequate Response or Deteriorating

### ✓ Action

- If no IV access consider I/O
- **Adrenaline infusion (3mg in 50ml via syringe driver) commencing @ 10mcg/min (10mls/hr) titrated to response or adverse effects**

# Inadequate Perfusion Non-cardiogenic / Non-hypovolaemic

## CPG A0705

### Special Notes

- Any infusions established under this Guideline must be clearly labelled with the name and dose of additive drugs and their dilution.
- Sepsis criteria are relevant in the presence of an infection or other causes of SIRS (Systemic Inflammatory Response Syndrome).
  - 2 or more of:
    - Temp > 38° or < 36°
    - HR > 90
    - RR > 20
    - BP < 90

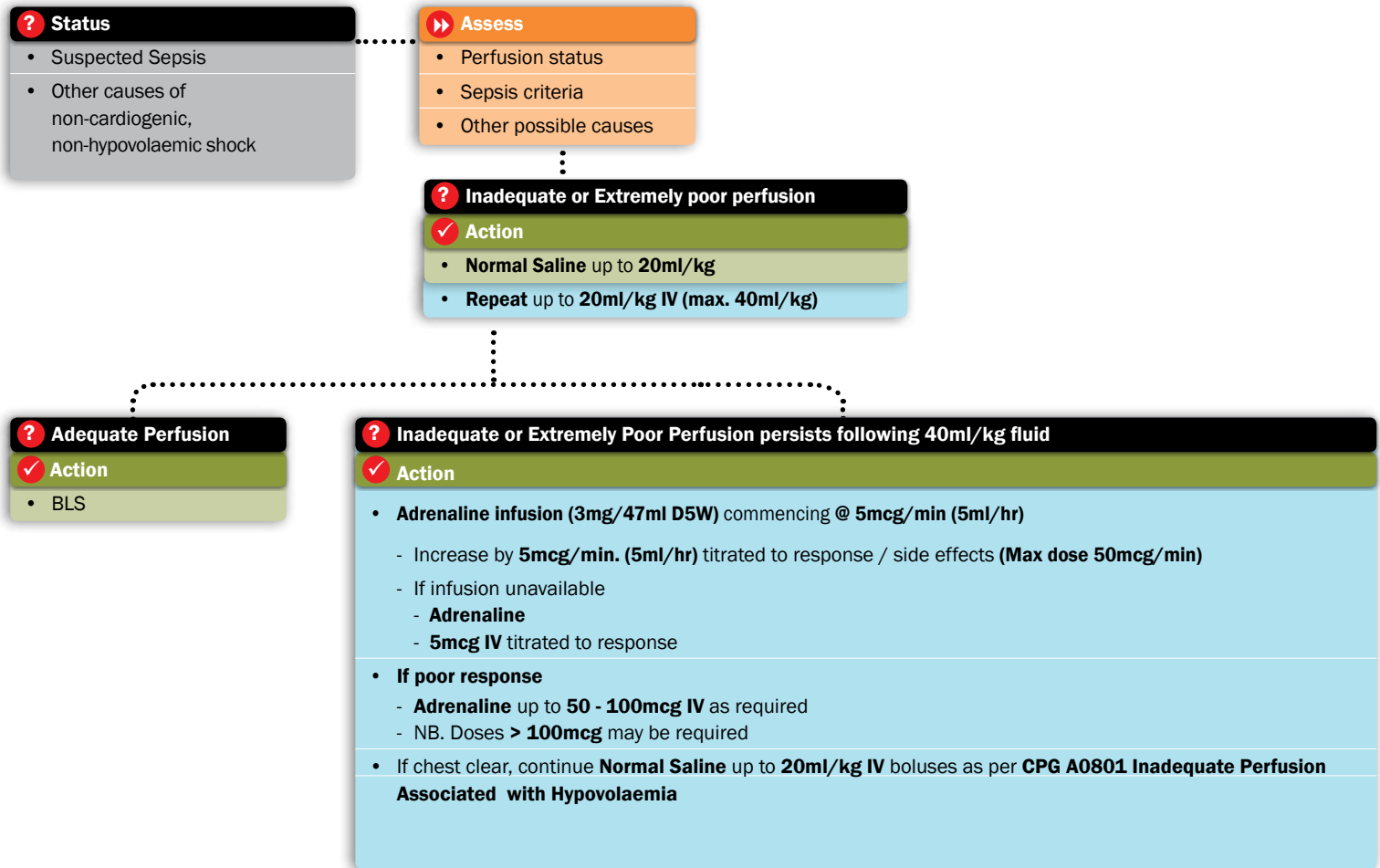
Consider Meningococcal Sepsis

### General Care

- Unstable Pts may require bolus **Adrenaline** concurrently with the infusion.
- **Adrenaline infusion**
  - **3mg Adrenaline** added to **47ml D5W** = **50mcg/ml**  
 Infusion rate **5ml/hr** = **5mcg/min**
- If sepsis is suspected and a prolonged transport times exist, **Medical CONSULT** for **Ceftriaxone** and **Dexamethasone** (dose on consult)
- Consider treatment as per **CPG A0706 Meningococcal Septicaemia**

# Inadequate Perfusion Non-cardiogenic / Non-hypovolaemic

## CPG A0705



# Meningococcal Septicaemia

# CPG A0706

## Special Notes

- Meningococcal septicaemia is a life-threatening infection, caused by the meningococcus bacteria *Neisseria Meningitidis*. Deterioration can be rapid and irreversible, with treatment becoming less effective as the disease state progresses. A Non-blanching rash, either petechial (pin-point) or purpuric (bruises) can be a late sign. If Meningococcal septicaemia is suspected administer Ceftriaxone.
- Meningococcal is transmitted by close personal exposure to airway secretions / droplets.
- Ensure face mask protection especially during intubation / suctioning.
- Ensure medical follow up for staff post occupational exposure.

## General Care

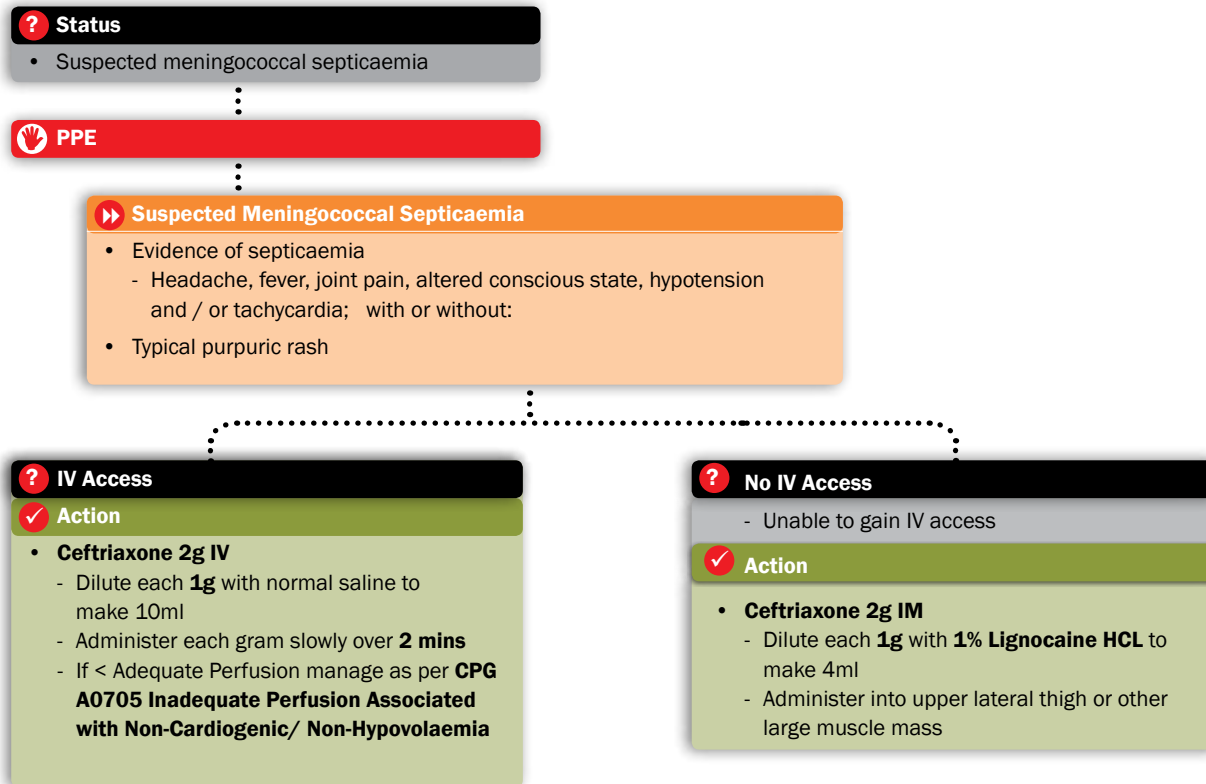
### Ceftriaxone preparation

- Dilute each **1g of Ceftriaxone** with **9.5ml of Normal Saline** and administer **1g IV / IO** over approximately 2 mins. (i.e. 2g over 4mins)
- If unable to obtain IV / IO access, or not accredited in IO access, dilute each **1g of Ceftriaxone** with **3.5ml 1% Lignocaine HCL** and administer each **1g IM** into the upper lateral thigh or other large muscle mass.



# Meningococcal Septicaemia

## CPG A0706



# Management of Overdose

## CPG A0707

### General Care

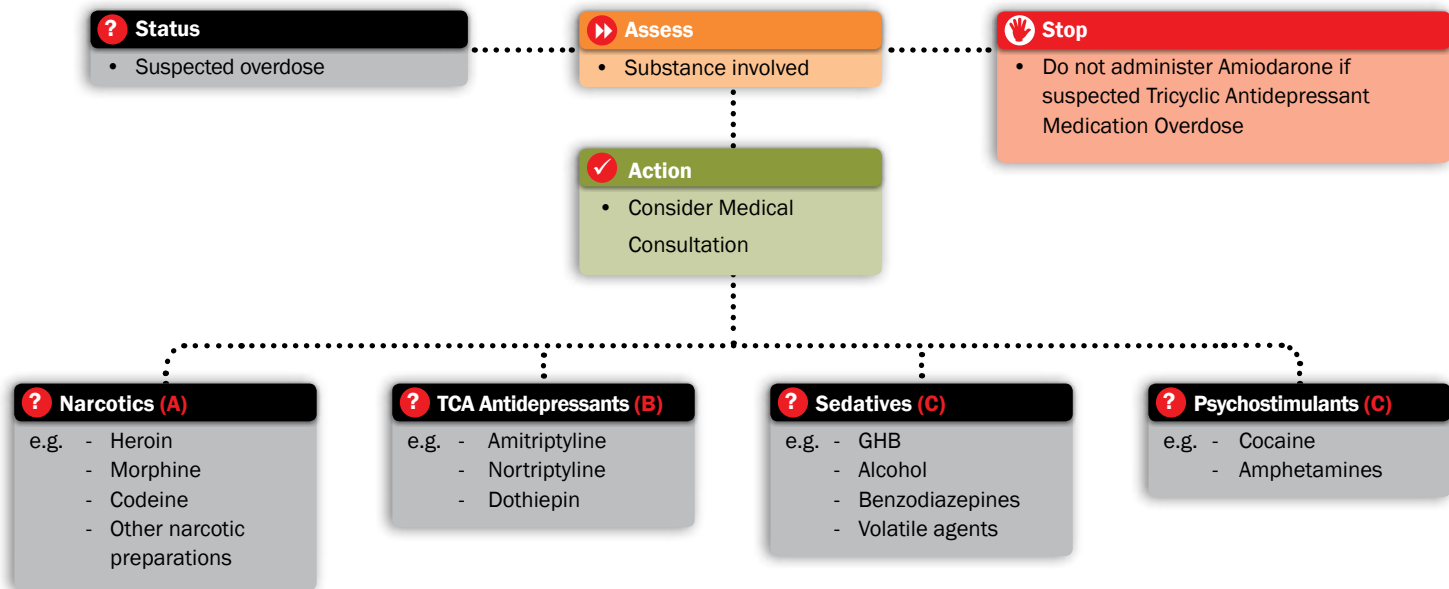
- Provide Supportive Care (all cases)
  - Provide appropriate airway management and ventilatory support
  - If Pt is in an altered conscious state, assess BGL and if necessary manage as per  
**CPG A0702 Glycaemic Emergencies**
  - If Pt is bradycardic with poor perfusion manage as per **CPG A0402 Bradycardia**
  - If Pt is inadequately perfused, manage as per  
**CPG A0801 Inadequate Perfusion Associated with Hypovolaemia**
  - Assess Pt temp. and manage as per  
**CPG A0901 Hypothermia / Cold Exposure, or  
CPG A0902 Environmental Hyperthermia / Heat Stress**

### General Care

- Confirm clinical evidence of substance use or exposure
  - Identify which substance/s are involved and collect if possible.
  - Identify by which route the substance/s had been taken (e.g. ingestion).
  - Establish the time the substance/s were taken.
  - Establish the amount of substance/s taken.
  - What were the substance/s mixed with when taken (e.g. alcohol, water)?
  - What treatment has been initiated prior to Ambulance arrival (e.g. induced vomiting)?

# Management of Overdose

CPG A0707



# Management of Overdose: Narcotics

# CPG A0707

## Special Notes

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

## Special Notes - Partial Reversal

- Most patients require only partial reversal of a narcotic overdose. This may be in instances of recreational, palliative or chronic pain narcotic usage.
- Partial reversal of the overdose and the transport of the patient to hospital is the preferred treatment.
- This is to avoid precipitating withdrawal which may make the patient unmanageable due to behavioural disturbances and possible harmful cardiovascular effects.
- The use of both GCS and Resp Rate as a guide to treatment is acceptable, with a goal of a GCS>12 and RR >8 min (ensuring adequate tidal volume)

## General Care

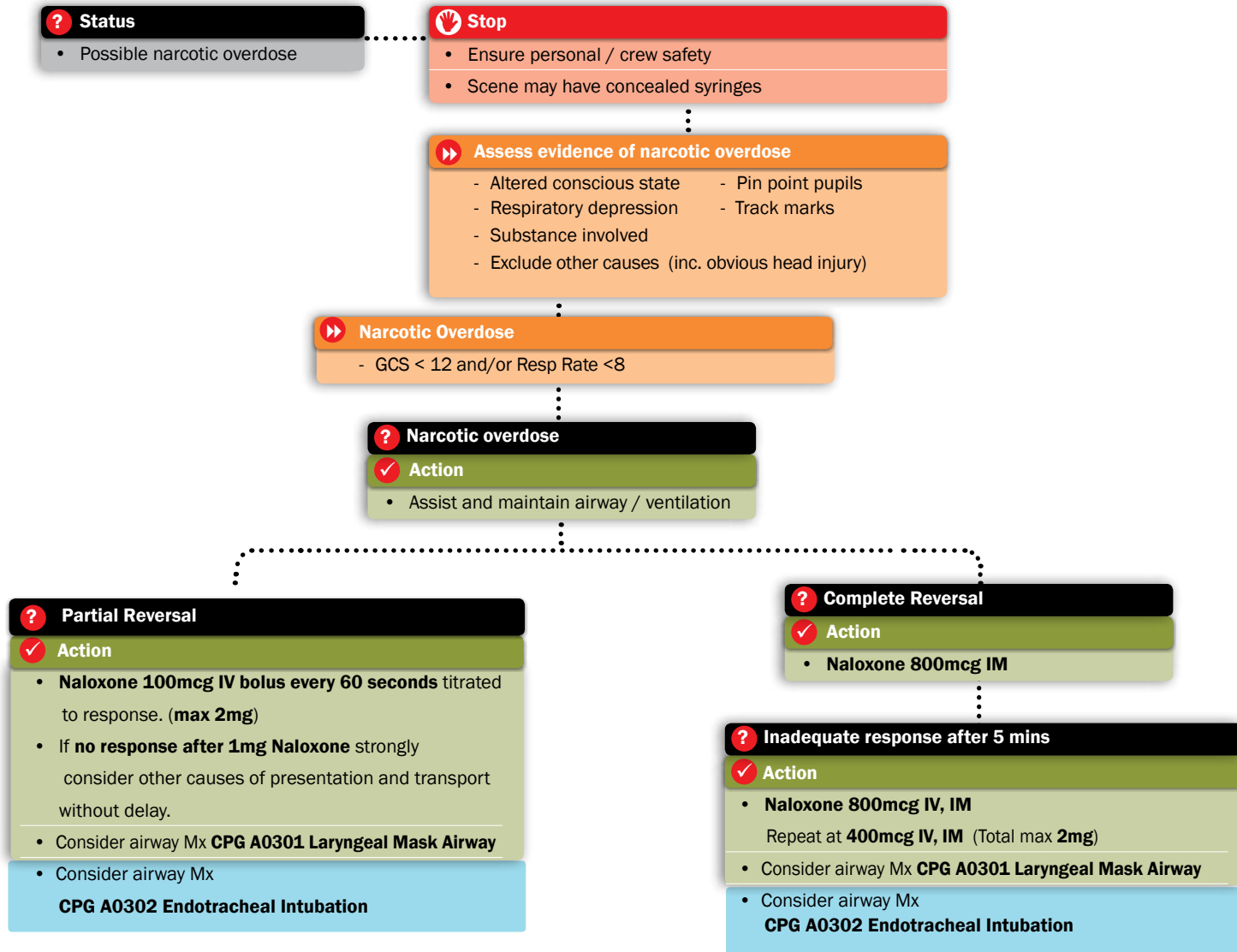
- If inadequate response after 10 mins, Pt is likely to require transport without delay.
- Maintain general care of the unconscious Pt and ensure adequate airway and ventilation.
- Consider other causes e.g. head injury, hypoglycaemia polypharmacy overdose.
- Beware of Pt becoming aggressive.

## Special Notes - Complete Reversal

- This is to be a less commonly utilised treatment pathway reserved for patients who are severely compromised or imminent arrest.
- In this instance complete reversal is the preferred treatment pathway.
- Transport of these patients is still strongly recommended, however may not always be practical due to patient agitation.

# Management of Overdose: Narcotics

CPG A0707 (A)



# Management of Overdose: Tricyclic Antidepressants (TCA)

## CPG A0707

### Special Notes

#### Signs and Symptoms of TCA Toxicity

- Mild to moderate OD
  - Drowsiness, confusion
  - Tachycardia
  - Slurred speech
  - Hyperreflexia
  - Ataxia
  - Mild hypertension
  - Dry mucus membranes
  - Respiratory depression
- Severe toxicity
  - Coma
  - Respiratory depression / hypoventilation
  - Conduction delays
  - Premature Ventricular Contractions (PVCs)
  - SVT
  - VT
  - Hypotension
  - Seizures
  - ECG changes

This could lead to aspiration, hyperthermia, rhabdomyolysis and acute pulmonary oedema.

### Special Notes

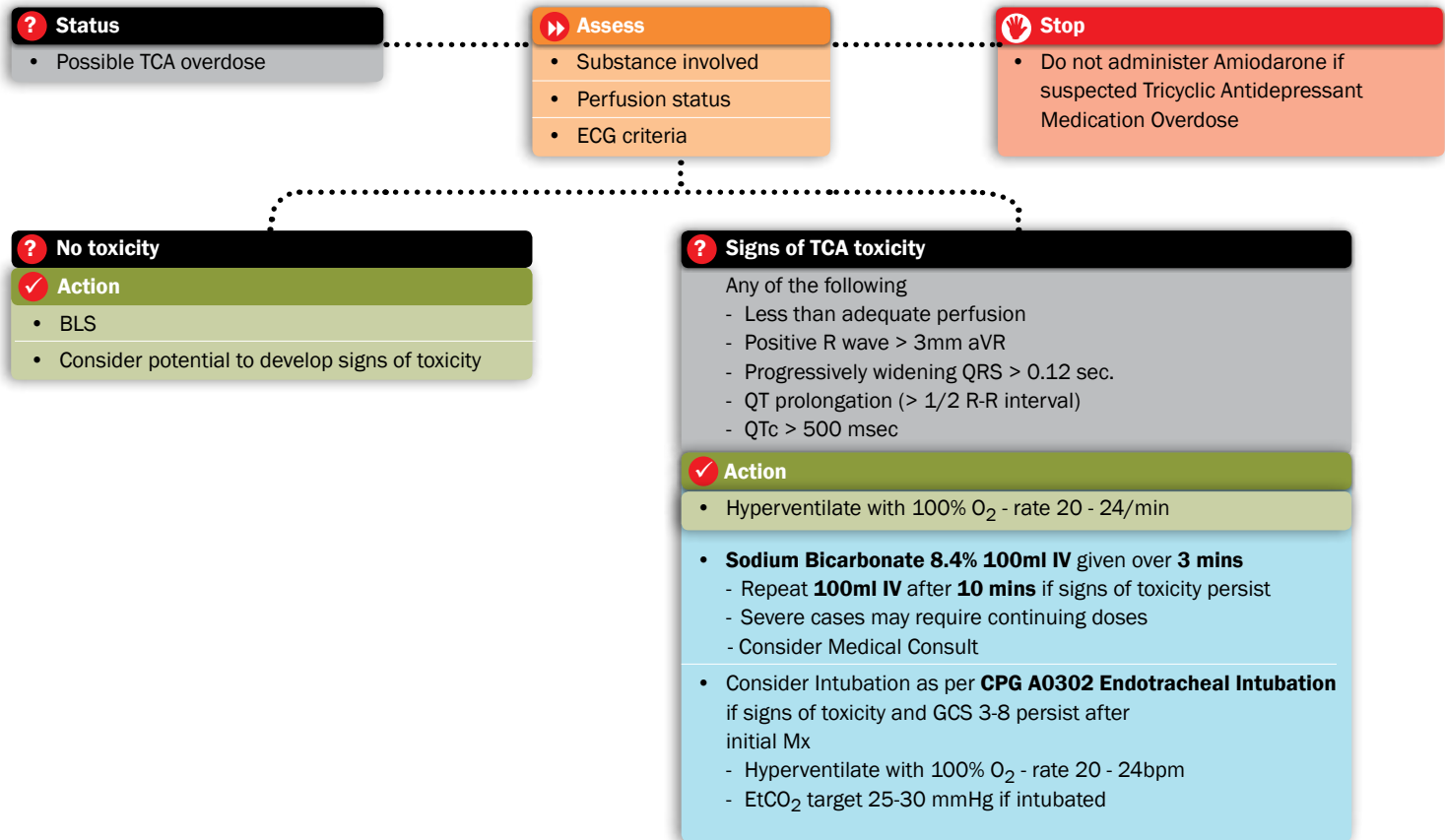
#### ECG changes

ECG changes include positive R wave > 3mm in aVR, prolonged PR, QRS and QT intervals. If QRS widening and >0.12 sec - indicates severe toxicity with risk of ventricular arrhythmias and seizures.

QTc is the corrected QT interval. QTc > 500 msec indicates toxicity with tricyclic overdose. MRX monitors are able to measure QTc when a 12 lead is taken.

- Caution must be used when administering **Sodium Bicarbonate 8.4%** and hyperventilation as the combination has been associated with fatal alkalaemia. Do not allow  $\text{ETCO}_2$  to fall below 25mm Hg.
- **Sodium Bicarbonate 8.4%** should NEVER be administered to patients with a  $\text{EtCO}_2$  below 25mmHg.

# Management of Overdose: Tricyclic Antidepressants (TCA)

**CPG A0707** <sup>(B)</sup>


# Management of Overdose: Sedative Agents / Psychostimulants

# CPG A0707

## Special Notes

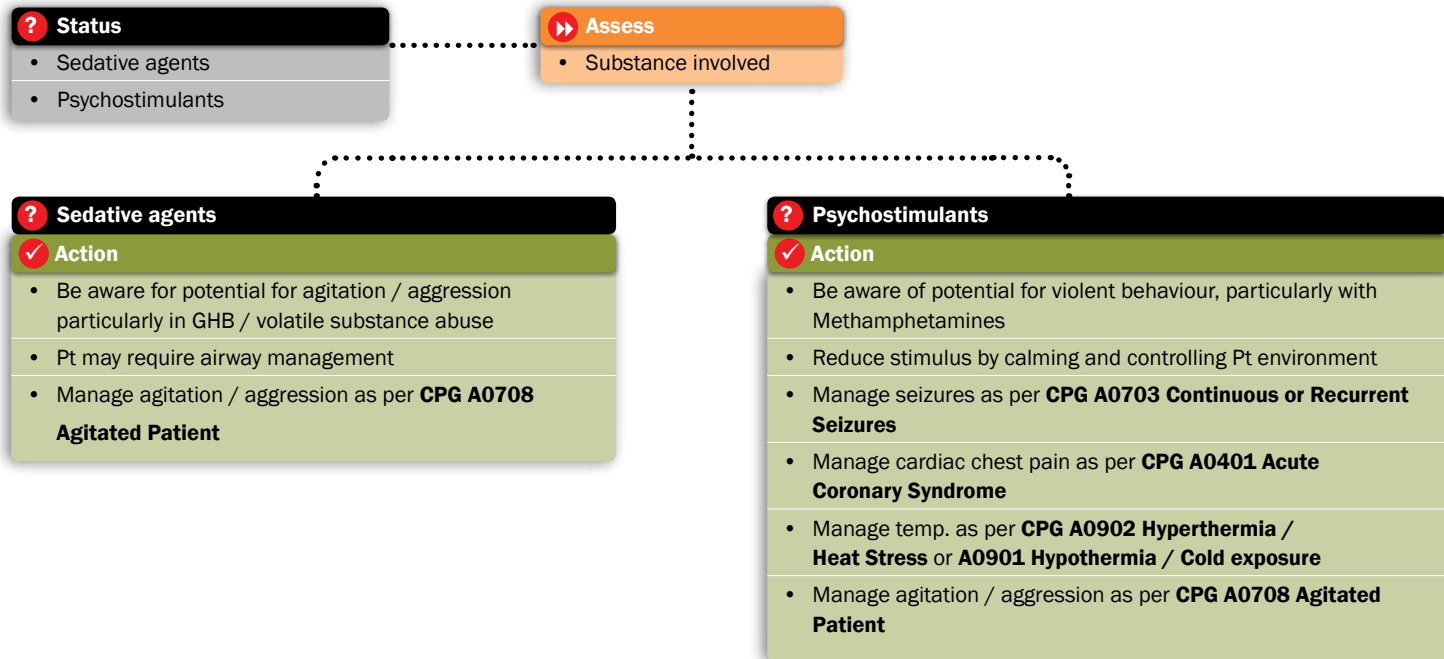
- For young persons, Paramedics should strongly encourage them to make contact with a responsible adult.
- If Pt still refuses transport after repeating the advice for transport using friend/relative assistance, advise the Pt and responsible third person of follow-up, counselling facilities and actions to take for continuing care if symptoms reoccur.
- Paramedics should call the Police if in their professional judgement there appears to be factors that place the Pt at increased risk, such as:
  - is subject to violence (e.g. from a parent, guardian or care giver)
  - is likely to be, or is in danger of sexual exploitation
 In particular for children where:
  - the supply of drugs appears to be from a parent / guardian / care giver.
  - there is other evidence of child abuse / maltreatment or evidence of serious untreated injuries.
- If Pt claims to have taken an overdose of a potentially life-threatening substance then they must be transported to hospital. Police assistance should be sought to facilitate this as required.
- Documentation of refusal and actions taken must be recorded on the PCR .

## Special Notes

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



# Management of Overdose: Sedative Agents / Psychostimulants

**CPG A0707** (c)


**Management of Overdose:**  
**Sedative Agents / Psychostimulants CPG A0707**

# Agitated Patient

## CPG A0708

### Special Notes

#### **Before administering midazolam, the attending paramedic must first:**

- Make a reasonable assessment<sup>1</sup> of whether the 'patient' has legal capacity to consent to, or refuse first aid ("capacity"); and
- Make a reasonable assessment<sup>1</sup> of the nature of the Pt's condition ("perceived medical condition").

After making the above assessments, the attending Paramedic(s) will be able to lawfully administer midazolam if either of criterion "a" or "b", which follow, applies:

- a** The administration of midazolam is reasonably necessary<sup>2</sup> to avert a serious and imminent threat to the Pt's life or physical or mental health,<sup>3</sup> and either:
  - The Pt has been assessed as lacking capacity; or
  - The Pt has been assessed as having capacity and has consented to being administered with midazolam;
- b** Regardless of whether the Pt has capacity, the administration of midazolam is reasonably necessary to prevent a Pt harming another person, provided that its use is a proportionate response to the perceived risk of harm to the other person.

### Special Notes

- <sup>1</sup> What will constitute a reasonable assessment in the field will depend on the prevailing circumstances, such as whether it is safe to approach the Pt, accordingly, a reasonable assessment may require the assessment to be conducted from a considerable distance. Furthermore, the urgency of the situation may also required that such an assessment be only fleeting.
- <sup>2</sup> What is necessary first aid is not something that should be adjudged after the fact with the benefit of hindsight. Rather, in the context of provision of first aid by Paramedics in the field, what is necessary first aid is that which is 'reasonably necessary'. That is, necessary first aid is first aid that would be necessary to avert a serious and imminent threat to the Pt's life or to prevent a deterioration of his or her physical or mental health, assuming the Pt's perceived medical condition is his or her medical condition in fact.
- <sup>3</sup> Administration of midazolam may be 'indirectly necessary' in that it is reasonably necessary to facilitate the administering of first aid which is itself 'reasonably necessary', or it may be 'directly necessary' either to prevent harm to a person other than the Pt or as necessary first aid itself.

# Agitated Patient

## CPG A0708

### Special Notes

- The indications for the use of sedation and/or restraint must be clearly documented on the PCR.
- Mechanical restraint may also be utilised without the use of sedation in circumstances where the Pt will not sustain further harm by fighting against the restraints.
- Mechanical restraints should not be placed on a pt in the prone position and must be removed if there is any indication that the restraint is compromising the provision of supportive care.
- The type of restraint used and its time of application and/or removal must be clearly documented on the PCR.

### Hyperthermia

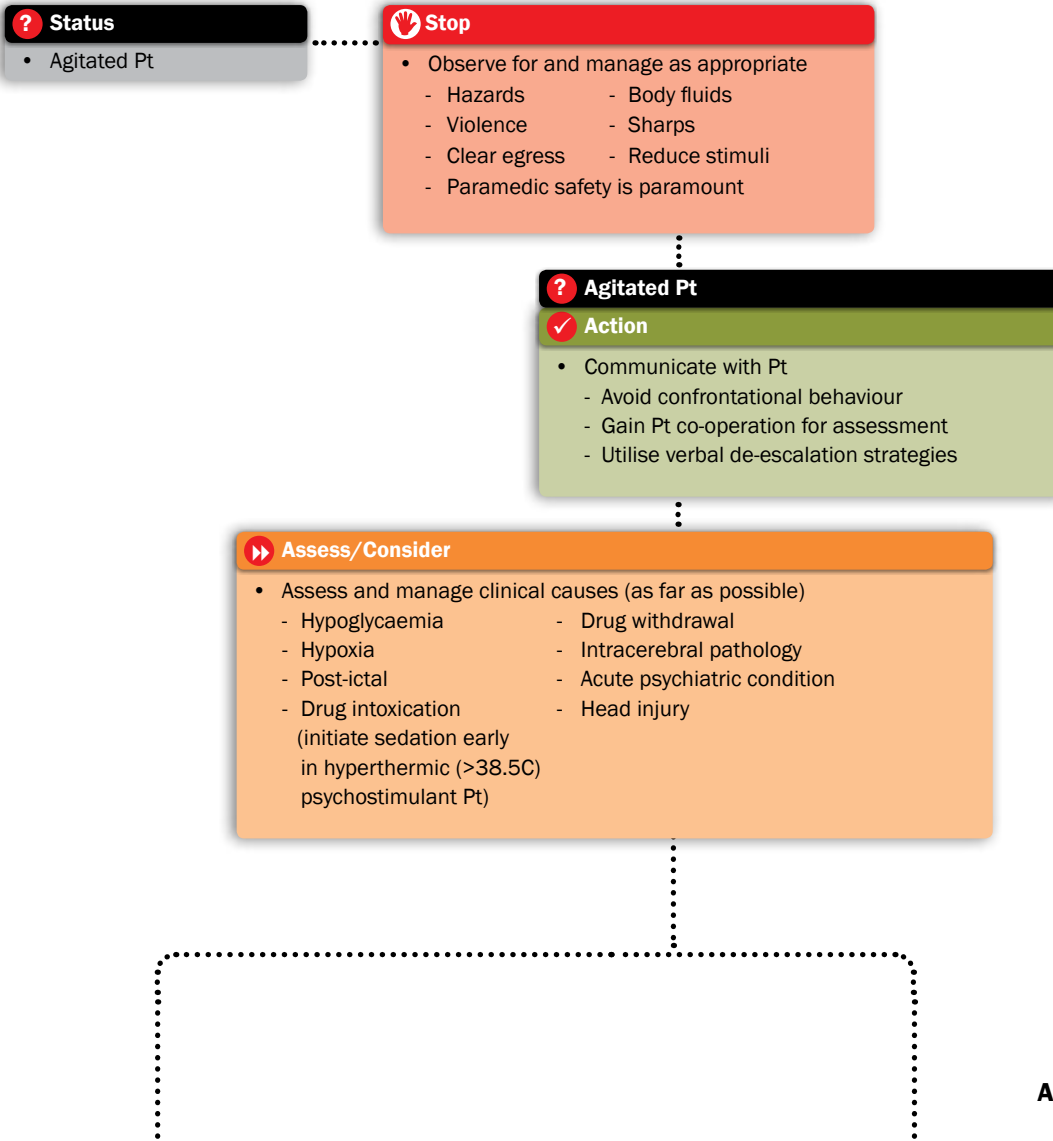
- Sedation should be initiated early in hyperthermic Pts who have been using psychostimulants to assist with cooling and avoid further increases in temp. secondary to agitation.

### General Care

- Paramedic safety is to be considered paramount at all times. Do not attempt any element of this Guideline unless all necessary assistance is available.
- Provide supportive care in all cases where sedation administered.
- Provide airway management appropriate to the clinical condition, administer oxygen to all Pts and assist ventilation as required.
- If less than adequate perfusion manage as per **CPG A0705 Inadequate Perfusion (Non-cardiogenic / Non-hypovolaemic)**.
- Continue to assess Pt temp. and manage as per **CPG A0902 Environmental Hyperthermia / Heat Stress**, or **CPG A0901 Hypothermia / Cold Exposure**.
- If not already completed, ensure that all possible clinical causes of agitation are assessed and managed by the appropriate Guideline.
- **Medical Consult** is required before sedation of head injured patients.

# Agitated Patient

# CPG A0708



? Able to Mx without restraint/sedation

✓ Action

- Mx cause as appropriate
- Continue to treat cause of agitation
- Beware Pt condition may change and agitation increase requiring restraint/sedation

? Requires restraint/sedation

- Does not respond to verbal de-escalation
- Clinical causes have been excluded
- Pt risk to themselves or others
  - e.g. combative, agitated or aggressive



Stop

- Ensure sufficient physical assistance
- Reduced sedation dose for age >60yrs, low body weight or frail
- Reduced sedation dose for < 100mmHg systolic blood pressure

✓ Action

- **Age > 60 and/or BP < 100**
  - Midazolam up to 0.05mg/kg IM
    - Repeat initial dose @ 10 mins IM (max 4 doses) as required
- **Age < 60 and BP > 100**
  - Midazolam up to 0.05 - 0.1mg/kg IM (max 10mg per dose)
    - Repeat initial dose @ 10 mins IM (max 4 doses) as required
- Apply mechanical restraint devices if required
- Above doses may be given IV and repeated @ 5 mins as required
- IM injections may be indicated until IV access has been established



# Mental Health

## CPG A0708(b)



**Stop**

- **This guideline is only to be utilised by paramedics authorised by the Chief Civil Psychiatrist to perform the functions of a Mental Health Officer (MHO) with consent of the Director of Ambulance Services**

### Mental Health Act/Protective Custody

#### Paramedics may sedate a patient in protective custody if:

- The paramedic considers it necessary or prudent to do so and;
- The paramedic has exhausted other means of getting the patient to hospital in a less restrictive manner

#### A paramedic may take a person into protective custody if they reasonable believe that:

- The person has a mental illness; and
- The person should be examined to see if he/she needs to be assessed against the assessment or treatment criteria; and
- The persons safety or the safety of other persons is likely to be at risk if the person is not taken into protective custody.



**Stop**

- **The patient has to be in protective custody prior to administration of sedation or restraint.**
- **Paramedic safety is to be considered paramount at all times.**
  - Do not attempt any element of this guideline unless appropriate resources (police and/or ambulance) are on scene

### Sedation

- Sedation may be utilised to facilitate transportation of patients in protective custody/under escort, with whom de-escalation techniques have failed and the crew consider it necessary to do so.
- Exercise extreme caution in elderly and/or low body weight patients. Administer considerably smaller doses.
- Provide supportive care and airway management appropriate to the clinical condition, administer oxygen to all patients and assist ventilation if required.

### Mechanical Restrain

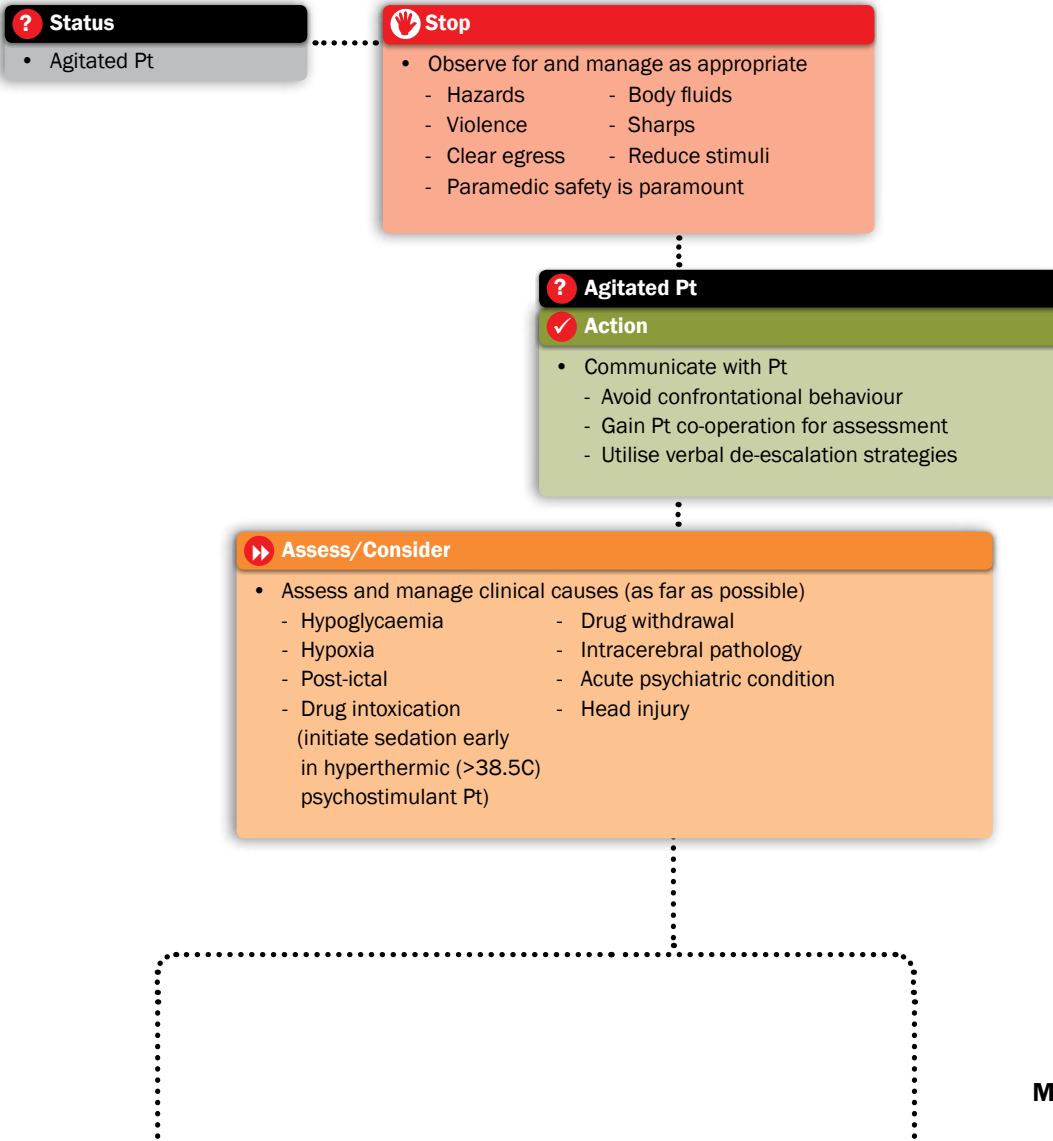
- Mechanical restraint may be utilised without the use of sedation in circumstances where the patient will not sustain further harm by fighting the restraints.
- **Mechanical restraints are never to be placed on a patient in the prone position and must be removed if there is any indication that the restraint is compromising the provision of supportive care.**

### General

- The indications for the use of sedation and/or restraint must be clearly documented on the patient care report
- The type of restraint used and its time of application and/or removal must be clearly documented on the patient care report

# Mental Health

## CPG A0708(b)





? Able to Mx without restraint/sedation

✓ Action

- Mx cause as appropriate
- Continue to treat cause of agitation
- Beware Pt condition may change and agitation increase requiring restraint/sedation

? Requires restraint/sedation

- Does not respond to verbal de-escalation
- Clinical causes have been excluded
- Pt risk to themselves or others
  - e.g. combative, agitated or aggressive

🛑 Stop

- Ensure sufficient physical assistance
- Reduced sedation dose for age >60yrs, low body weight or frail
- Reduced sedation dose for < 100mmHg systolic blood pressure

✓ Action

- **Age > 60 and/or BP < 100**
  - Midazolam up to 0.05mg/kg IM
    - Repeat initial dose @ 10 mins IM (max 4 doses) as required
- **Age < 60 and BP > 100**
  - Midazolam up to 0.05 - 0.1mg/kg IM (max 10mg per dose)
    - Repeat initial dose @ 10 mins IM (max 4 doses) as required
- Apply mechanical restraint devices if required
- Above doses may be given IV and repeated @ 5 mins as required
- IM injections may be indicated until IV access has been established

# Organophosphate Poisoning

**CPG A0709**

## Special Notes

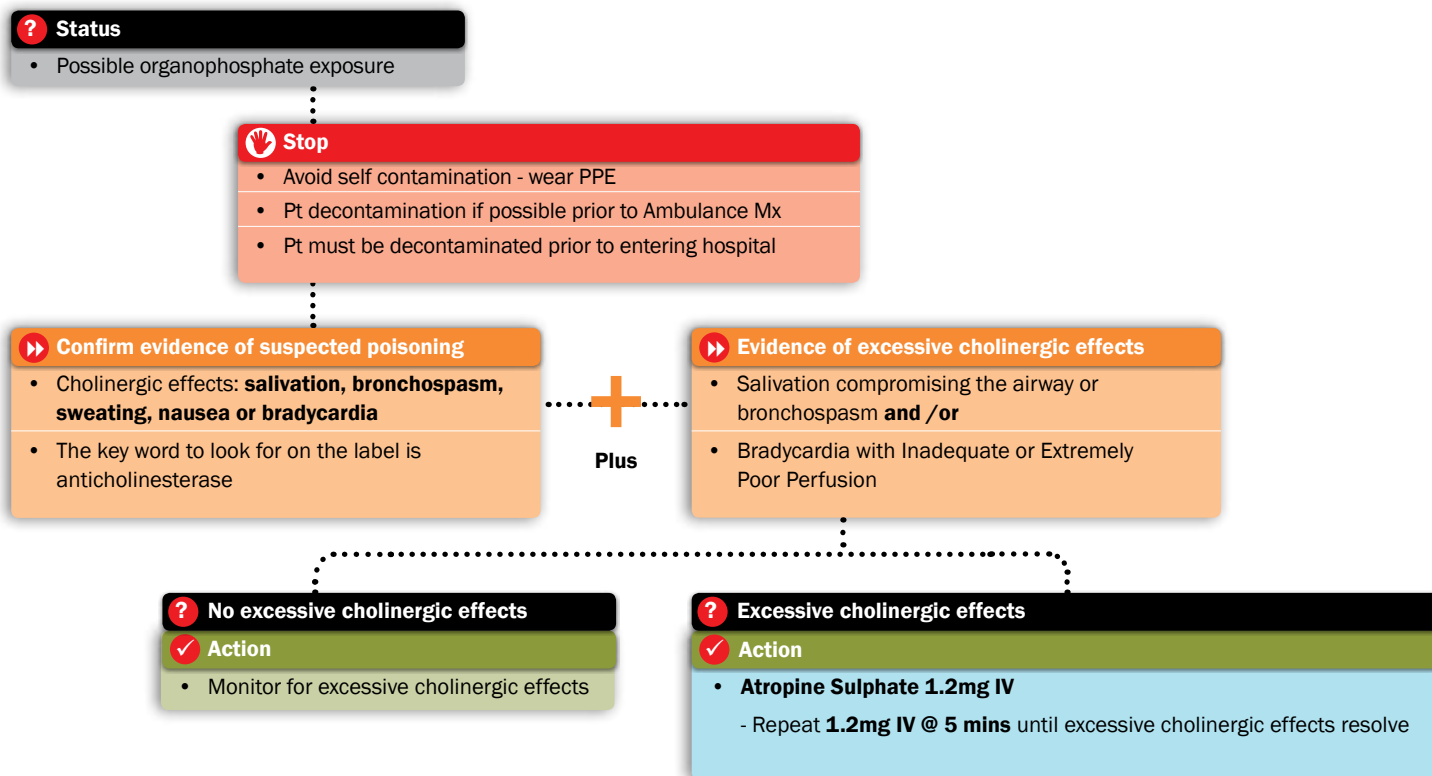
- Notification to receiving hospital essential to allow for Pt isolation.
- The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used both commercially and domestically.
- If a potential contamination by a possible organophosphate has occurred, the container identifying trade and generic names should be identified and the Poisons Information Centre contacted for confirmation and advice.

## General Care

- Where possible, remove contaminated clothing and wash skin thoroughly with soap and water.
- If possible minimise the number of staff exposed.
- Attempt to minimise transfers between vehicles.

# Organophosphate Poisoning

## CPG A0709



# Autonomic Dysreflexia

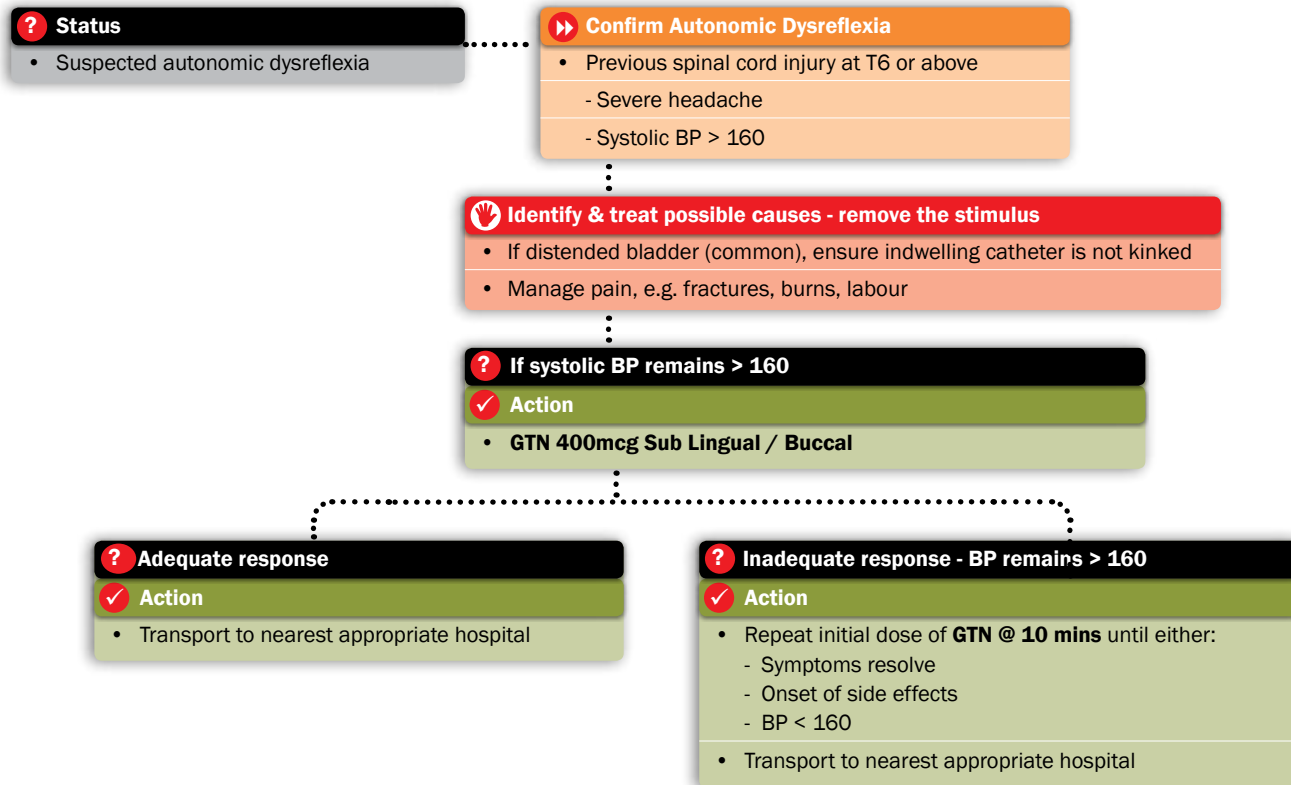
## CPG A0710

### Special Notes

- Move and transport the Pt gently and slowly, even if the symptoms are relieved as this presentation meets the criteria of Autonomic Dysreflexia, a medical emergency that requires identification of probable cause and treatment in hospital to prevent cerebrovascular catastrophe.
- Due to the infrequency of Paramedics encountering pts suffering from Autonomic Dysreflexia, **Medical Consult** is encouraged, especially for Paediatric pt presentations.

# Autonomic Dysreflexia

## CPG A0710













# Inadequate Perfusion Associated with Hypovolaemia

## CPG A0801

### Special Notes

Clinical signs of significant dehydration include;

- Postural perfusion changes including tachycardia, hypotension and dizziness
- Decreased sweating and urination
- Poor skin turgor, dry mouth, dry tongue
- Fatigue and altered consciousness
- Evidence of poor fluid intake compared to fluid loss

Dehydration in the hyperglycaemic patient should be managed under this guideline

### Remember

Consider Tourniquet application for severe extremity bleeding unresponsive to direct pressure or where direct pressure is considered impractical.

### General Care

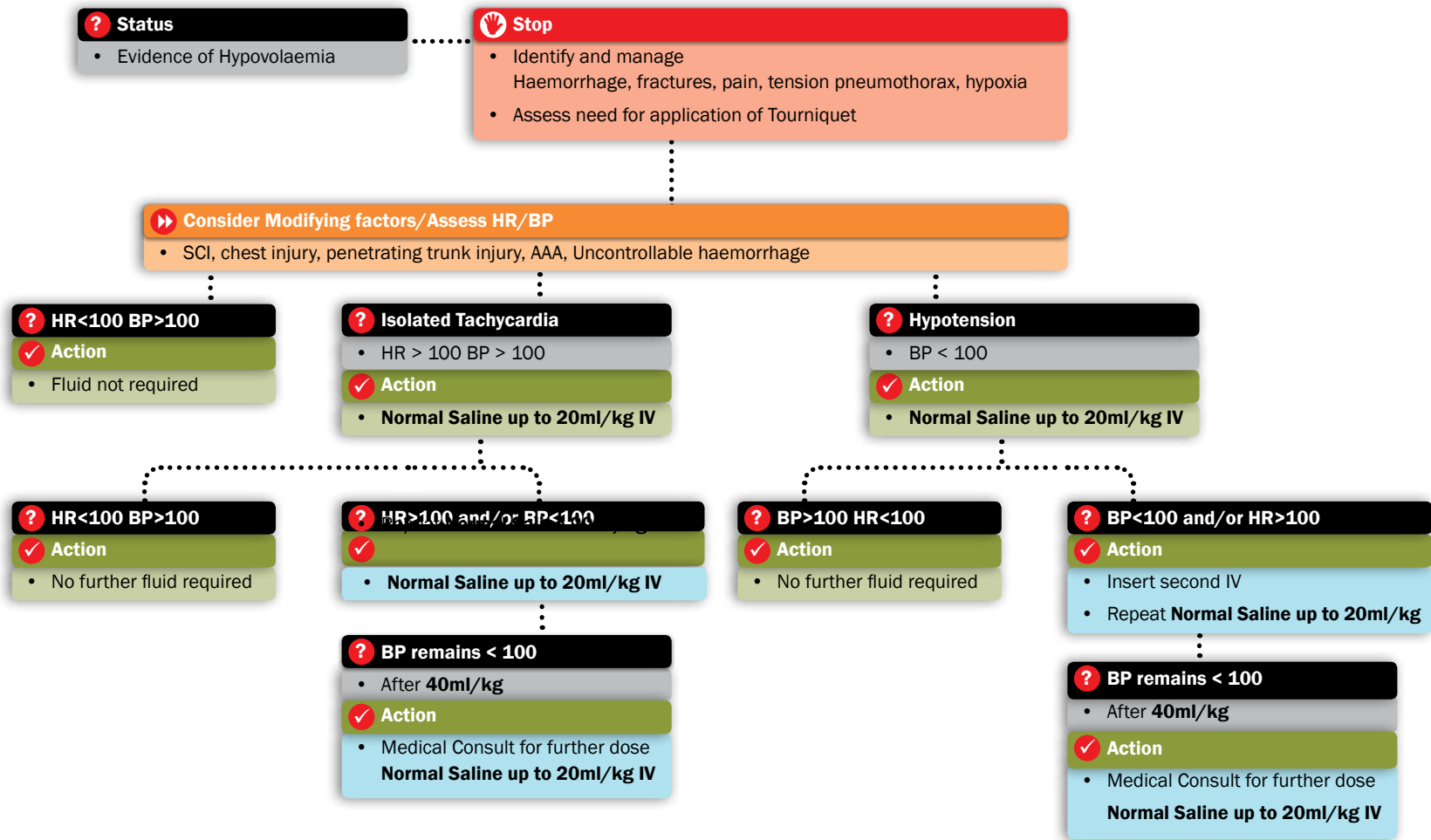
- Titrate fluid administration to Pt response.
- Aim for HR < 100, BP > 100.
- Consider establishing IV en route. Do not delay transport for IV therapy.
- Always consider tension pneumothorax, particularly in the Pt with a chest injury not responding to fluid therapy and persistently hypotensive.
- Excessive fluid should not be given if spinal cord injury is an isolated injury.

### Modifying factors

- Complete spinal cord transection Rx as per **CPG A0804 Spinal Cord Injury**
  - Pt with isolated neurogenic shock can be given up to **500ml Normal Saline** bolus to correct hypotension. No further fluid should be given if SCI is the sole injury.
- Chest injury - Consider tension pneumothorax Rx as per **CPG A0802 Chest Injury**
- Penetrating Trunk Injury, suspected aortic aneurysm or uncontrolled haemorrhage - **Accept palpable carotid pulse with adequate conscious state and transport immediately**

# Inadequate Perfusion Associated with Hypovolaemia

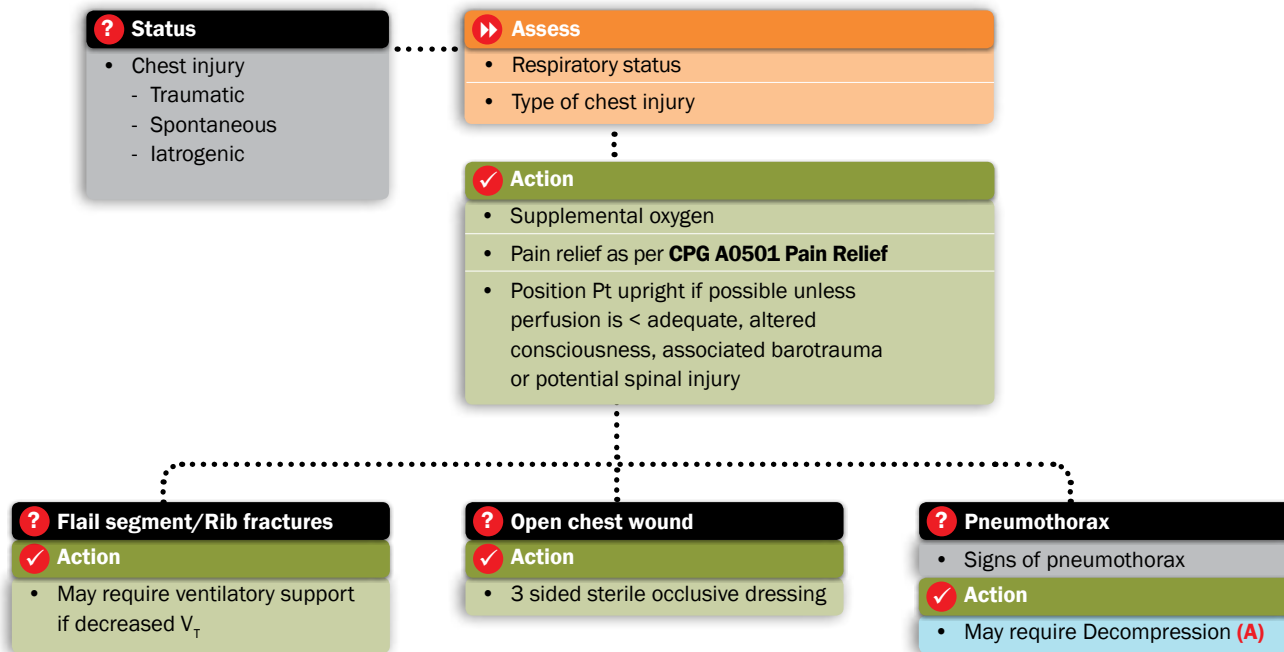
## CPG A0801





# Chest Injuries

## CPG A0802



# Chest Injuries

## CPG A0802

### Special Notes

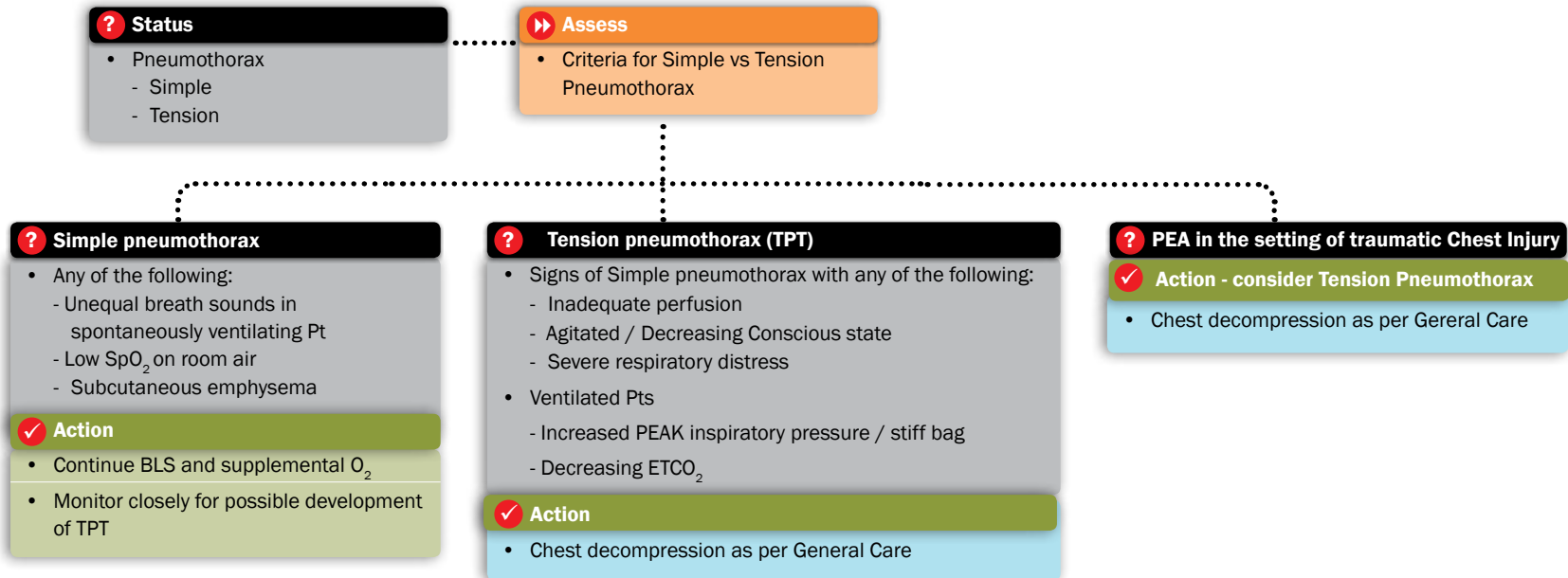
- In IPPV setting, equal air entry is **NOT** an exclusion criteria for TPT.
- Chest injury Pts receiving IPPV have a high risk of developing a TPT. Solution for poor perfusion in this setting includes chest decompression.
- Cardiac arrest Pts are at risk of developing chest injury during CPR.
- Troubleshooting
  - Pt may re-tension as lung inflates if catheter kinks off.
  - Catheter may also clot off, flush with sterile **Normal Saline**.
- **Insertion site for Pneumothorax Set**
  - Second intercostal space
  - Mid clavicular line (avoiding medial placement)
  - Above rib below (avoiding neurovascular bundle)
  - Right angles to chest (towards body of vertebrae)

### General Care

- **Tension Pneumothorax (TPT)**
  - If some clinical signs of TPT are present and the Pt is deteriorating with decreasing conscious state **and/ or** poor perfusion, immediately decompress chest by inserting an approved Pneumothorax set
  - If air escapes, or air and blood bubble through the cannula, or no air/blood detected, leave insitu and secure.
  - If no air escapes but copious blood flows through the cannula then a major haemothorax is present.

# Chest Injuries

CPG A0802 (A)



# Severe Traumatic Head Injury

**CPG A0803**

## Special Notes

- **Fentanyl** should be the narcotic drug of choice for Traumatic Head Injury Pts.
- Patients with head injury requiring intubation should be managed with a Supraglottic Airway due to potential for Spinal Cord Injury (SCI).
- **Ketamine** is contraindicated for traumatic head injury patients.
- Caution should be exercised with the use of nasopharyngeal airway with patient with suspected base of skull fracture.
- For mechanically ventilated patient - avoid barotrauma.  
Peak Inspiratory Pressure < 35cm H<sub>2</sub>O
- **Medical Consult** is required before sedation of head injured patients.

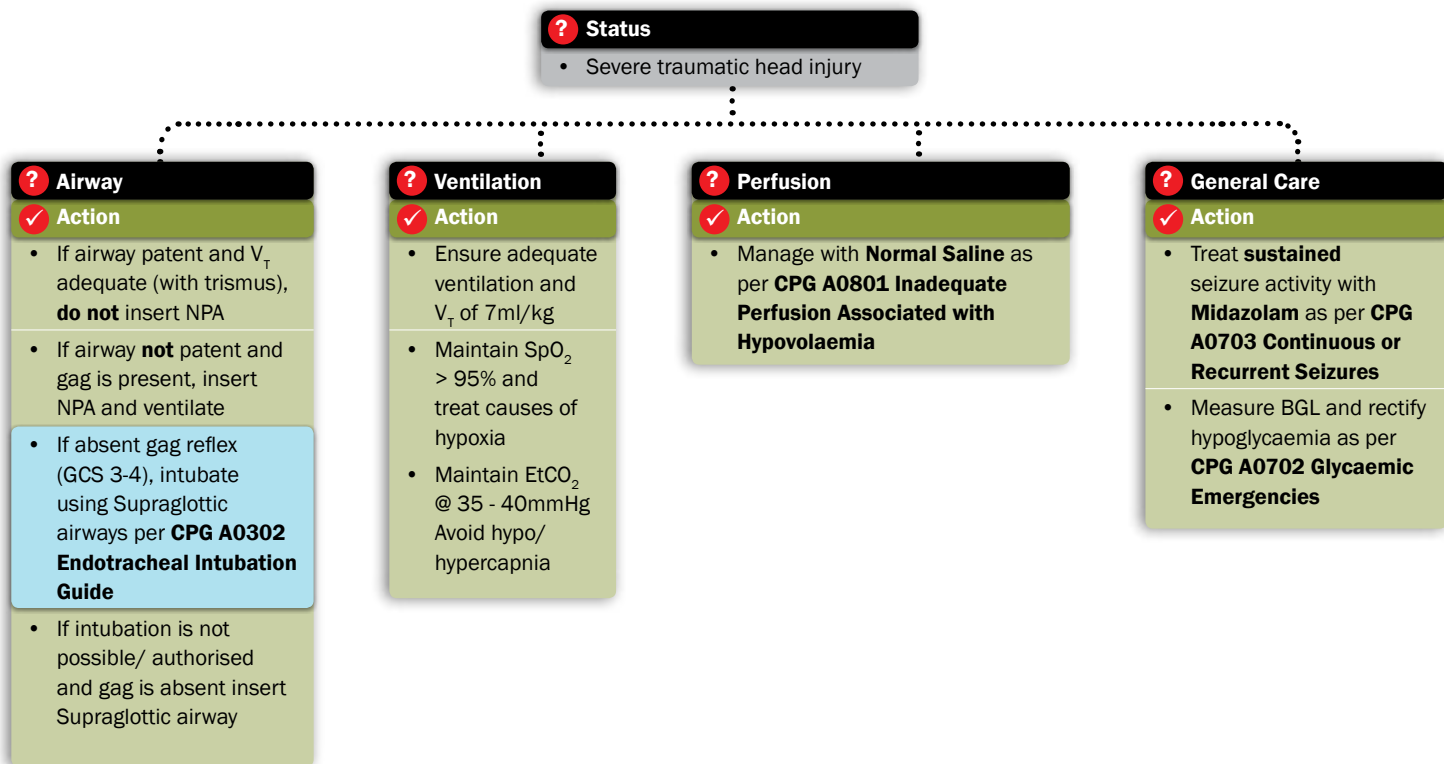
## General Care

- Dress open skull fractures/wounds with sterile combine soaked in sterile **Normal Saline 0.9%**.
- Maintain manual in-line neck stabilisation and apply cervical collar when convenient. If intubation is required, apply cervical collar after intubation. Attempt to minimise jugular vein compression.
- Attempt to maintain normal temp.



# Severe Traumatic Head Injury

## CPG A0803





# Spinal Injury

## CPG A0804

### Special Notes

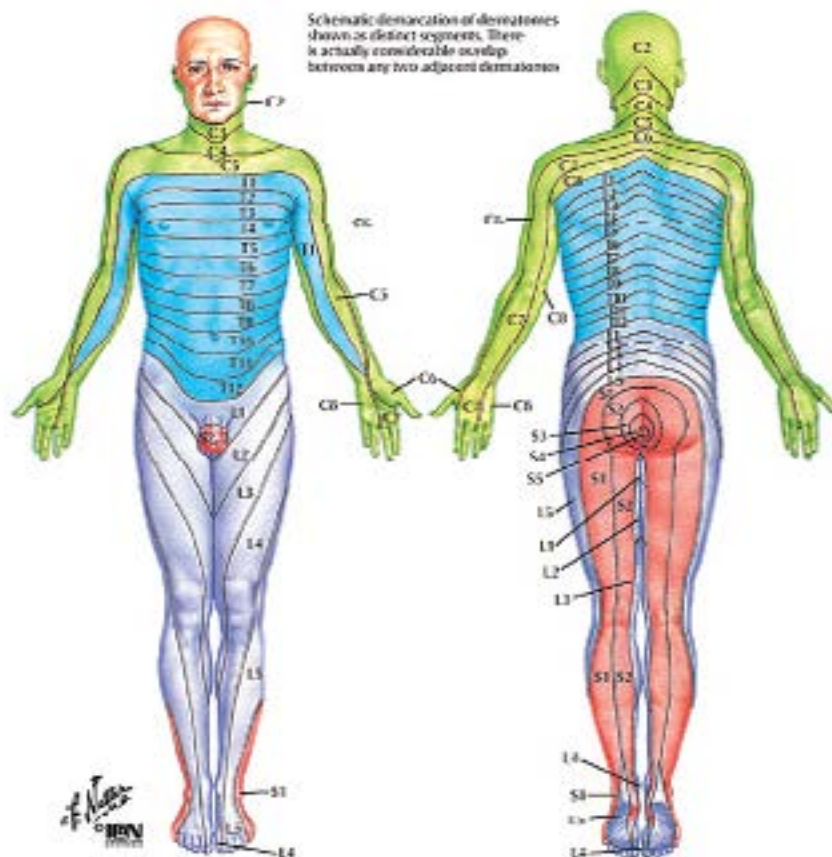
- A cervical collar alone does not immobilise the cervical spine. If the neck needs immobilising then the whole spine needs immobilising. This may include the use of head rolls or approved proprietary devices and the whole body immobilised on a spineboard or Ambulance stretcher in a manner that is appropriate for the presenting problem. A spineboard must be restrained to the Ambulance stretcher during transport.
- The head should not be independently restrained.
- In Pts with a diseased vertebral column, a lesser mechanism of injury may result in SCI and should be managed accordingly.
- Spinal immobilisation with neutral alignment may not be possible in a Pt with a diseased vertebral column with associated anatomical deformity and should be modified accordingly e.g. position of comfort.
- Forcibly immobilising the patient may be detrimental to the patient's condition.
- Spinal immobilisation is not without risk. Complications may include head and neck pain, detrimental effects on pulmonary function and subsequent neurological deficit (particularly in the elderly).
- Suspect high spinal injury in the unconscious trauma patient with bradycardia and hypotension.

### Special Notes

- If a cervical collar is applied then it must be properly fitted and applied directly to the skin, not over clothing and not placing any pressure on the neck veins.
- Where there is no immediate risk to life and extrication is required then an extrication device should be considered.
- Pts with a SCI may develop pressure areas within as little as 30 min following placement on a spine board and the duration on a spine board must therefore be noted on the case report.
- For transport times in excess of 30 min consideration should be given to removing the Pt from a spineboard and appropriately securing them to the Ambulance stretcher.
- Pts with isolated neurogenic shock should be given a small fluid bolus (up to **500ml Normal Saline IV**) to correct hypotension. No further fluid should be given if SCI is the sole injury.
- The Pt with multi trauma and SCI may not mount a sympathetic response to hypovolaemia. Fluid should be given based on estimated blood loss.
- A motor sensory assessment is essential to assess for spinal cord injury. **When spinal cord injury identified, consult with Clinical Coordinator for appropriate destination.**

# Spinal Injury

## CPG A0804



### Levels of principal dermatomes

- C5 Clavicles
- C5, 6, 7 Lateral parts of upper limbs
- C6, T1 Medial sides of upper limbs
- C6 Thumb
- C6, 7, 8 Hand
- C8 Ring and little fingers
- T4 Level of nipples

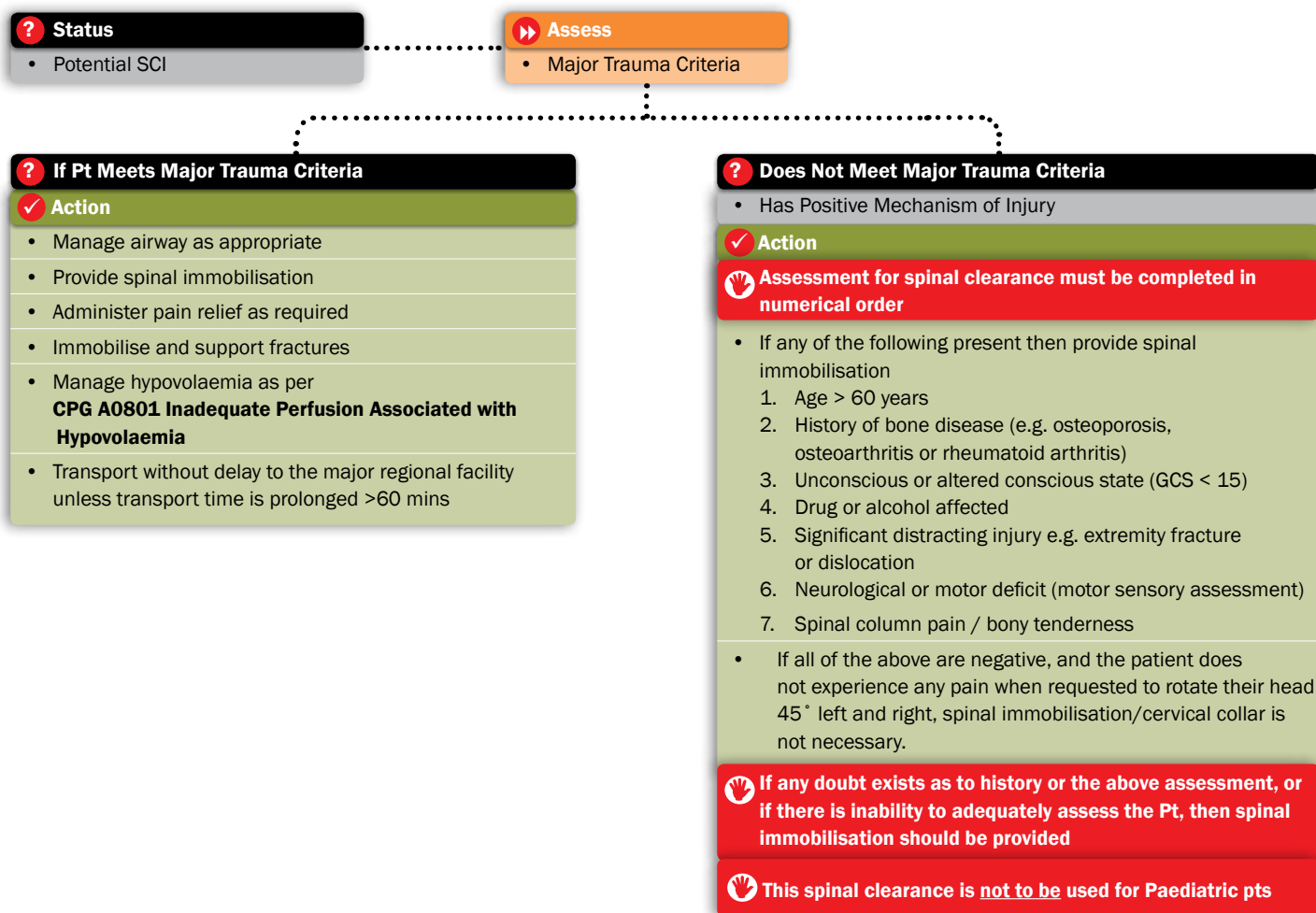
### T10

- Level of umbilicus
- T12 Inguinal or groin regions
- L1, 2, 3, 4 Anterior and inner surfaces of lower limbs
- L4, 5, S1 Foot
- L4 Medial side of great toe
- S1, 2, L5 Posterior and outer surfaces of lower limbs
- S1 Lateral margin of foot and little toe
- S2, 3, 4 Perineum

Reproduced from Atlas of Human Anatomy by Frank Netter, MD.

# Spinal Injury

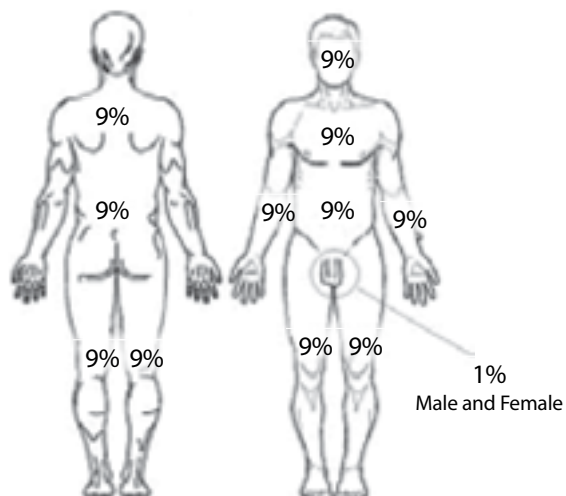
## CPG A0804



# Adult Burns

# CPG A0805

## Wallace Rule of Nines



## General Care

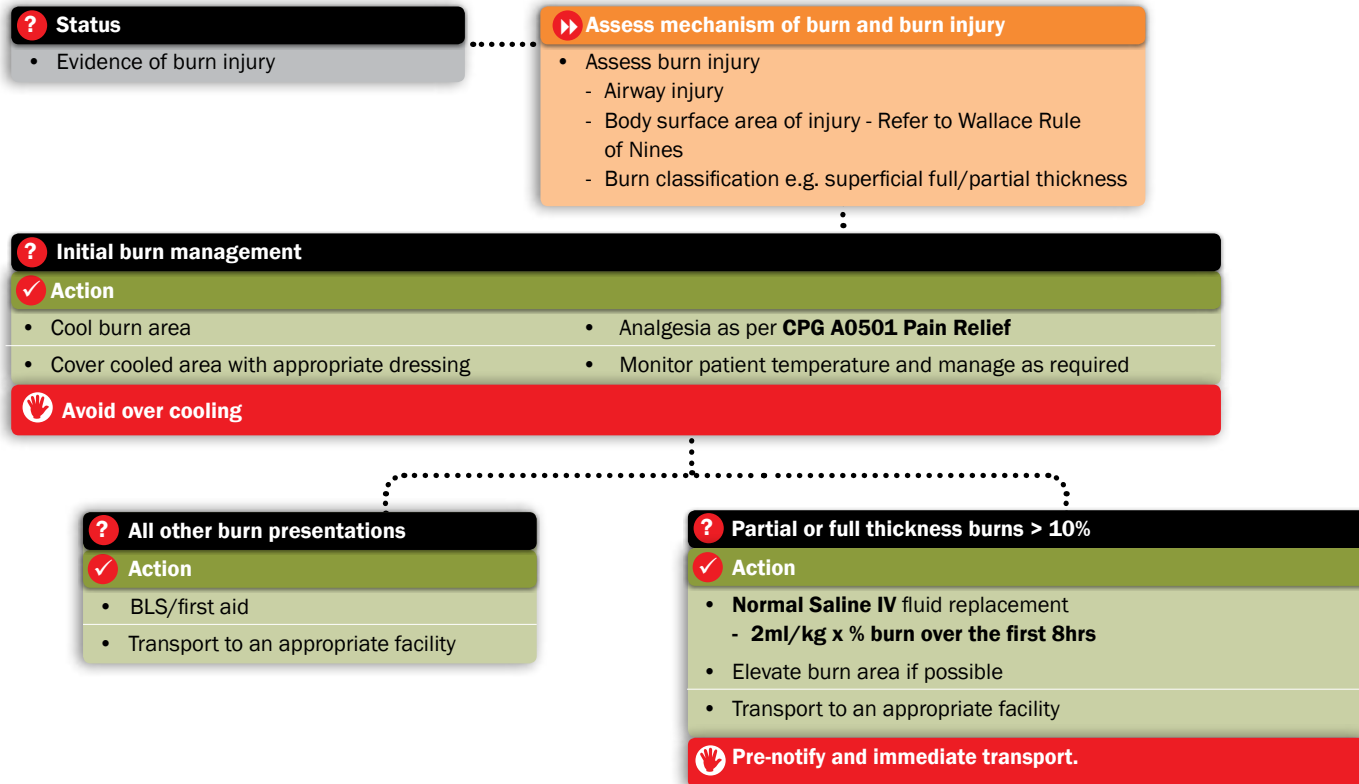
- Cool burn area for preferably up to 20 mins
  - Running water if possible
  - Normal Saline or wet combine as substitute
  - Avoid/eliminate shivering
  - Avoid ice or ice water

### AVOID OVER COOLING

- Cover cooled area with appropriate dressing
  - Ensure cling wrap is applied longitudinally to allow for swelling.
- Assess Pt temp. and manage as required.
- Caution when considering fluid replacement for Pt with airway burns. Fluid therapy can lead to extensive systemic oedema and airway compromise. Consider early intubation.
- Volume replacement is for burn injury only. Manage other injuries accordingly including requirement for additional fluid.
- Consider additional fluid for major electrical burn.

# Adult Burns

## CPG A0805







# Fracture Management

**CPG A0806**

## Principles of Fracture Management

- **General principles for Fracture Management**
  - Control external haemorrhage
  - Support the injured area
  - Immobilise the joint above and below the fracture site
  - Evaluate and record neurovascular condition distal to the fracture site
- Provide appropriate pain relief and correct hypovolaemia.
- Appropriate splinting can assist in pain reduction and arrest of haemorrhage.
- **Before and after splinting**
  - Realign long bone fractures in as close to normal position as possible.
  - Open fractures with exposed bone should be irrigated with a sterile **Normal Saline** prior to realignment and splinting.
  - If joints are involved there is an increased possibility of neurovascular impairment and reduction is not recommended.
  - Femoral shaft fractures and fractures of the upper 2/3 of the tibia and fibula should be managed with a traction splint unless there are distal dislocations or fractures.
- In suspected fractures of the pelvis the legs should be anatomically splinted together (to internally rotate the feet) and the pelvis splinted with a sheet wrap or other appropriate device.
- **Pts who meet major trauma criteria are time critical but appropriate splinting should be considered part of essential Ambulance management and should not be compromised in order to decrease time at scene.**

# Crush Syndrome

**CPG A0807**

## Special Notes

If compressive injury less than 30 mins or involving torso and head, remove immediately.

If compressive force to limb greater than 30 mins, establish IV access and commence 500 ml **Normal Saline** and cardiac monitor prior to removal of force

Indications for administration of Sodium Bicarbonate

- Progressive widening of QRS complexes

# Crush Syndrome

## CPG A0807

### ? Status

- Suspected crush syndrome

### » Assess

- Continuous cardiac monitoring
- Progressive widening of QRS

⋮

### ✓ Action prior to removal of crushing force

- Supplemental O<sub>2</sub>
- Establish IV access. Commence 500ml **Normal Saline**
- Pain Relief as per **CPG A0501 Pain Relief**
- Look for and manage haemorrhage
- If inadequately perfused manage as per **CPG A0801 Inadequate Perfusion Associated with Hypovolaemia**
- If Hyperkalaemia suspected administer **50ml Sodium Bicarbonate 8.4% IV**
- Continue fluid regime as above

# Diving Emergency

## CPG A0808

### Special Notes

#### **Barotrauma / Gas Embolus**

- Arises from gas expansion in body cavities
  - Check for pneumothorax and manage as per **CPG A0802 Chest Injuries**
- Assess for **Cerebral Artery Gas Embolus (CAGE)** – sudden LOC or other CNS symptoms at surface after rapid ascent

#### **Decompression Sickness (DCS)**

- DCS arises from
  - More gradual onset, usually post dive. Consider this for any Pt developing symptoms within 0 - 36hr of diving
  - Pt may present with; generalised aches, headache, SOB, rash, joint pain, paresthesia, paralysis, seizures, unconscious

### Special Notes

- Assess all other divers on scene

# Diving Emergency

## CPG A0808

### ? Status

- Possible diving emergency

### » Assess

- Mechanism of diving emergency
- Respiratory status
- Check for Pneumothorax
- GCS

⋮

### ✓ Action

- Medical Consult required in order to notify appropriate hospital
- Keep Pt flat
- Fluid resuscitation - **Normal Saline 1000ml** then **Medical Consult**
- Tx AVOID HIGH ALTITUDES
- Pain Relief as per **CPG A0501 Pain Relief**











# Hypothermia/Cold Exposure

## CPG A0901

### Special Notes

- Hypothermia is insidious and rarely occurs in isolation. Where the Pt is in a group environment other members of the group should be carefully assessed for signs of hypothermia.
- Arrhythmia in hypothermia is associated with temp. below 33°C.
- Atrial arrhythmias, bradycardia, or atrioventricular block do not generally require treatment with anti-arrhythmic agents unless decompensated, and resolve on rewarming.
- Defibrillation and cardioactive drugs may not be effective at temp. below 30°C. VF may resolve spontaneously upon rewarming.
- The onset and duration of drugs is prolonged in hypothermia and the interval between doses is therefore doubled, for example doses of **Adrenaline** become 8 minutely.
- Gentle handling of this PT is essential. Position flat or lateral and avoid head up position.

### General Care

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

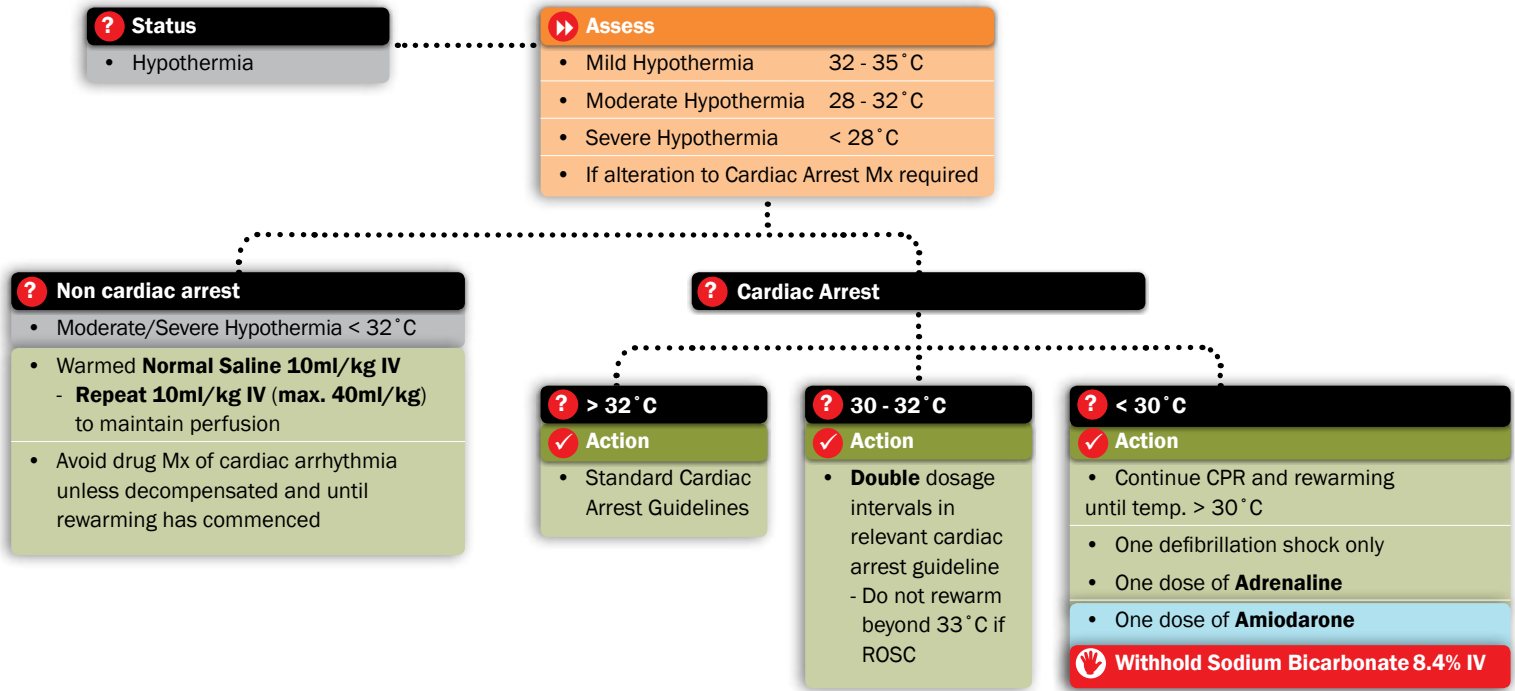
### Warmed fluid

- Normal Saline warmed between 37 - 42°C should be given to correct moderate / severe hypothermia and maintain perfusion if available. Fluid < 37°C could be detrimental to Pt.

The use of aural or oral thermometers may be limited in assessing a patient in a Hypothermic emergency

# Hypothermia/Cold Exposure

## CPG A0901



# Environmental Hyperthermia Heat Stress

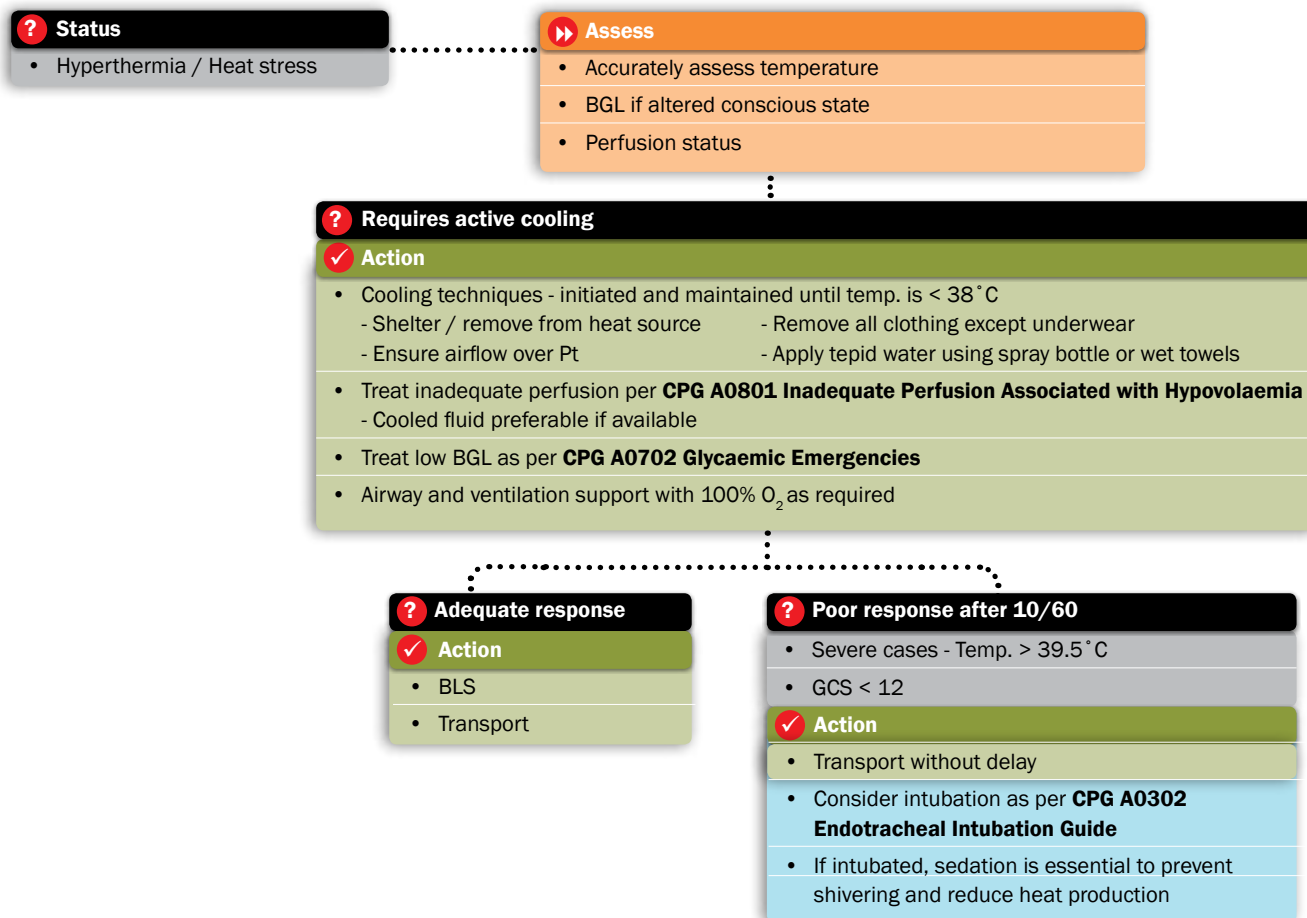
**CPG A0902**

## General Care

- During cooling, Pt should be monitored for the onset of shivering. Shivering may increase heat production and cooling measures should be adjusted to avoid its onset.

# Environmental Hyperthermia Heat Stress

## CPG A0902













# Post Partum Haemorrhage

**CPG A0903**

## Special Notes

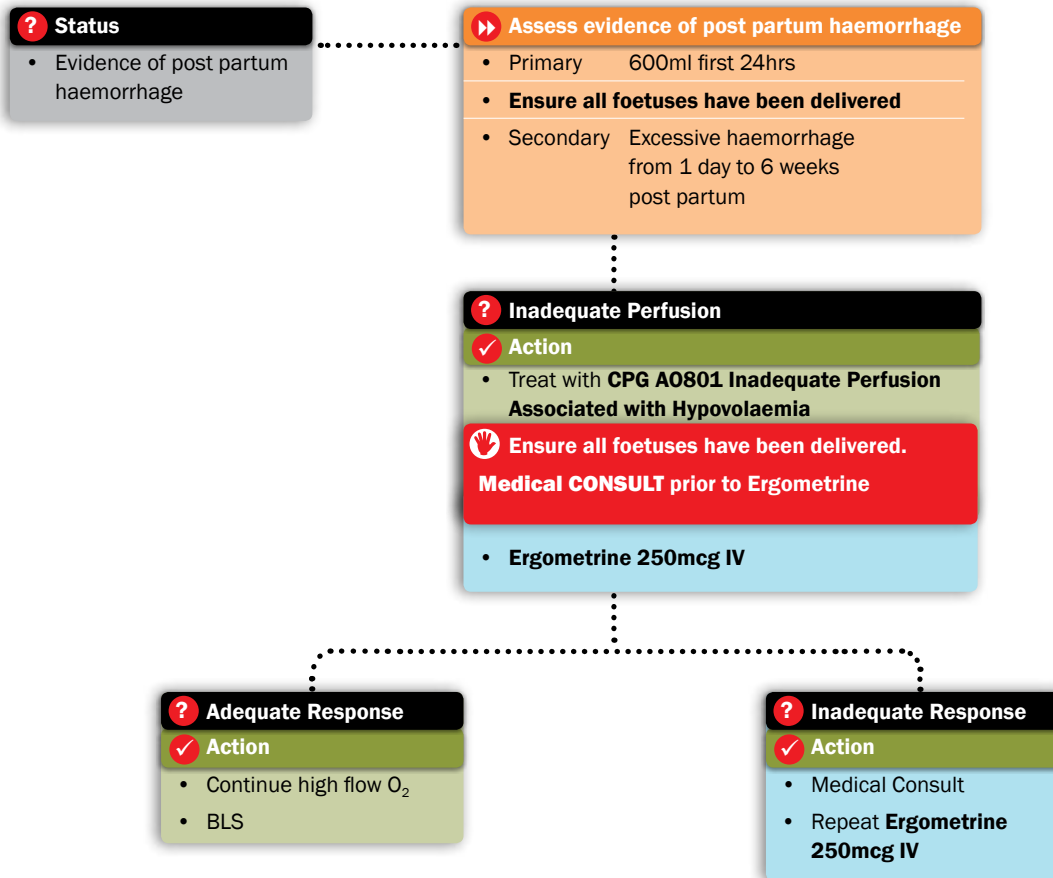
- Uterus can not contract with placenta in situ or in presence of a full bladder. Actions must be initiated to resolve these conditions to assist with haemorrhage control.

## General Care

- Before administration of **Ergometrine** ensure **Medical Consult**
- Before administration of **Ergometrine** ensure that all foetuses have delivered.
- Ergometrine is contraindicated in patients of Hx of pre-eclampsia (PIH) or Hx of hypertension.

# Post Partum Haemorrhage

## CPG A0903



# Eclampsia

# CPG A0904

## Special Notes

- Pre eclamptic women are extremely sensitive to outside stimuli and should be managed in a calm, dark and quiet environment.
- Pre-eclampsia and Eclampsia is a time critical emergency requiring early diagnosis, intervention and prompt transport to reduce peri-natal and maternal mortality
- Signs and symptoms of pre-eclampsia include
  - hypertension BP Systolic >140 and or Diastolic >90
  - headache
  - visual disturbances
  - nausea and/or vomiting
  - dizziness
- Uterine pain and/or PV bleeding may signify abruption
- The most common cause of seizure in pregnancy is pre-existing epilepsy. New onset seizures in the latter half of pregnancy are most commonly Eclampsia
- Seizures may occur during or post birth, usually within 48 hours of birth

## General Care

**CAUTION: Magnesium Sulphate can be supplied in different presentations**

Magnesium Sulphate Infusion

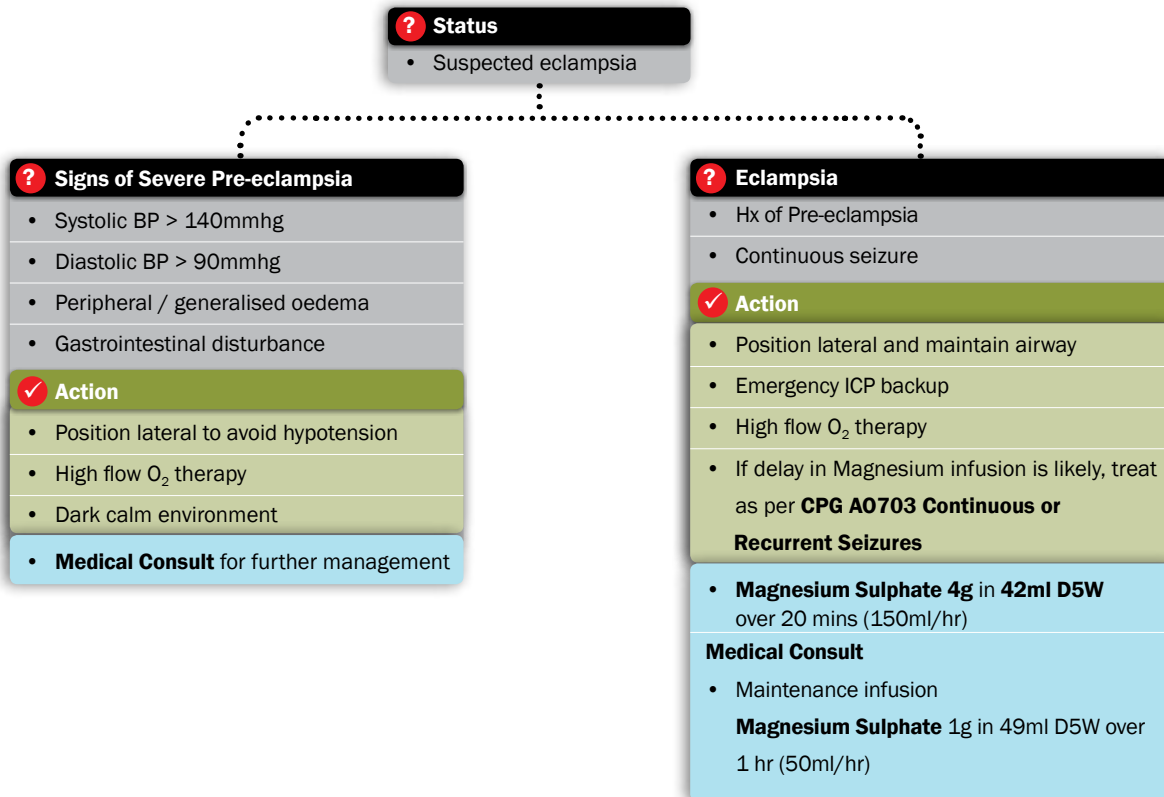
- $\text{MgSO}_4$  4g diluted with 42ml D5W  
Run infusion over 20/60 (150ml / hr)

An early sign of toxicity following Magnesium Sulphate infusion is the loss of deep tendon reflexes.

If the loss of deep tendon reflexes is evident, **Magnesium Sulphate Infusion** must be paused immediately.

# Eclampsia

## CPG A0904















# The Paediatric Patient

## CPG P0101

### Special Notes

- For children up to the age of 12, drug doses are quoted on a dose per kilo basis.
- Patients over 12 years are generally considered adults.
- The body mass to body surface area ratio (body mass index) and the fat-carbohydrate-protein make-up of the child and developing young adolescent is different to that of an adult.
- Preterm is classified as under 37 week's gestation, or approximately 1,000g-1,500g. Neonates less than 1,000g often require substantially modified drug doses; consult prior to commencing any pharmacological treatment.

# The Paediatric Patient

## CPG P0101

### Normal Values

#### 1. Definitions

<b>Newborn</b>	Birth to first few hours of life
<b>Infant</b>	First few hours to one year
<b>Young child</b>	1 – 8 years
<b>Older child</b>	9 – 12 years

#### 2. Paediatric Weight Calculation

For children the doses of drugs, DC shock and fluid therapy are based on body weight. If the body weight is unknown, it can be estimated from the child's age using the following:

<b>Newborn</b>	3.5kg
<b>5 months</b>	7kg
<b>1 year</b>	10kg
<b>1 – 9 years</b>	$\text{age} \times 2 + 8\text{kg}$
<b>10 – 12 years</b>	$\text{age} \times 3.3\text{kg}$

Refer to the Paediatric Tables for calculations of estimated body weight for specific ages.

# The Paediatric Patient

## CPG P0101

### Perfusion status assessment

#### 1. Normal Blood Volume

Newborn	– approximately 80ml/kg
Infant and child	– approximately 70ml/kg

#### 2. Definition and Observations

Same as for adults

#### 3. Criteria

##### a) Adequate Perfusion

Age	Pulse	Blood Pressure
Newborn	120 – 160	N/A
Infant	100 – 160	> 70mmHg systolic
Small child	80 – 120	> 80mmHg systolic
Large child	80 – 100	> 90mmHg systolic

- Skin – warm, pink, dry
- Conscious, alert, active

# The Paediatric Patient

## CPG P0101

### Perfusion status assessment

#### b) Inadequate Perfusion

Age	Pulse	Blood Pressure
Newborn	<100/ or > 170	N/A
Infant	< 90/ or > 170	< 60mmHg systolic
Small child	< 75/ or > 130	< 70mmHg systolic
Large child	< 65/ or > 100	< 80mmHg systolic

- Skin – cool, pale, clammy, peripheral cyanosis.
- Altered conscious state, restless

#### c) No Perfusion

- Absence of palpable pulses
- Skin – cool, pale
- Unrecordable blood pressure
- Unconscious

### Respiratory status assessment

#### 1. Normal Respiratory Rates

<b>Newborn</b>	40 – 60 breaths/min
<b>Infant</b>	20 – 50 breaths/min
<b>Small child</b>	20 – 35 breaths/min
<b>Large child</b>	15 – 25 breaths/min

#### 2. Definition and Observations

Same as for adults
--------------------

#### 3. Criteria

##### a) Signs of respiratory distress include:

- tachypnoea
- use of accessory muscles
- grunting
- pallor
- wheezing
- cyanosis (late sign)
- chest wall retraction
- abdominal protrusion

## Respiratory status assessment

### b) Signs of Hypoxia include:

#### Infants

- lethargy
- bradycardia
- hypotension
- apnoea
- pallor

#### Children

- restlessness
- tachypnoea
- tachycardia (bradycardia late sign)
- cyanosis

### c) Carbon dioxide retention is manifested by:

- sweating (uncommon in infants)
- tachycardia
- pupillary dilatation
- hypertension
- bounding pulse
- eventually leading to cardiovascular and central nervous system depression

Respiratory failure is common in the first two years of life. Small calibre airways are prone to obstruction. Respiratory distress may reflect disorder of other body systems – cardiac failure, abdominal distension, neurological problems.



# The Paediatric Patient

## CPG P0101

### Conscious State Assessment (Glasgow Coma Scale)

#### Child ≤ 4 years

A. Eye Opening	Score	Eye Opening	Score
Spontaneous	4	Spontaneous	4
Reacts to speech	3	To voice	3
Reacts to pain	2	To pain	2
None	1	None	1

B. Best Verbal Response	Score	Best Verbal Response	Score
Appropriate words or social smile, fixes, follows	5	Orientated	5
Cries but consolable	4	Confused	4
Persistently irritable	3	Inappropriate words	3
Restless and agitated	2	Incomprehensible sounds	2
None	1	None	1

C. Best Motor Response	Score	Best Motor Response	Score
Spontaneous	6	Obeys command	6
Localises to pain	5	Localises to pain	5
Withdraws from pain	4	Withdraws (pain)	4
Flexion response	3	Flexion (pain)	3
Extension response	2	Extension (pain)	2
None	1	None	1

( A + B + C ) =

( A + B + C ) =

**Total GCS (Max. Score = 15)**

# The Paediatric Patient

## CPG P0101

### APGAR Scoring System

The APGAR score should be conducted 1min. after delivery and repeated at 5min. after delivery. A score of:

**7 – 10** Satisfactory

**4 – 6** Moderate depression and may need respiratory support

**0 – 3** Newborn requiring resuscitation

	0 points	1 point	2 points
<b>Appearance</b>	Blue, pale	Body pink, extremities blue	Totally pink
<b>Pulse</b>	Absent	< 100	> 100
<b>Grimace</b>	None	Grimaces	Cries
<b>Activity</b>	Limp	Flexion of extremities	Active motion
<b>Respiratory effort</b>	Absent	Slow and weak	Good strong cry

# The Paediatric Patient

## CPG P0101

### Paediatric Pain Assessment

Paediatric pain assessment should be appropriate to the developmental level of the child. Pain can be communicated by words, expressions and behaviour such as crying, guarding a body part or grimacing. The QUESTT principles of pain (Baker and Wong, 1987) may be helpful in assessing paediatric pain.

**Q**uestion the child

**U**se pain rating scales

**E**valuate behaviour and physiological changes

**S**ecure parent's involvement

**T**ake cause of pain into account

**T**ake action and evaluate results

The following pain rating scales may be useful when assessing pain in children.

### FLACC Scale

This is a behaviour scale that can be used for children less than 3 years of age or who are unable to communicate. Each of the five categories below is scored from 0 – 2 and the scores are added to get a total from 0 – 10. Behavioral pain scores need to be considered within the context of the child's psychological status, anxiety and other environment factors.

Paediatric Pain Assessment

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

The FLACC is a behaviour pain assessment scale which is reproduced with permission of University of Michigan Health System and Ambulance Victoria for clinical use by Ambulance Tasmania.

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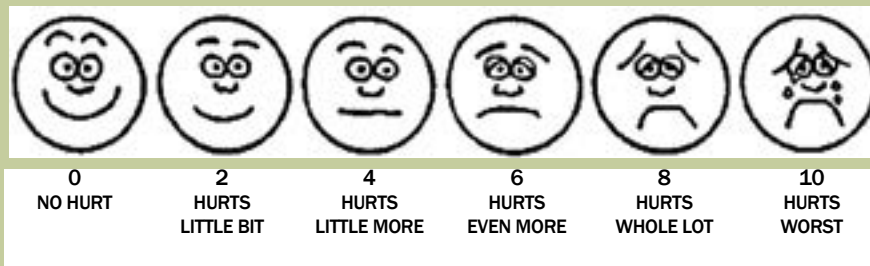
# The Paediatric Patient

## CPG P0101

### Paediatric Pain Assessment

#### Wong – Baker Faces Pain Rating Scale

This scale can be used with young children aged 3 years and older and may also be useful for adults and those from a non-English-speaking background. Point to each face using the words to describe the pain intensity. Ask the child to choose the face that best describes their own pain and record the appropriate number.



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

#### Verbal Numerical Rating Scale

This scale asks the Pt to rate their pain from “no pain” (0) to “worst pain possible” (10) and is suitable for use in children over 6 years of age who have an understanding of the concepts of rank and order. Avoid using numbers on this scale to prevent the Pt receiving cues. Some Pt's are unable to use this scale with only verbal instructions but may be able to look at a number scale and point to the number that describes the intensity of their pain.

# The Paediatric Patient

## CPG P0101

### Orogastric Tube (Paediatric)

An orogastric tube may be inserted to relieve gastric distension:

- < 4 years      12 FG
- > 4 years      14 FG

### Alternative Route for Drug Administration Endotracheal Route

The following drugs can be administered safely and effectively by the endotracheal route:

- **Adrenaline**

**Do not administer any other drugs by this route.**

#### To administer drugs via the endotracheal route:

- Place an approved catheter down to the end of the endotracheal tube
- Spray the appropriate volume of the desired solution down the catheter
- Flush the suction catheter using **Normal Saline**

to ensure the proper dose of active drug reaches the airway mucosa

- Follow the administration of the drug with five forceful ventilations.

### Adult

The ETT route is thought to be less effective than the IV route. All ETT drugs should be diluted with **Normal Saline** to make 10ml.

### Paediatric

The drugs should be diluted with **Normal Saline** as required and the total volume administered via the ETT route should not exceed:

- newborn and infants      1ml
- small child                      5ml
- large child                      10ml

**For Adrenaline, the ETT dose is 10 times the initial IV dose, i.e. 10 x 0.01mg/kg in 1:1000 dilution (0.1 mg/kg), diluted as above.**

### Intraosseous Route

The use of the intraosseous route is justified in all age groups in circumstances where lifesaving intravenous drugs and/or fluid are required and intravenous access is not possible. This would include where ETT is indicated and sedation/paralysis pre or post ETT is required and timely intravenous access is not possible.

### Contraindications

- If any part of the limb is traumatised or infected
- The proposed site cannot be adequately cleansed

### Precautions

- Care should be taken not to inject air
- Beware of extravasation

### Complications

- Necrosis of surrounding soft tissue due to extravasation
- Infection of bony tissue

**Note:** The proximal tibial site is preferred in adults and children 4 years and older





# Paediatric Chart

# CPG P0102

## Paediatric Chart

Age		0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs
Weight		3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg
Resps	Normal lower limit	40	20	20	20	20	20	20	20	20	20	20	15	15	15	15	/min.
Resps	Normal upper limit	60	50	50	35	35	35	35	35	35	35	35	25	25	25	25	/min.
Pulse	Inadequate perfusion	< 100	< 90	< 90	< 75	< 75	< 75	< 75	< 75	< 75	< 75	< 75	< 65	< 65	< 65	< 65	/min.
Pulse	Normal lower limit	120	100	100	80	80	80	80	80	80	80	80	80	80	80	80	/min.
Pulse	Normal upper limit	160	160	160	120	120	120	120	120	120	120	120	100	100	100	100	/min.
Pulse	Inadequate perfusion	> 170	> 170	> 170	> 130	> 130	> 130	> 130	> 130	> 130	> 130	> 130	> 100	> 100	> 100	> 100	/min.
BP/Sys	Normal lower limit	NA	> 70	> 70	> 80	> 80	> 80	> 80	> 80	> 80	> 80	> 80	> 90	> 90	> 90	> 90	mmHg
BP/Sys	Inadequate perfusion	NA	< 60	< 60	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 80	< 80	< 80	< 80	mmHg
ETT	Internal diameter	3.0	3.0	3.5	4.0	4.5	5.0	5.0	5.5	5.5	6.0	6.0	6.5	6.5	7.0	7.0	mm
ETT	Length at lips	9.5	9.5	11	12	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	18	cm
Naso/Orogastric Tube		12	12	12	12	12	12	12	14	14	14	14	14	14	14	14	FG
Suction Catheter for ETT		6	6	8	8	8	8	8	8	8	8	10	10	10	10	10	FG
DCCS Biphasic	4 joules/kg	15	20	30	50	50	50	50	50	100	100	100	100	150	150	170	

# Paediatric Chart

# CPG P0102

## Resuscitation drugs

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs	Guideline	
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg		
<b>Adrenaline 1:1,000</b> <b>neb.</b>	For all ages add 5ml to nebuliser																	Upper Airway oedema
<b>Adrenaline 1:1,000</b> <b>10mcg/kg</b>	0.035	0.05	0.07	0.1	0.12	0.14	0.16	0.18	0.2	0.22	0.24	0.26	0.33	0.36	0.4	ml	Anaphylaxis, Asthma	
	35	50	70	100	120	140	160	180	200	220	240	260	330	360	400	mcg		
1mg/1ml (1mg=1ml)	1ml syringe																	
<b>Adrenaline 1:1,000</b> <b>10mcg/kg</b>	use 1:10,000			0.1	0.12	0.14	0.16	0.18	0.2	0.22	0.24	0.26	0.33	0.36	0.4	ml	Anaphylaxis, Asthma	
	35	50	70	100	120	140	160	180	200	220	240	260	330	360	400	mcg		
1mg/1ml (1mg=1ml)	1ml syringe																	
<b>Adrenaline 1:10,000</b> <b>10mcg/kg</b>	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	ml	Cardiac Arrest	
	35	50	70	100	120	140	160	180	200	220	240	260	330	360	400	mcg		
1mg/10ml (1mg=10ml)						10ml syringe										<b>ETtx10</b>		
<b>Adrenaline 1:10,000</b> <b>10mcg/kg</b>	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	ml	ICP Anaphylaxis, Asthma	
	35	50	70	100	120	140	160	180	200	220	240	260	330	360	400	mcg		
1mg/10ml (1mg=10ml)	1ml syringe					10ml syringe												
ETT Drug Dilution Volume	1ml						3 - 5ml						5 - 10ml					
<b>Sodium Bicarbonate 8.4%</b> <b>1ml/kg</b>	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	ml	Cardiac Arrest TCA OD (2ml/kg)	
<b>2ml/kg</b>	7	10	14	20	24	28	32	36	40	44	48	52	66	72	80	ml		
	50ml syringe																	
<b>Amiodarone</b> <b>5mg/kg</b>	1.75	2.5	3.5	5	6	7	8	9	10	Different dilution suggested for > 6 yr.						ml	VF/ VT Arrest	
100mg/10ml (See across for dilution info) (10mg = 1ml)	17.5	25	35	50	60	70	80	90	100							mg		
	Dilution info: Add 2ml (100mg) Amiodarone (from 150ml in 3ml ampoule) to 8ml Dextrose in a 10ml syringe																	
<b>Amiodarone</b> <b>5mg/kg</b>	Different dilution suggested for < 6 yr.									2.2	2.4	2.6	3.3	3.6	4	ml	VF/ VT Arrest	
										110	120	130	165	180	200	mg		
150mg/3ml (50mg=1ml)										10ml syringe								
Syringe Scales	1ml/0.01ml increments						2.5ml/0.1ml increments						10ml/0.2ml increments				50ml/1ml increments	

\* 0.1 has been made a minimum vol. to reduce dosage error. The minimum vol. is sometimes different to the prescribed dose and should be recorded/handed over as the dose delivered

# Paediatric Chart

# CPG P0102

## Ceftriaxone and Dextrose

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Guideline
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	
Ceftriaxone (IM) 50mg/kg 1g diluted with 3.5ml 1% Lignocaine (1ml = 250mg)	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	Meningococcal Disease
	175	250	350	500	600	700	800	900	1000	1100	1200	1300	1650	1800	2000	
	1ml syringe		3ml syringe				10ml syringe									
Ceftriaxone (IM) 100mg/kg 1g diluted with 9.5ml Water for Injection (1ml = 100mg)	1.75	2.5	3.5	5.0	6.0	7.0	8.0	9.0	10	10	10	10	10	10	10	Meningococcal Disease
	350	500	700	1000	1200	1400	1600	1800	2000	2000	2000	2000	2000	2000	2000	
	10ml syringe															
Glucose 10% 5ml/kg	17.5	25	35	50	60	70	80	90	100	110	120	130	165	180	200	Hypoglycaemia
	Use a 50ml syringe or infusion depending on volume to be delivered															

# Paediatric Chart

## CPG P0102

### Midazolam, Morphine, Naloxone and Ketamine

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs	Guideline
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg	
<b>Midazolam (IM/IV) 0.15mg/kg</b> 5mg/1ml (1mg=0.2ml)	0.1	0.15	0.2	0.3	0.36	0.42	0.48	0.54	0.6	0.66	0.72	0.78	1.0	1.1	1.2	ml	Seizures
	0.5	0.75	1.0	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	5.0	5.4	6.0	mg	
	1ml syringe													2ml syringe			
<b>Midazolam (IM) 0.1mg/kg</b> 5mg/1ml (1mg=0.2ml) Maximum dose shown	0.07	0.1	0.14	0.2	0.24	0.28	0.32	0.36	0.4	0.44	0.48	0.52	0.66	0.72	0.8	ml	Sedation for Overdose
	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	mg	
	1ml syringe																
<b>Midazolam (IV) 0.1mg/kg</b> 5mg/1ml (1mg=0.2ml) Maximum dose shown	0.07	0.1	0.14	0.2	0.24	0.28	0.32	0.36	0.4	0.44	0.48	0.52	0.66	0.72	0.8	ml	Sedation for Overdose
	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	mg	
	1ml syringe																
<b>Morphine (IM) 0.1mg/kg</b> 10mg/1ml	0.04	0.05	0.07	0.1	0.12	0.14	0.16	0.18	0.2	0.22	0.24	0.26	0.33	0.36	0.4	ml	Pain Relief
	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	mg	
	1ml syringe																
CAUTION IM Morphine dose should never exceed 0.5ml																	
<b>Morphine (IV) 0.05mg/kg</b> 10mg/1ml dilute to 10ml (1ml = 1mg)	0.18	0.25	0.35	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.65	1.8	2.0	ml	Pain Relief
	0.18	0.25	0.35	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.65	1.8	2.0	mg	
	Dilution info: Add 10mg/1ml to 9ml Normal Saline. (1ml = 1mg)																
<b>Naloxone (IM) 10mcg/kg</b> 400mcg/1ml	0.1	0.125	0.175	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.825	0.9	1	ml	Narcotic Overdose
	40*	50	70	100	120	140	160	180	200	220	240	260	330	360	400	mcg	
	1ml syringe																
<b>Ketamine (IV) 0.5mg/kg</b> 200mg/2ml dilute with 8ml to 200mg in 10ml (20mg = 1ml)	0.09	0.13	0.18	0.25	0.30	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.85	0.9	1.0	ml	Pain Relief Severe Trauma Uncontrolled Pain Severe Burns
	1.8	2.5	3.5	5.0	6.0	7.0	8.0	9.0	10	11	12	13	16.5	18	20	mg	
	10ml syringe																

# Paediatric Chart

## CPG P0102

### Normal Saline, Salbutamol and Dexamethasone

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs	Guideline
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg	
Normal Saline 20ml/kg	70	100	140	200	240	280	320	360	400	440	480	520	660	720	800	ml	Hypovolaemia, asthma, arrest, anaphylaxis
	Use a 50ml syringe or infusion depending on volume to be delivered																
Salbutamol (IV) 500mcg/1ml dilute to 10ml (1ml=50mcg)  2.5mcg/kg	0.35	0.5	0.7	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	4	ml	Asthma
	17.5	25	35	50	60	70	80	90	100	110	120	130	165	180	200	mcg	
	0.18	0.25	0.35	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.65	1.8	2	ml	
	8.75	12.5	17.5	25	30	35	40	45	50	55	60	65	82.5	90	100	mcg	
	10ml syringe																
Add 1ml (500mcg) Salbutamol to 9ml Normal Saline in a 10ml syringe																	
Dexamethasone (IV) 8mg in 2ml  0.6mg/kg	0.52	0.75	1.05	1.5	1.8	2.1	2.4	2.7	3	3	3	3	3	3	3	ml	Asthma, Anaphylaxis
	2.1	3	4.2	6	7.2	8.4	9.6	10.8	12	12	12	12	12	12	12	mg	
	1ml syringe		2.5ml syringe					5ml syringe									
Magnesium (IV infusion) 50mg/kg 2.47g in 5ml Add to 50ml 5% glucose and run infusion over 20 min (150ml/hr)	N/A	N/A	N/A	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	3.3	3.6	4.0	ml	Asthma
	N/A	N/A	N/A	500	600	700	800	900	1000	1100	1200	1300	1650	1800	2000	mg	
	100 ml 5% glucose																











# Cardiac Arrest (Paediatric)

## CPG P0201

### Causes and resuscitation principles

- Cardio-respiratory arrest in infants and children is most commonly caused by hypoxaemia, hypotension or both, and should be suspected when the child or infant loses consciousness, appears pale or cyanosed or is apnoeic or pulseless. Examples of conditions causing cardiac arrest in infants and children are trauma, drowning, septicaemia, sudden infant death syndrome, asthma, upper airway obstruction and congenital abnormalities of the heart and lungs.
- Infants and children most commonly arrest into severe bradycardia or asystole. VF may occur associated with congenital heart conditions or secondary to poisoning to cardioactive drugs and is often encountered during the course of resuscitation. Respiratory arrest may occur alone but if treated promptly may not progress to cardio-respiratory arrest.
- Resuscitation is directed at adequate airway control, ventilation, chest compressions and **Adrenaline**.
- The basic principles of paediatric life support are similar to those of adults. However, drug dosages are usually related to body weight and some procedures need to be adapted for differences in paediatric anatomy. Older children may be treated as per adult Guidelines but it should be noted that they do not have the same susceptibility to VF.

### Airway and breathing

- To assess an airway in a newborn, infant or child, the positioning and techniques are similar to those for an adult with the exception that care should be taken to avoid over extension of the neck and head. Noisy breathing, stridor or wheeze and/or neck and chest soft tissue retraction on inspiration are signs of significant partial airway obstruction.
- To position the head and neck to maintain an open airway:
  - **Newborn and infants:** head and neck should be placed in the neutral position, avoiding additional neck flexion and head extension.
  - **Children:** use neck flexion and head extension with caution in the younger child.
- If necessary use chin lift or jaw thrust to clear the airway. The pharynx should be inspected with a laryngoscope and cleared of secretions using a Yankauer sucker. Magill forceps may be needed to remove a foreign body.
- If spontaneous ventilation is not present, an appropriate size OPA should be inserted and assisted ventilation should be commenced immediately. **Effective airway control and adequate ventilation with oxygen supplementation is the keystone of paediatric resuscitation.**

# Cardiac Arrest (Paediatric)

# CPG P0201

## External Cardiac Compression (ECC)

- Commence (ECC) if:
  - **No palpable pulse (carotid, brachial or femoral) or**
  - **HR < 60 (infants) or**
  - **HR < 40 (children)**
- Depth of Compression/Method of Compression
  - Approximately 1/3 the depth of the chest for all age groups. Approximately 50% of a compression cycle should be devoted to compression of the chest and 50% to relaxation.

### Newborn and Infant

- Two fingers or by a two-thumb technique. In this latter technique, the hands encircle the chest and the thumbs compress the sternum. This is considered a more effective technique and is the preferred option for two-rescuers. However, care should be taken to avoid restricting chest expansion during inspiration. The two-finger technique should be used by a single rescuer in order to minimise the transition time between ECC and ventilation.

### Child

- One handed technique for small children or two handed technique for larger children as for adults

## Ratios of Compressions to Ventilations

### • Newborn (birth to first few hours a life only)

3:1 (single rescuer)

3:1 (two rescuers)

Rate: Approximately 120 compressions per min.

- No change in ratio if intubated

### • Infants and Children

**(Includes Newborns after first hours of birth)**

#### Not intubated

30:2 (single rescuer)

15:2 (two rescuers)

Rate: Approximately 100-120 compressions per min.

- Pause for ventilations

#### Intubated (ICP)/Supraglottic Airway inserted

15:2

Rate: Approximately 100-120 compressions per min.

- < 14 ventilations/min.

- No pause for ventilations

# Cardiac Arrest (Paediatric)

# CPG P0201

## Principles of CPR

### CPR

- Assumption that CPR is commenced immediately and continued throughout cardiac arrest as required
- Generic for all paediatric cardiac arrest conditions
- Must not be interrupted for more than 10 sec. during rhythm/pulse checks. If unsure of pulse, recommence CPR immediately
- Change operators every 2min to improve CPR performance and reduce fatigue
- **Rhythm/Pulse check every 2min**
- CPR commenced immediately after defibrillation and pulse check after 2min.

### Intraosseous (I/O) insertion

- If delay in IV insertion (> 90 sec) then insert an I/O cannula.

### Automated External Defibrillator

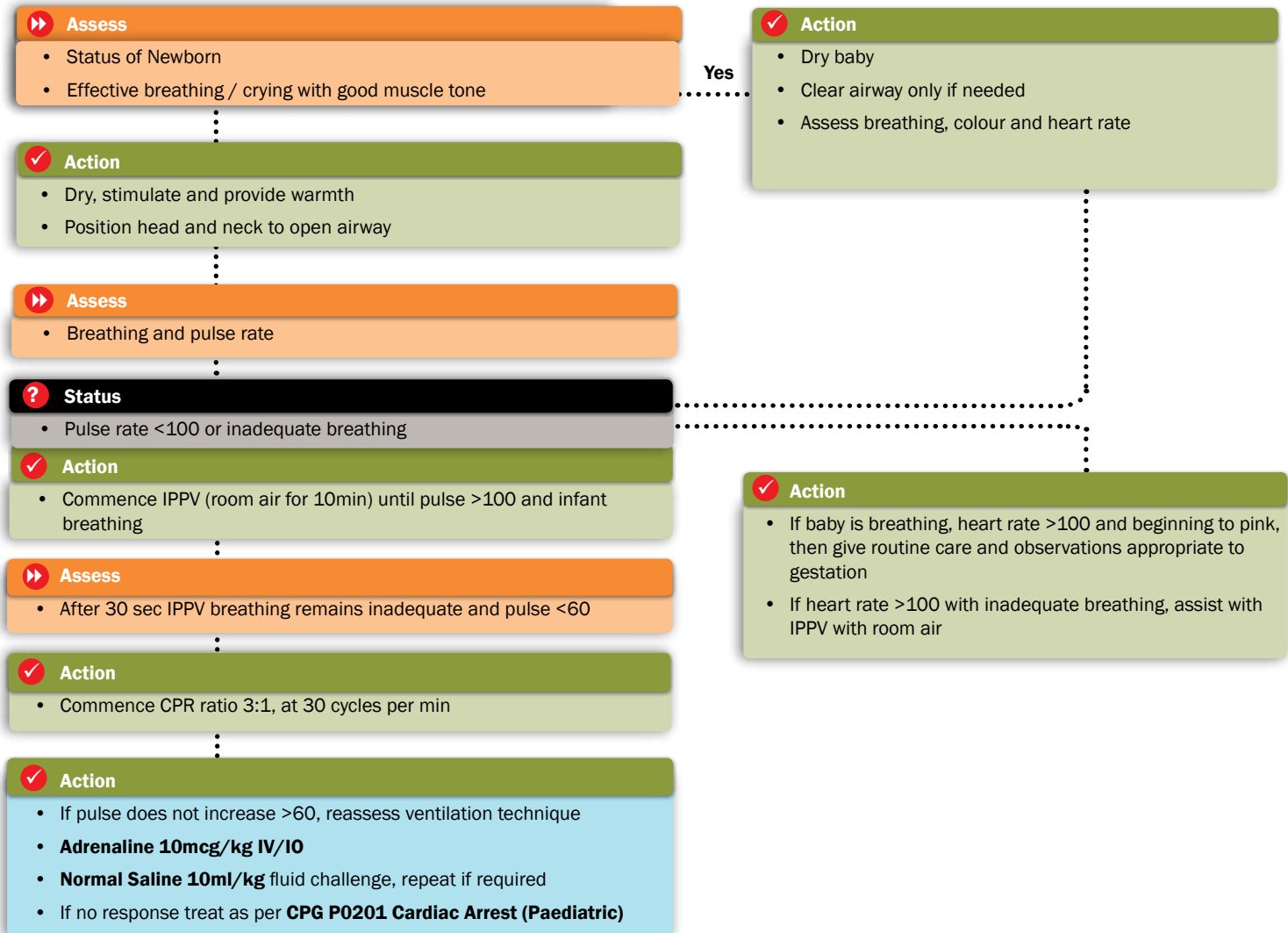
- An Automated External Defibrillator with paediatric adapter is suitable for use in children 1 – 8 years of age. Children over 8 years may be treated with adult preset energy levels.

### Adjustment for temperature

- **> 32°C**
  - Standard Cardiac Arrest Guidelines
- **30 – 32°C**
  - Double dosage intervals in relevant cardiac arrest guideline
  - Do not rewarm beyond 33°C if ROSC
- **<30°C**
  - Continue CPR and rewarming until temp. > 30°C
  - One defibrillation shock only
  - One dose of **Adrenaline**
  - One dose of **Amiodorone**
  - **Withhold Sodium Bicarbonate 8.4% IV**

# Assessment and Management of Newborn Baby

## CPG P0201



# Cardiac Arrest (Paediatric)

## CPG P0201

### ✓ Action

- Immediately commence CPR 30 : 2 single operator, 15 : 2 two operators

### ? Unconscious/Pulseless VF/VT

#### ✓ Action

- Defibrillation  
**4J/kg (Biphasic)**
- Repeat **4J/kg @ 2 mins** if VF/VT persists

### ? Pulseless Electrical Activity (PEA)

#### 🚑 Identify and Rx causes

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

### ? Asystole or Severe Bradycardia

#### ✓ Action

- Commence CPR if either:
  - Pulseless
  - HR < 60 (Infants)
  - HR < 40 (Children)

### ? Unconscious/Pulseless VF/VT

#### ✓ Action

- IV access/**Normal Saline TKVO**
- I/O if delay in IV access
- **Adrenaline 10mcg/kg IV or IO**
- Repeat at **4 min** interval

### ? PEA persists

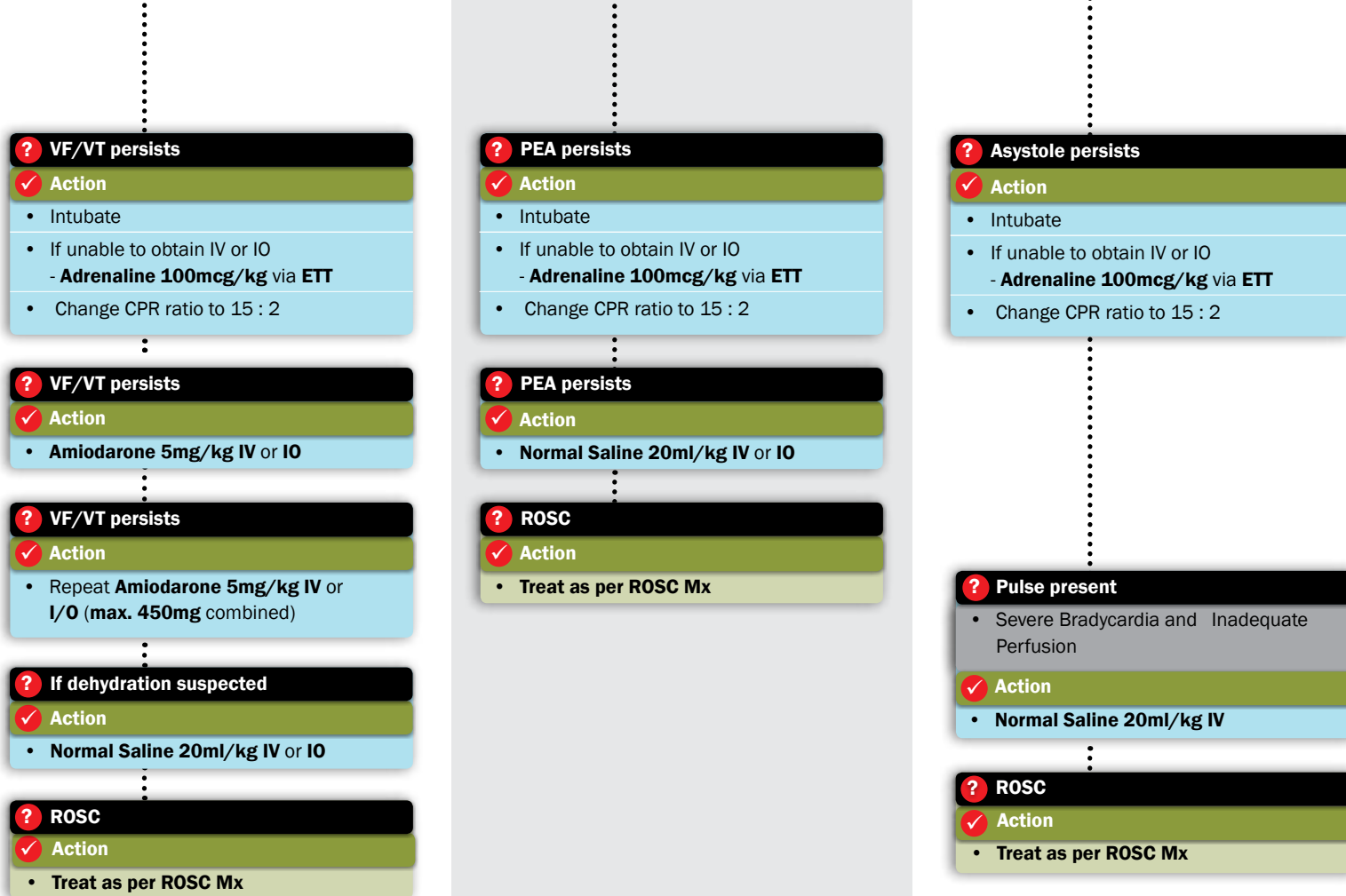
#### ✓ Action

- IV access/**Normal Saline TKVO**
- I/O if delay in IV access
- **Adrenaline 10mcg/kg IV or IO**
- Repeat at **4 min** interval

### ? Asystole or Severe Bradycardia persist

#### ✓ Action

- IV access/**Normal Saline TKVO**
- I/O if delay in IV access
- **Adrenaline 10mcg/kg IV or IO**
- Repeat at **4 min** interval



**Sodium Bicarbonate** may be administered if hyperkalaemia suspected or in cardiac arrest secondary to TCA overdose per **P0707(B) Management of Overdose: (TCA) Paediatric**

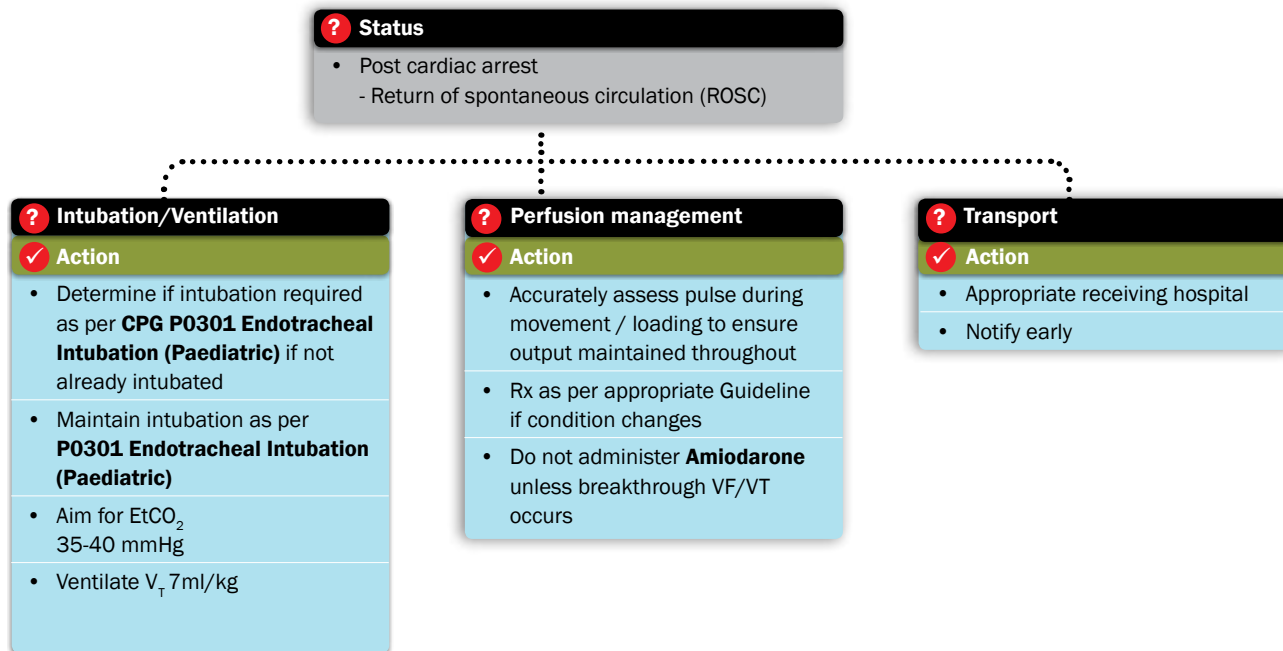
**Magnesium Sulphate, 50mg/kg, max dose of 2g. No repeat dose.**  
should be administered instead of Amiodarone in the event of Torsade de Pointes.





# Cardiac Arrest (Paediatric)

## CPG P0201











# Endotracheal Intubation Guide (Paediatric)

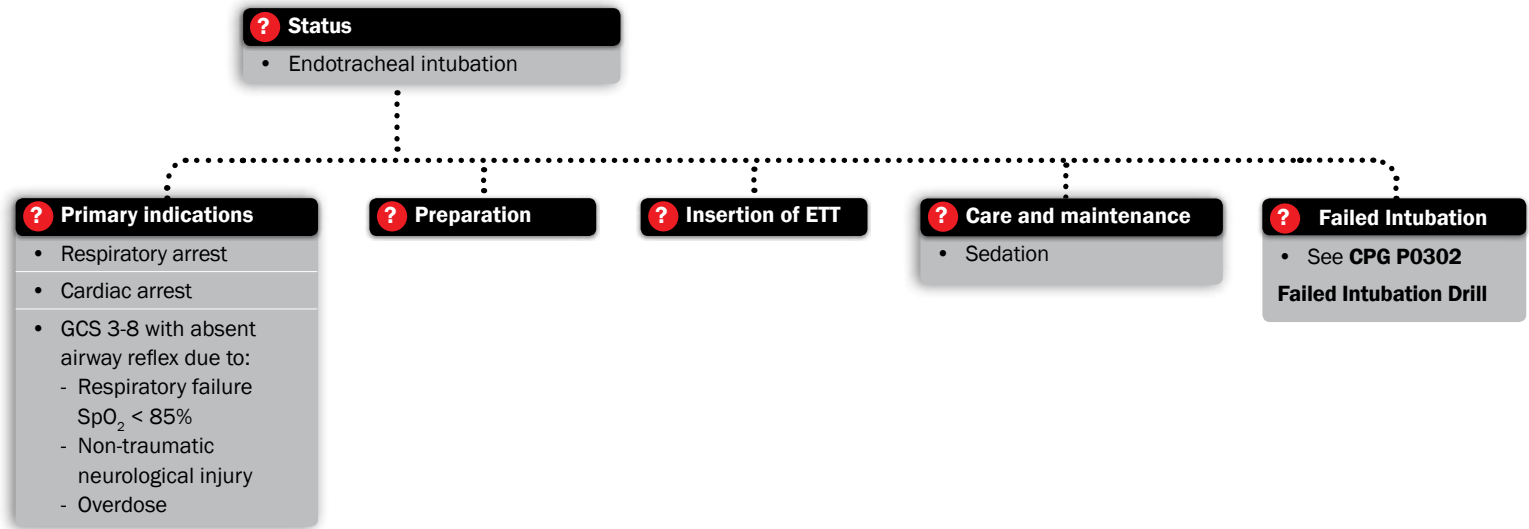
**CPG P0301**

## Special Notes

- All intubations facilitated or maintained with drug therapy will be reviewed as part of AT Clinical governance processes.

# Endotracheal Intubation Guide (Paediatric)

## CPG P0301



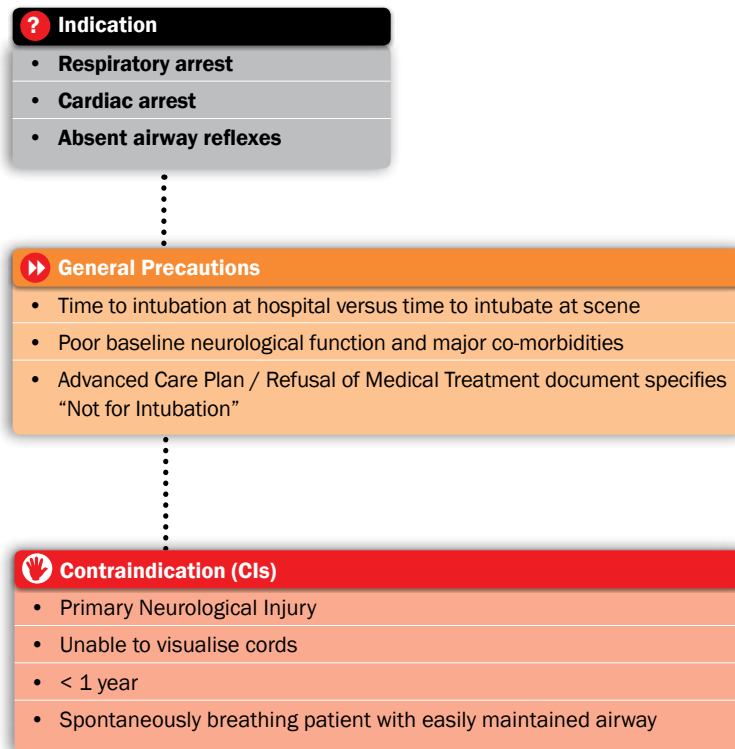
# Endotracheal Intubation Indications, Precautions, CIs (Paediatric) **CPG P0301**

## Special Notes

- **Status epilepticus**
  - Intubation is not desirable in the patient with status epilepticus who are best managed with BVM and OPA / NPA.
- **Uncontrolled bleeding**
  - Airway management with BVM is to be maintained in conjunction with prompt transport. Intubation (without drugs) should be considered if airway reflexes are lost, bearing in mind the risks of delay to definitive surgical care.



# Endotracheal Intubation Indications, Precautions, CIs (Paediatric) CPG P0301



# Endotracheal Intubation Preparation (Paediatric)

## CPG P0301

### Special Notes

Age	Endotracheal Tube Size	Length at Lips
12 months	4.0mm	12.0cm
> 12 months	Age/4 + 4mm	Age/2 + 12cm

- Children under the age of 10 years should be intubated with an uncuffed endotracheal tube – the largest uncuffed ETT available is a size 6.5mm.
- If in doubt, refer to paediatric graph. The correct size tube should allow a small leak around the tube with positive pressure but not so great as to make ventilation inadequate. A closer fitting tube may be necessary when ventilating stiff lungs, e.g. near drowning.

### Special Notes

#### ETT Suction (Paediatric)

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

Suction Catheter Size	ETT Size
6 FG	3mm
8 FG	3.5 – 5.5mm
10 FG	6mm

# Endotracheal Intubation Preparation (Paediatric)

## CPG P0301

### ? General Preparation for Intubation

#### ✓ Action

- Position Pt. If a cervical collar is fitted it should be opened while maintaining manual cervical support
- Pre-oxygenate with 100% O<sub>2</sub> and electronic capnograph attached
- Ensure pulse oximeter and cardiac monitor are functional
- Prepare equipment and assistance
  - Suction
  - ETT (plus one size **smaller** and one size **larger** than predicted immediately available) with introducer
  - Oesophageal Detector Device (ODD).
  - Ensure equipment for a difficult/failed intubation is immediately available, including bougie, supraglottic airway, cricothyroidotomy kit
  - Mark cricothyroid membrane as necessary
  - Brief assistant to provide cricoid pressure, where appropriate
  - If suspected spinal injury, where possible a second assistant should be available to stabilise the head and neck
- Ensure functional and secure IV access

# Endotracheal Intubation Insertion (Paediatric)

# CPG P0301

## Insertion of Endotracheal Tube

- Observe passage of ETT through cords noting AS standard markings and grade of view.
- Check ETT position using Oesophageal Detector Device (ODD).
- Inflate cuff (if applicable)
- Confirm tracheal placement via capnography (note: Pt in cardiac arrest may not have CO<sub>2</sub> initially detectable).
- Exclude right main bronchus intubation by comparing air entry at the axillae.
- Note length of ETT at lips / teeth.
- Auscultate chest / epigastrium.
- Note supplemental cues of correct placement (e.g. tube "misting", bag movement in the spontaneously ventilating Pt, improved oxygen saturation and colour).
- Secure the ETT and insert a bite block.
- **If there is ANY doubt about tracheal placement, the ETT must be removed.**
- If unable to intubate after ensuring correct technique and problem solving then proceed to **CPG P0302 Failed Intubation Drill.**

## General Care of the intubated Pt

- Cervical collars should be placed on all intubated children over the age of 4 where practicable.
- Reconfirm tracheal placement using EtCO<sub>2</sub> after every Pt movement. Disconnect and hold ETT during all transfers.
- Suction ETT and oropharynx in all Pts. Caution with neurologically injured patient due to possible increase in intracranial pressure.
- Insert orogastric tube and aspirate.
- Ventilate using 100% oxygen and tidal volume of 7 ml/kg. Aim to maintain SpO<sub>2</sub> > 95% and EtCO<sub>2</sub> @ 35 - 40mmHg (except asthma where a higher EtCO<sub>2</sub> may be permitted, tricyclic OD where the target is 25 - 30mmHg, and DKA where the EtCO<sub>2</sub> should be maintained at the level detected immediately post-intubation, with a min. of 25mmHg).
- Document all checks and observations made to confirm correct ETT placement.

# Endotracheal Intubation Insertion (Paediatric)

## CPG P0301

### Status

- Insertion / General care of ETT

### ? Insertion and checks of ETT

#### ✓ Action

- Capnography - EtCO<sub>2</sub>
- Length lips / teeth
- Auscultate chest / epigastrium
  - Chest rise and fall, bag movement, SpO<sub>2</sub>, colour, tube misting
- Specific insertion instructions as per Insertion of Endotracheal Tube



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

### ? General care / ventilation

#### ✓ Action

- Disconnect and hold ETT during transfers
- ETT checks with each Pt movement
- Provide circulatory support if hypotension present
- Ensure wave capnography is being captured at all times
- Suction ETT and oropharynx when necessary
- Insert OG tube
- Ventilate V<sub>T</sub> 7ml / per kg, EtCO<sub>2</sub> 35 - 40mmHg appropriate to Pt condition
- Specific instructions as per General Care of the Intubated Pt

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

## Special Notes

- For patients who become hypotensive after intubation consider additional fluids and/or **Adrenaline** infusion according to clinical context. If hypotension persists consider reducing the sedation dose while closely monitoring the patient for signs of under-sedation.
- When utilising bolus doses start at the lower amount and escalate dosing according to clinical response
- Bolus dosing is intended to be only utilised when sedation is required while preparing for an infusion, while escalating infusion dosing or if an infusions is unavailable.
- Bolus doses are written as as the same preperation and concentration as the infusion preperation.

## General Care of the Intubated Pt

### • Post intubation Infusions

#### - Morphine 10mg + Midazolam 10mg in 10ml normal saline

= 1mg Morphine / 1mg Midazolam in 1 ml

= 1ml/hr = 1mg/hr

#### - Fentanyl 100mcg + Midazolam 10mg in 10ml normal saline

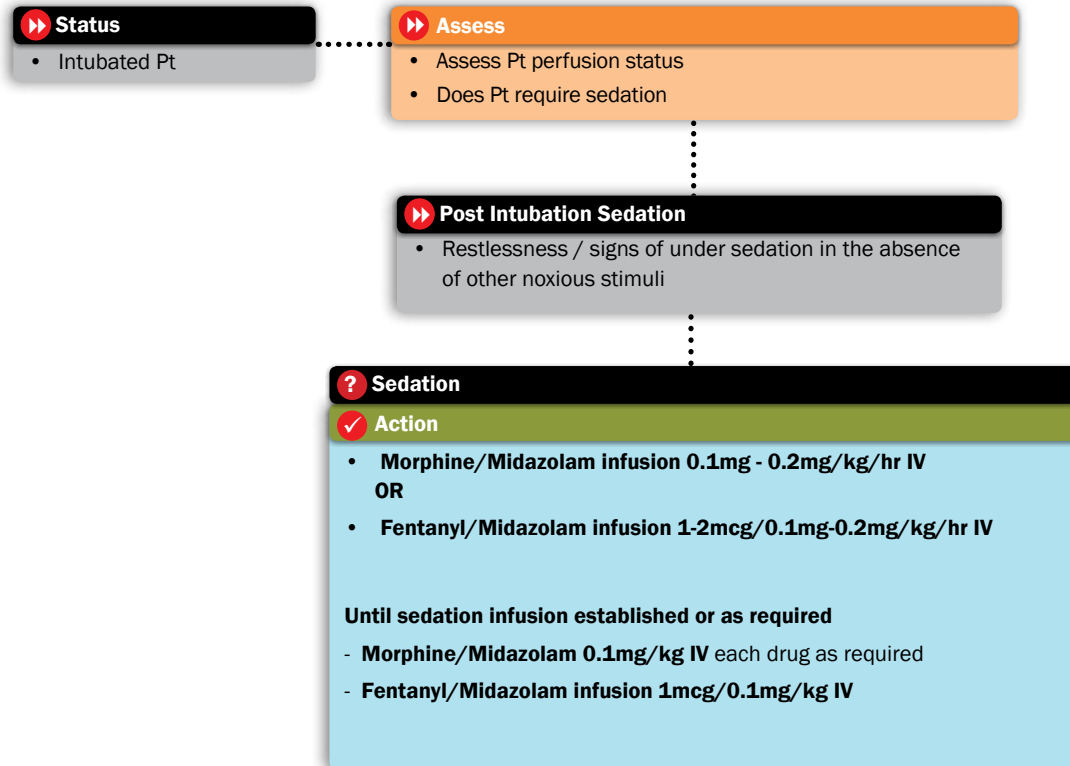
= 10mcg Fentanyl / 1mg Midazolam in 1 ml

= 1ml/hr = 10mcg/1mg/hr

### • Handover

The ETCO<sub>2</sub> and respiratory wave-form immediately prior to patient handover must be demonstrated to the receiving physician and documented on the ePCR

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



# Failed Intubation Drill (Paediatric)

**CPG P0302**

## Special Notes

- Insert appropriate sized Supraglottic airway where required.

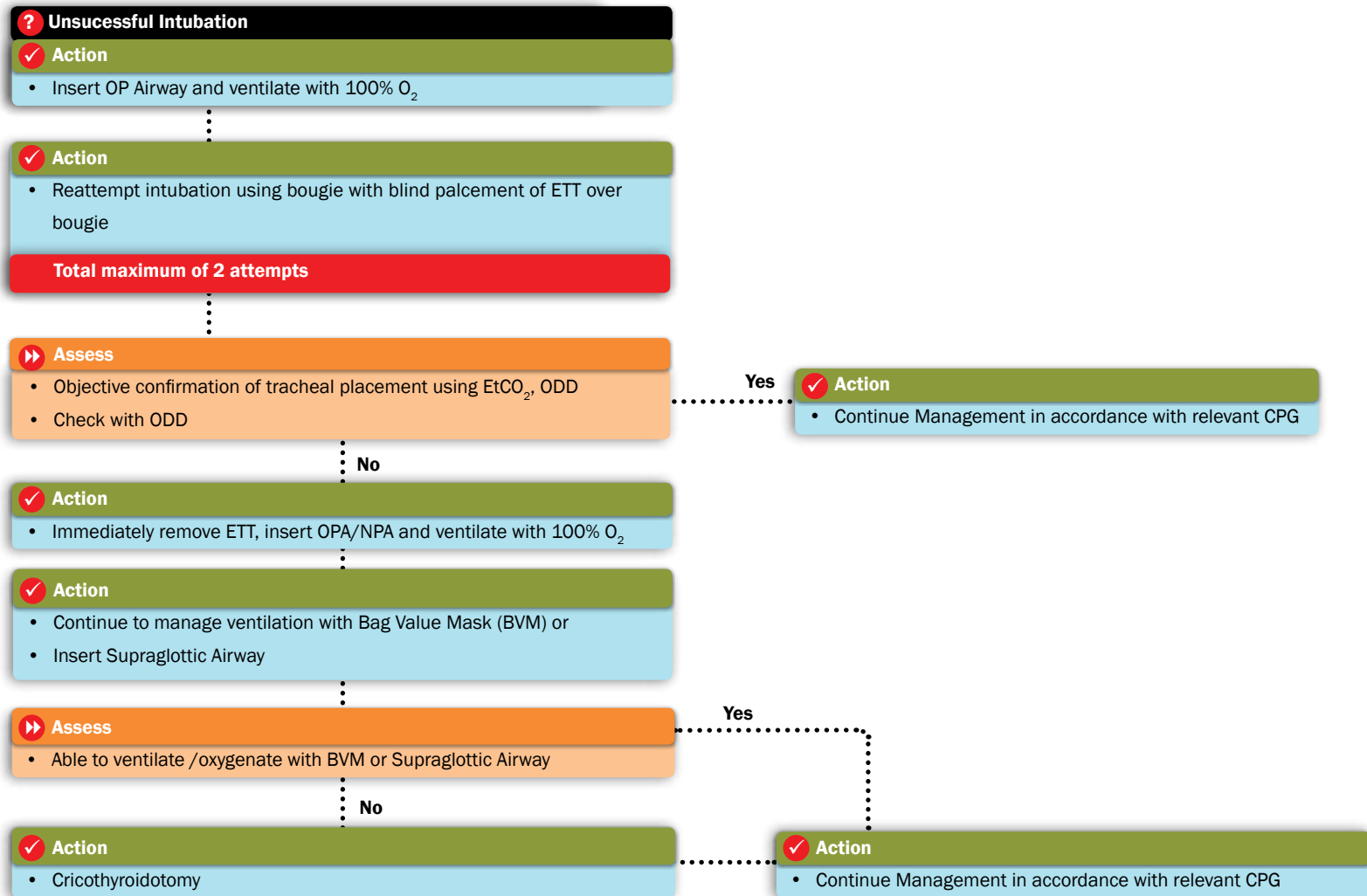
Size	Wt.
1	2 - 5kg
1.5	5 - 12kg
2	10 - 25kg
2.5	25 - 35kg
3	30 - 60kg

- If cricothyroidotomy is required for children under the age of 12 years then needle cricothyroidotomy should be performed and jet ventilation administered.



# Failed Intubation Drill (Paediatric)

## CPG P0302











# Bradycardia

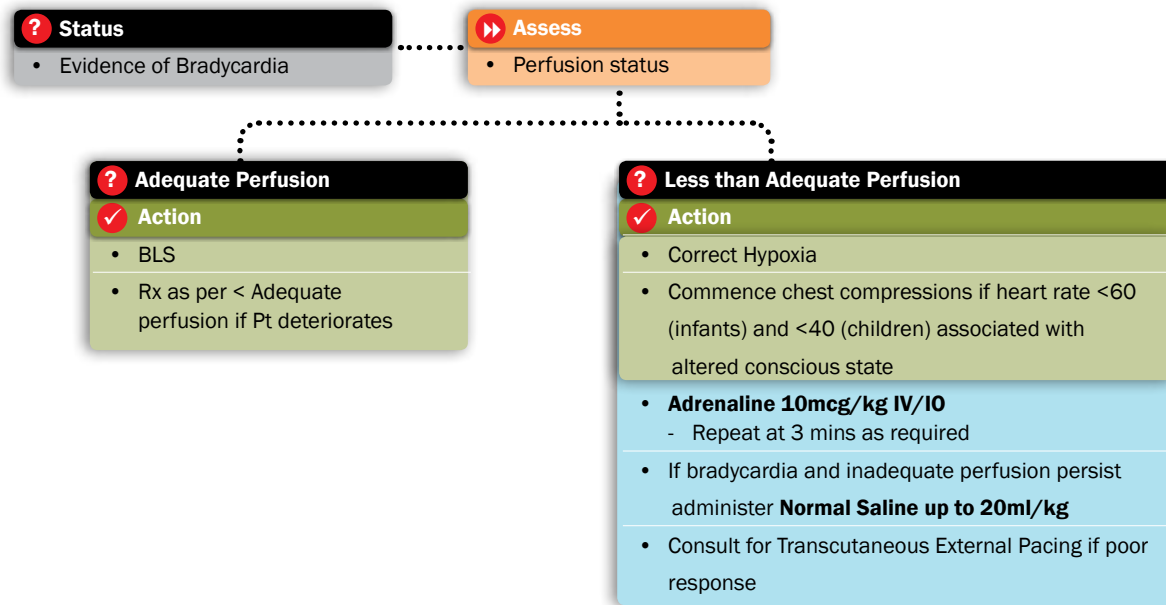
## CPG P0401

### Special Notes

- It is common for bradycardia to be the result of hypoxia and/or hypovolaemia in paediatrics. Hypoxia and/or hypovolaemia should be corrected if possible prior to drug therapy.

# Bradycardia

## CPG P0401







# Tachyarrhythmias

# CPG P0402

## Special Notes

- **Symptomatic signs and symptoms**
  - Rate related severe or persistent chest pain
  - Shortness of breath with crackles
  - Altered conscious state
- **Adenosine** requires rapid NaCL flush IV
- Ensure to press "sync" button on the defibrillator before performing Synchronised Cardioversion

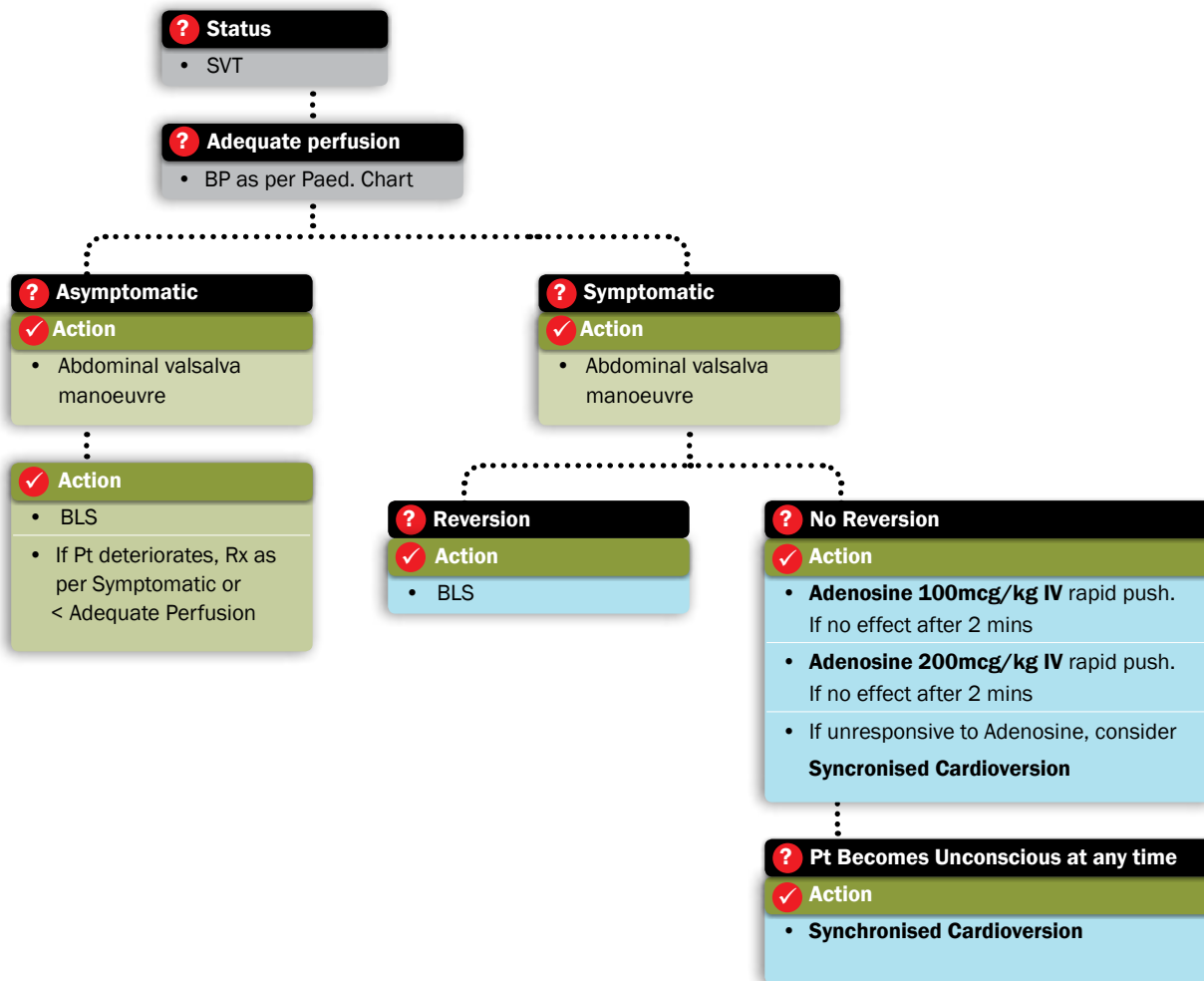
## General Care

### Comparison

Sinus Tachycardia (ST)	SVT
Hx compatible with ST eg. fever, injury, dehydration, pain	Hx does not support ST or non-specific
P waves present / normal	P waves absent / abnormal
Heart rate often varies with activity	Heart rate does not vary with activity
Variable R-R with constant PR	Abrupt rate changes
Infants: heart rate usually less than 220 bpm	Infants: heart rate usually greater than 220 bpm
Children: heart rate usually less than 180 bpm	Children: heart rate usually greater than 180 bpm
Sedation should be considered but should not delay cardioversion. The patient's conscious level and haemodynamic stability will guide the need for sedation	

# Tachyarrhythmias

## CPG P0402



# Tachyarrhythmias

## CPG P0402

### ? Status

- If inadequate perfusion with altered conscious state and deteriorating rapidly and / or unresponsive to **Adenosine**

### ? Unstable / rapidly deteriorating

#### ✓ Action

- If sedation required **Midazolam 50mcg/kg IV** over 1min. Repeat **50mcg/kg** @ 2 min intervals until pt does not respond to verbal stimuli but does respond to pain (**max. 200mcg/kg**)
- Synchronised Cardioversion (*Ensure to 'activate the synchroniser' and it is functioning effectively while preparing airway & ventilation equipment.*)
  - Biphasic: 1J /kg
  - Medical Consult if unsuccessful
- If another rhythm develops at any stage treat as for appropriate **Clinical Practice Guideline**
- If Pt becomes pulseless, Rx as per **CPG P0201 Cardiac Arrest (Paediatric)**

### ? Reversion

#### ✓ Action

- BLS

### ? Loss of output

#### ✓ Action

- As per appropriate CPG







# Pain Management (Paediatric)

## CPG P0501

### Special Notes

- The max dose of **Methoxyflurane** is **6ml** per 24hr period.
- Opioids are NOT to be administered to patients with migraines.
- BP, HR, Resp Rate and SpO2 is to be recorded initially and repeated after administering a dose of pain relief.
- If respiratory depression occurs due to narcotic administration should be managed as per **CPG P0707 Management of Overdose** if required
- IM Morphine** effect on pain relief is slow and variable. This protocol must be used as a last resort and strictly within indicated Guidelines.
- IV Ketamine** is only to be given on medical consult, and its use is strictly as a last resort
- Consider smaller doses of IV pain relief if the patient has previously been administered opioids
- Once initial opioid loading has occurred (2-3 doses) the dose of Morphine or Fentanyl should be reduced and the time between doses doubled.

### General Care

- It is essential that the dose + volume is double checked prior to administration.
- In younger patients (1-2 years) adequate analgesia may be attained with a single dose of **Fentanyl IN**. Carefully monitor for side effects such as excessive sedation and respiratory depression.

IN Fentanyl Dosing Table		
	Small Child (10-24kg)	Large Child (>25kg)
Initial Dose	25 mcg	50 mcg
Volume	1 Spray	2 Sprays
Subsequent doses	25mcg	50 mcg
Volume	1 Spray	2 Sprays
This table is calculated off utilising 25mcg atomizer sprays		
Children under 10kg Consult with Clinical Coordinator regarding Pain Management		

### Paracetamol 15mg/kg dose (based on 120mg in 5mL liquid)

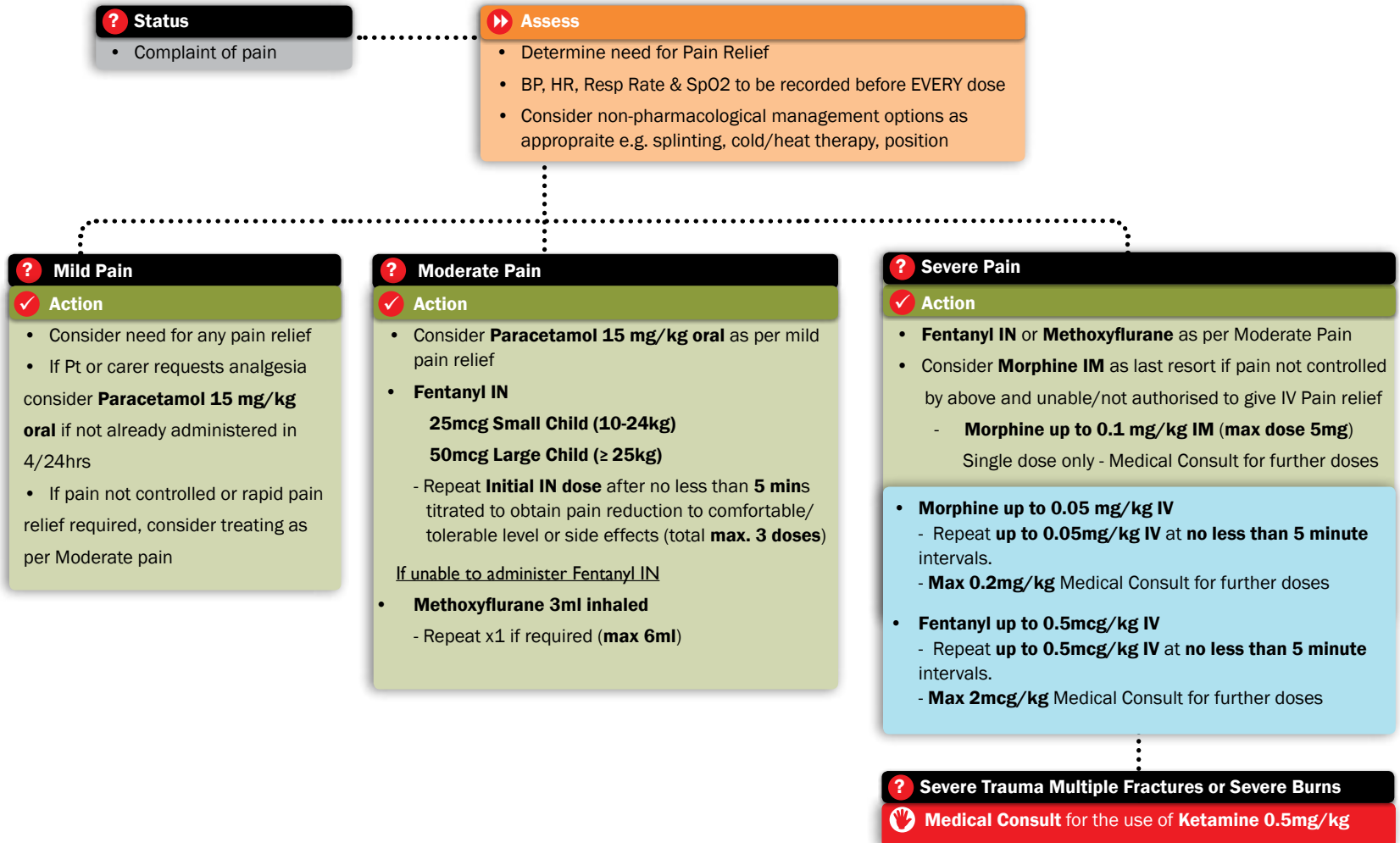
#### CONFIRM DOSE WITH LABEL ON BOTTLE

Age (Years)	Weight (Kg)	Dose (mg)	Volume (nearest ml)
3 months	6	90	4
6 months	8	120	5
1 year	10	150	6
2	12	180	8
3	14	210	9
4	16	240	10
5	18	270	11
6	20	300	13
7	22	330	14
8	24	360	15
9	26	390	16
10	33	495	21
>11	36	500	500mg tablet

NB. Children ages 10-14 yrs can have a single 500mg tablet as an alternative to the liquid preparation depending on patient preference.

# Pain Management (Paediatric)

## CPG P0501





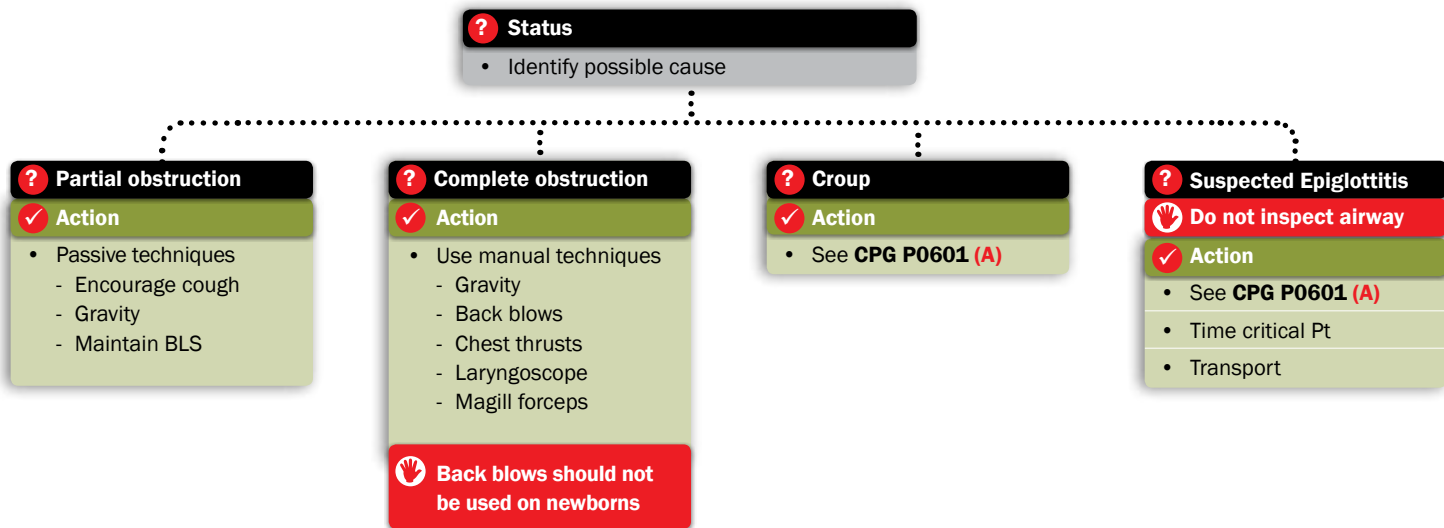






# Upper Airway Obstruction (Paediatric)

## CPG P0601



# Upper Airway Obstruction (Paediatric)

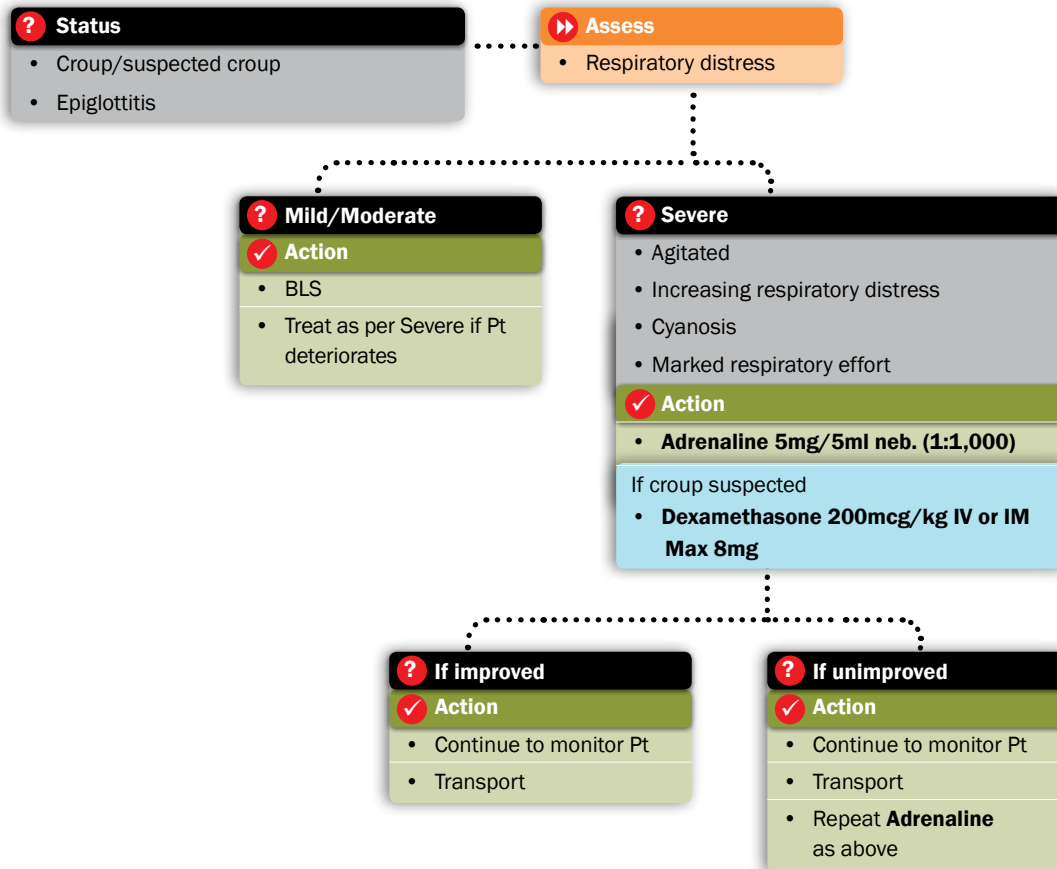
**CPG P0601**

## Special Notes

- Neb. **Adrenaline** for croup is indicated for children presenting with signs of hypoxia, e.g. agitated, distressed, cyanosis, SpO<sub>2</sub> of < 92 % on air, evidence of decreasing SpO<sub>2</sub> or with severe obstruction indicated by marked use of accessory muscles.

# Upper Airway Obstruction (Paediatric)

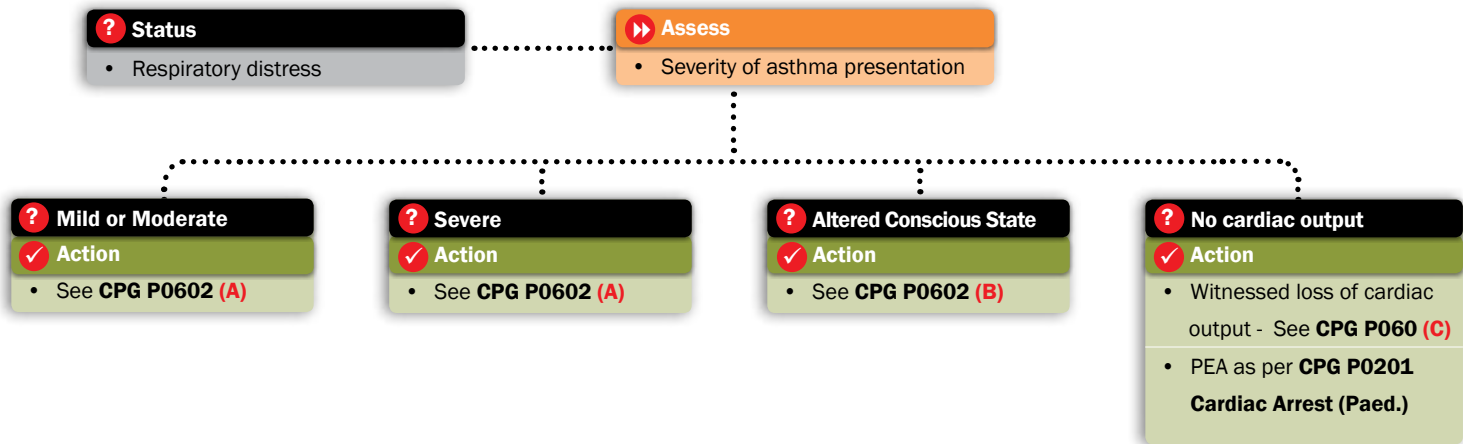
**CPG P0601** (A)





# Asthma (Paediatric)

## CPG P0602





# Asthma (Paediatric)

## CPG P0602

### Special Notes

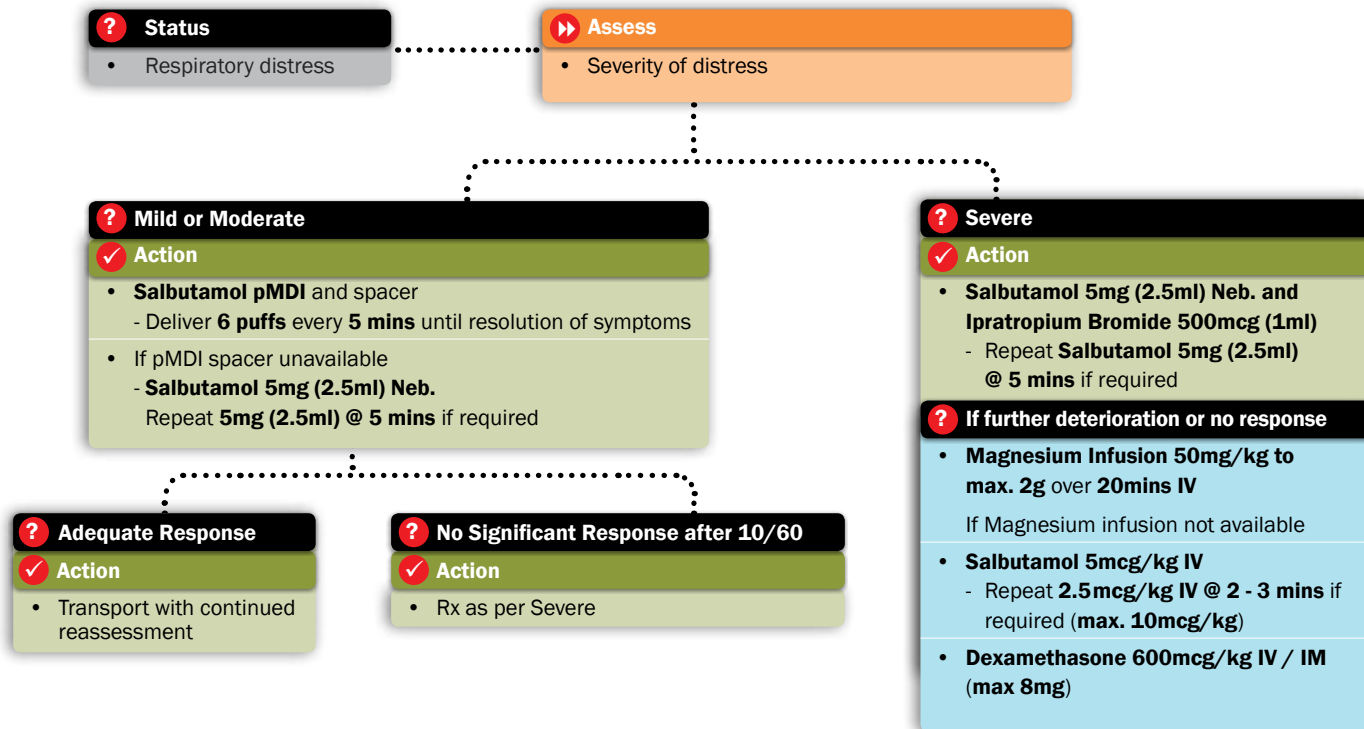
- Asthmatic Pts are dynamic and can show initial improvement with treatment then deteriorate rapidly.
- Consider ICP support but do not delay transport waiting for backup.
- Despite hypoxaemia being a late sign of deterioration, pulse oximetry should be used throughout Pt contact
- An improvement in SpO<sub>2</sub> may not be a sign of improvement in clinical condition.
- pMDI = Pressurised Metered Dose Inhaler

### General Care

- **Magnesium infusion**
  - **Magnesium 50mg/kg (max 2g)** diluted in **50ml D5W** given over 20 mins @ delivery rate 150ml/hr

# Asthma (Paediatric)

## CPG P0602 (A)



# Asthma (Paediatric)

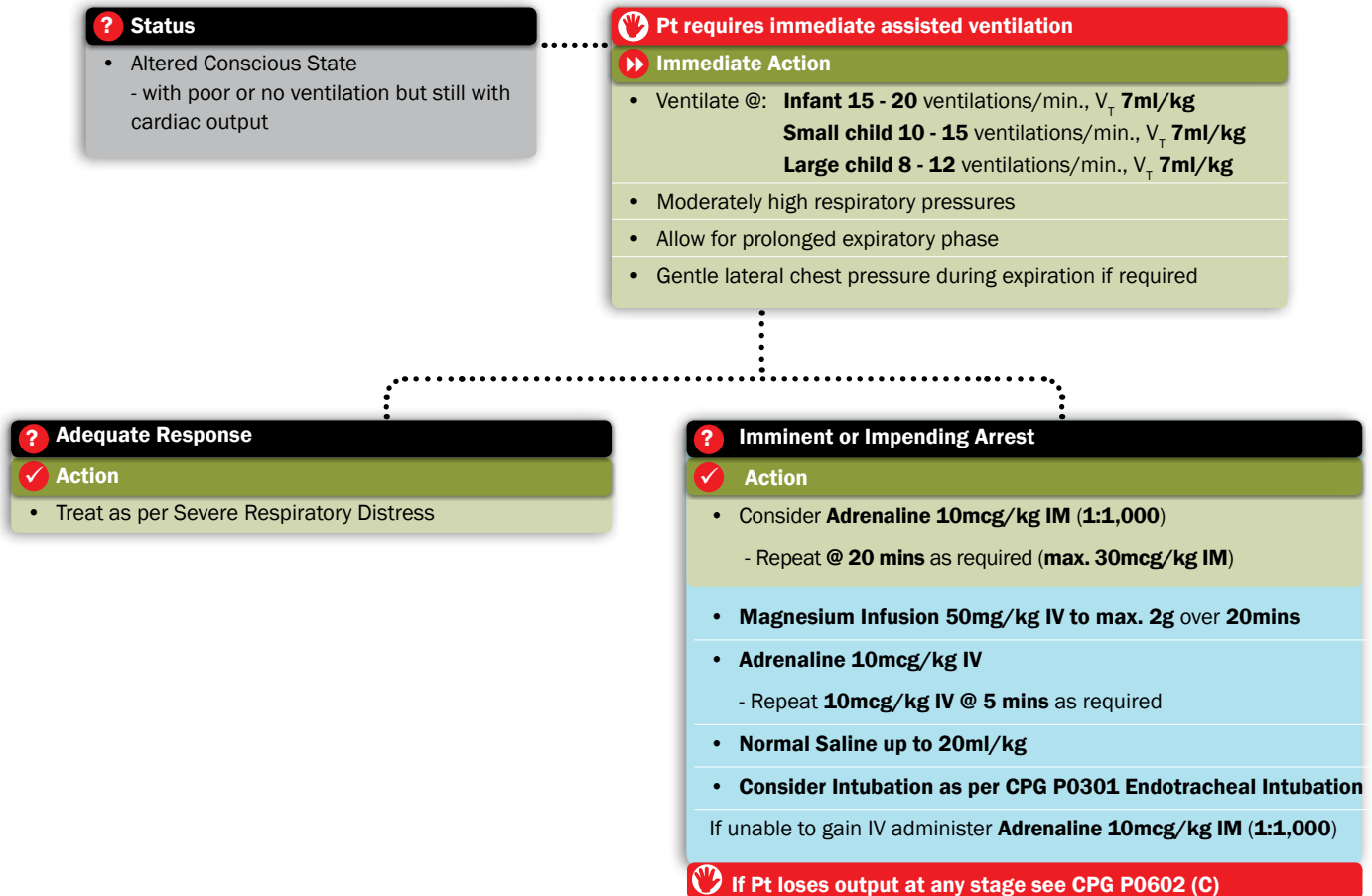
## CPG P0602

### Special Notes

- Extreme care is necessary when assisting ventilation in asthma. High positive pressures are necessary although severe bronchoconstriction, especially exhalation, causes gas trapping.
- High EtCO<sub>2</sub> levels should be anticipated in the asthmatic with altered conscious state. Pt. EtCO<sub>2</sub> levels of 120mmHg in this setting is considered safe and no attempt should be made to reduce this via increased ventilation except in the setting of severe persistent hypoxia.

# Asthma (Paediatric)

CPG P0602 (B)

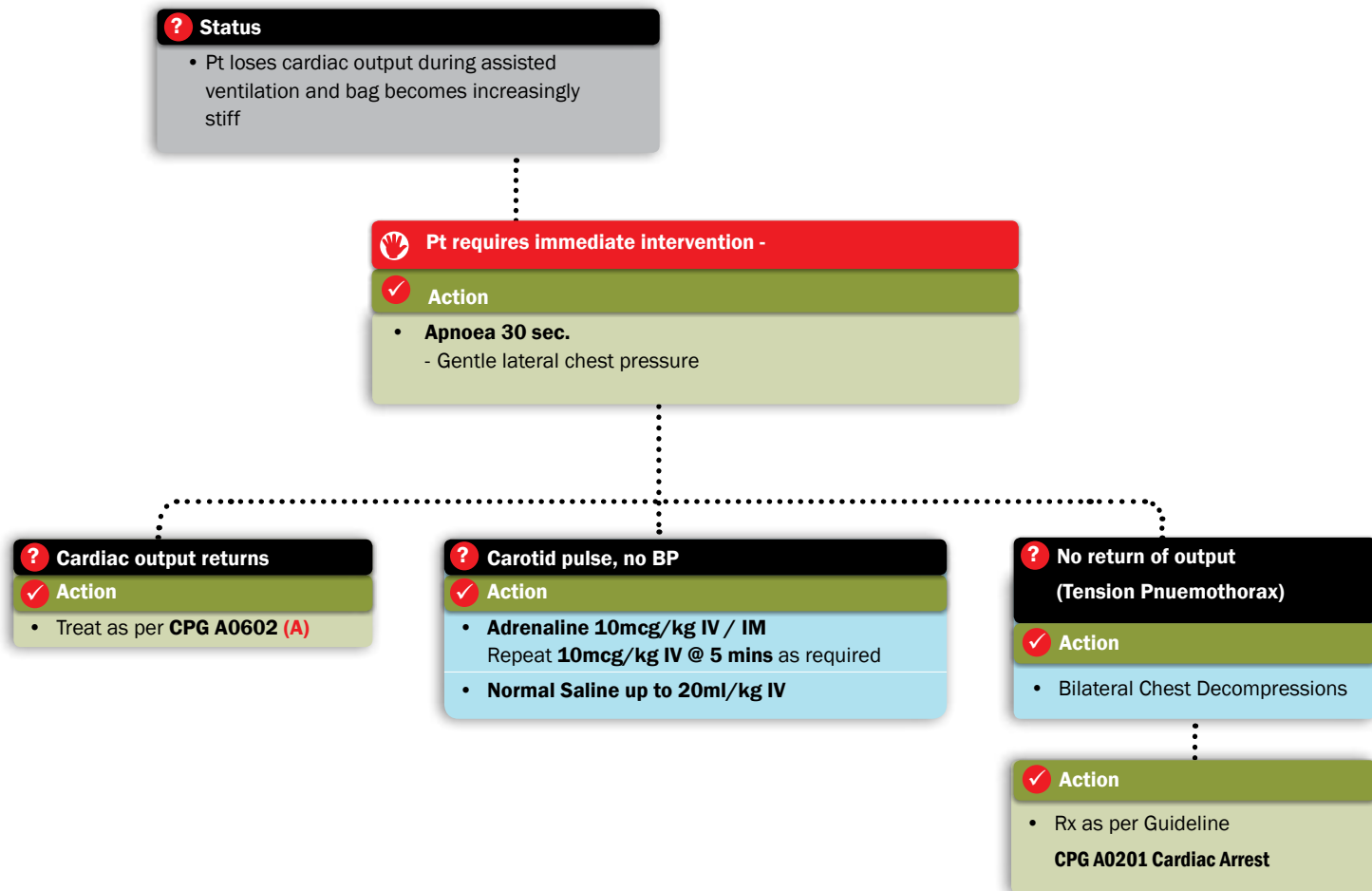


### Special Notes

- Positive Pressure Ventilation, via gas trapping, may generate progressively higher intrathoracic pressures. This reduces venous return and the patient may lose palpable cardiac output, resulting in Electro Mechanical Dissociation. Clinical differentiation between tension pneumothorax and high intrathoracic pressure at this point is clinically impossible to differentiate. One minute of apnoea may permit gas trapping to decrease slowly via elastic recoil, aided by gentle lateral chest thrusts with return of pulses. If after one minute of apnoea, ventilation remains difficult and no output is detectable, tension pneumothorax must be presumed present. Due to the difficulty in identifying the affected side, it is advised that bilateral chest decompression is performed.

# Asthma (Paediatric)

CPG P0602 (c)













# Nausea and Vomiting

**CPG P0701**

## Special Notes

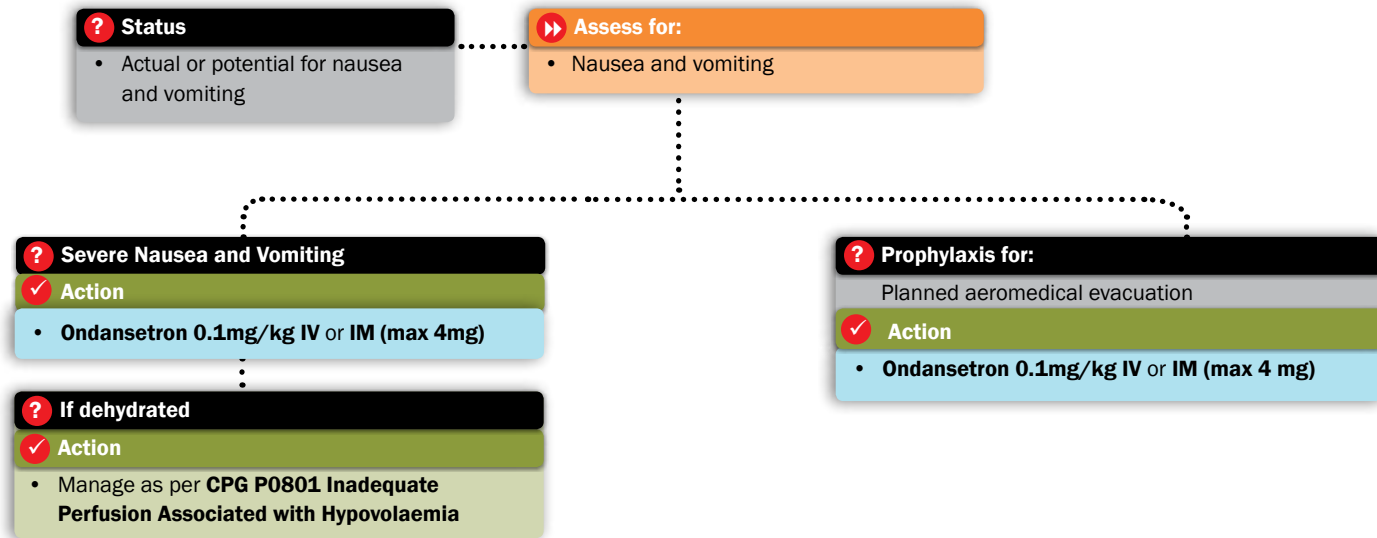
- **Ondansetron is indicated for patients > 2 years old.**
- Antiemetics should never be administered if the Pt is suspected of taking an oral drug overdose. This may increase the absorption of the ingested substance.

## General Care

- If nausea and vomiting are tolerated, basic care and transport are the only treatment required.

# Nausea and Vomiting

## CPG P0701





# Glycaemic Emergencies (Paediatric)

**CPG P0702**

## Special Notes

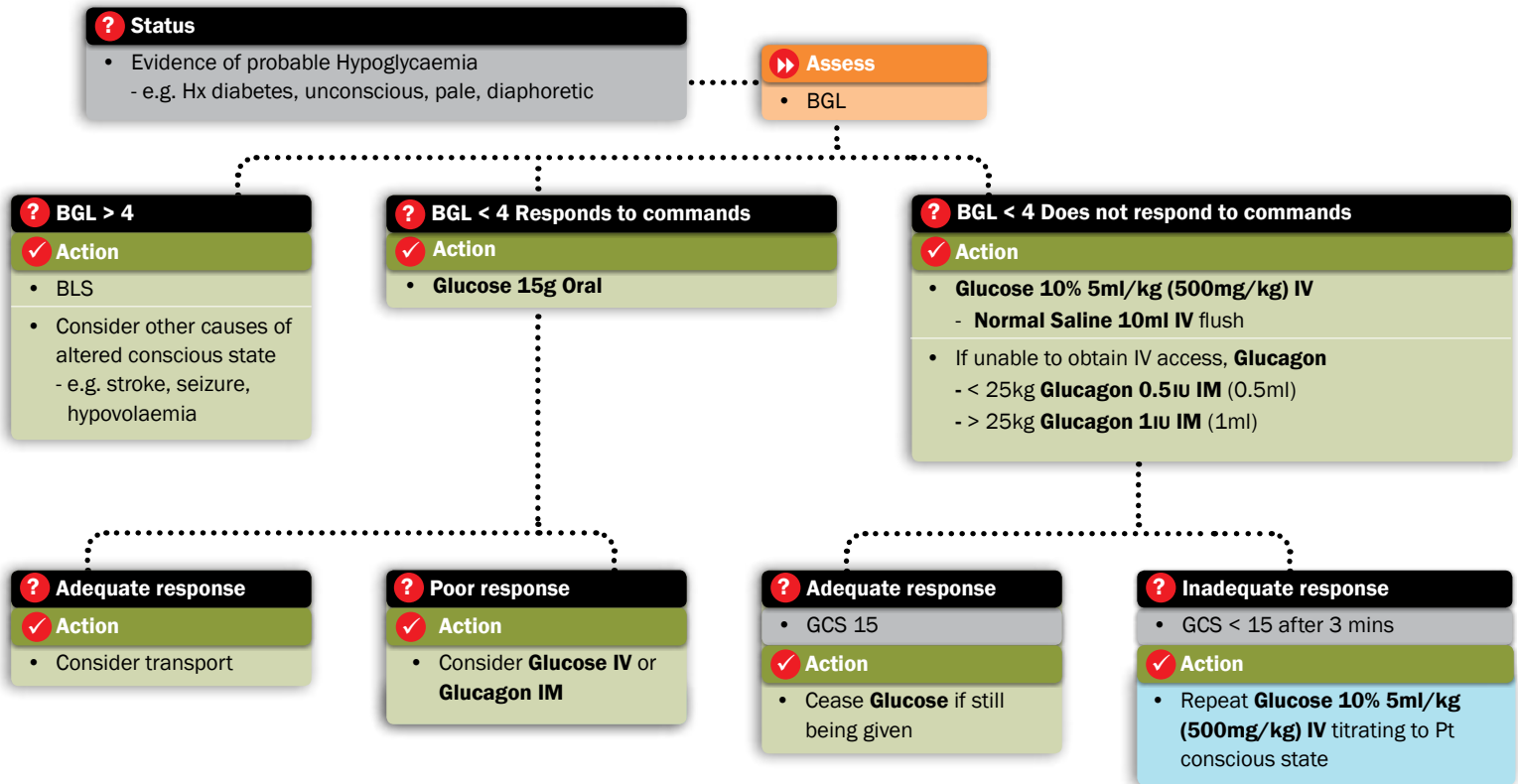
- Pt may be aggressive during management.
- Ensure IV patent before administering **Glucose**. Extravasation of **Glucose** can cause tissue necrosis.
- Ensure sufficient advice on further management and follow-up if Pt refuses transport.

## General Care

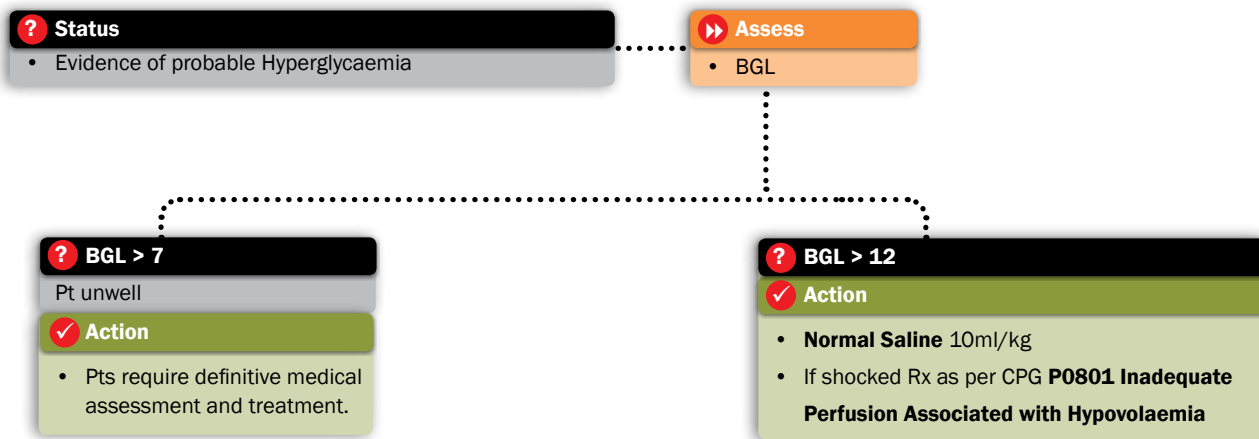
- If Pt's next meal is more than 20mins away, encourage the Pt to eat a low GI carbohydrate (e.g. sandwich, piece of fruit, glass of milk) to sustain BGL to next meal.
- If adequate response, maintain initial Mx and transport.
- If the Pt refuses transport, use a relative or friend to reinforce the advice for transport using friend or relative. If Pt still refuses transport, document the refusal, and leave the Pt with a responsible third person. Advise the third person of actions to take if symptoms re-occur and of the need to make early contact with Primary Care Physician for follow up.
- If inadequate response transport without delay.
- Maintain general care of the unconscious Pt and ensure adequate airway and ventilation.
- A further dose of **Glucose 10%** may be required in some Hypoglycaemic episodes. Consider consultation if BGL remains less than 4mmol/L and it is not possible to administer oral carbohydrates.
- Continue initial Mx and transport.

# Glycaemic Emergencies (Paediatric)

## CPG P0702



# Glycaemic Emergencies (Paediatric)

**CPG P0702**



# Continuous or Recurrent Seizures (Paediatric)

## CPG P0703

### Special Notes

- Seizures may not always present with tonic/clonic limb activity. e.g. unconsciousness with flicking eye movements (nystagmus) may indicate ongoing seizure activity.
- If the Pt has a past history of seizures, and refuses transport, leave them in the care of a responsible third person. Advise the person of the actions to take for immediate continuing care if symptoms reoccur, and the importance of early contact with their primary care physician for follow-up.

### Special Notes

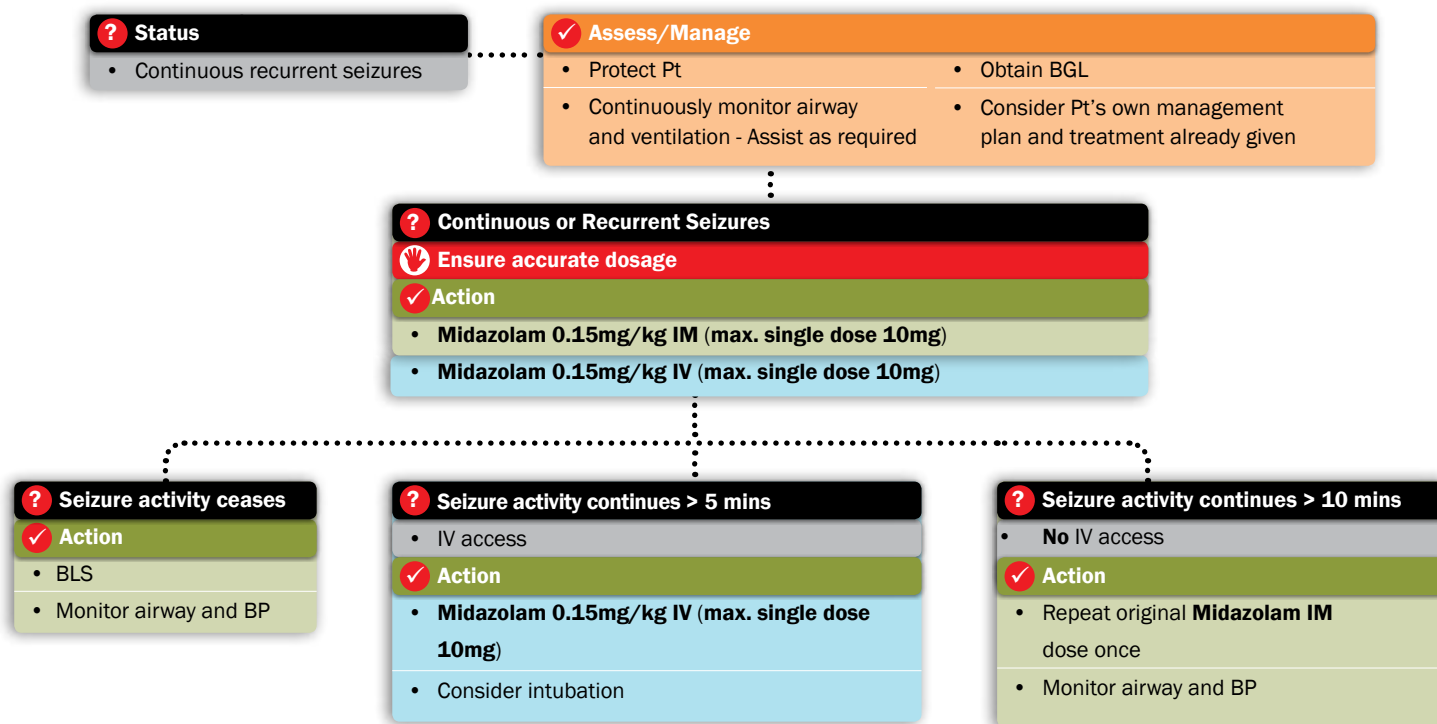
- Ensure accurate dose calculation and confirm this with other Paramedics on scene.
- Midazolam** can have pronounced effects on BP, conscious state and airway tone.
- Calculate the dose each time as stock strength may change and familiarity may lead to errors.
- If a single seizure has spontaneously terminated continue with initial management and transport.

### Midazolam Dosage Chart

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg
Midazolam (IM) 5mg/1ml (1mg=0.2ml)	0.1	0.15	0.2	0.3	0.36	0.42	0.48	0.54	0.6	0.66	0.72	0.78	1.0	1.1	1.2	ml
	0.5	0.75	1.0	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	5.0	5.4	6	mg
	1ml syringe													5mg/1ml x 2		
Midazolam (IV) 5mg/5ml (1mg=1ml) 5mg/1ml	0.5	0.75	1.0	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	5.0	1.1	1.2	ml
	0.5	0.75	1.0	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	5.0	5.4	6	mg
	Dilute 5mg/1ml with 4ml normal saline in 5 ml syringe													5mg/1ml x 2		
														3ml syringe		

# Continuous or Recurrent Seizures (Paediatric)

## CPG P0703



# Anaphylaxis (Paediatric)

# CPG P0704

## Special Notes

- Signs of allergy include a range of cutaneous manifestations and/or a history of allergen exposure. This history can include food, bites/stings, medications or the allergen can be unknown
- In rare circumstances anaphylaxis can occur with symptoms in an isolated body system. If a patient has hypotension, bronchospasm or upper airway obstruction where anaphylaxis is considered possible following exposure to a **known allergen** for the patient, treat as anaphylaxis.
- International guidelines recommend IM administration of **Adrenaline** to the anterolateral mid-thigh as the preferred site due to improved absorption. While remaining alert to patient comfort and dignity issues, the mid-lateral thigh should be considered the preferred site of administration where possible.
- **IV Adrenaline** bolus doses are no longer considered acceptable practice where an IV infusion can be utilised
- **IM Adrenaline** should be first route of administration even in the severely compromised patient
- **Any infusion established under this Guideline must be clearly labelled with the drug name and dose of any additive drug and their dilution.**
- For patients persistently unresponsive to **Adrenaline** (especially if taking beta blocker medication) the administration of **Glucagon 1-2IU IM or IV** can be considered under medical consult. **Glucagon** administration must not delay further **Adrenaline** administration.
- Anaphylaxis with hypotension or cardiac arrest will require aggressive fluid resuscitation, and is an essential adjunct to adrenaline. Doses of up to 50ml/kg may sometimes be required.

## General Care

- Anaphylaxis can be difficult to identify. Cutaneous features are common though not mandatory. Irrespective of known allergen exposure, if 2 or more systemic manifestations are observed then anaphylaxis should be accepted.
- Deaths from anaphylaxis are far more likely to be associated with delay in management rather than due to inadvertent administration of **Adrenaline**.
- All patients with suspected anaphylaxis must be advised that they should be transported to hospital regardless of their presentation or response to management. International guidelines recommend at least 4 hours observation following treatment.
- Inhaled therapy may be of benefit in management of anaphylaxis though it should always be secondary therapy. Salbutamol may be of use for persistent bronchospasm and Nebulised Adrenaline may be of use for persistent upper airway oedema and stridor.
- Where poor perfusion persists despite initial Adrenaline therapy, large volumes of fluid may be extravassating. IV fluid therapy is indicated to support vasopressor administration



## Paediatric Adrenaline Infusion

Preparation of **Adrenaline infusion** (Paediatric):

- **300mcg Adrenaline** added to **49.7ml D5W** = **6mcg/ml**
- 1ml = 6mcg                      1ml/hr = 0.1mcg/min

At low flow rates in younger children, an infusion may not be as effective as providing boluses. Clinical Judgement should be applied regarding the most effective route of administration.

# Anaphylaxis (Paediatric)

# CPG P0704

## ? Status

- Suspected anaphylaxis

## Stop

- If patient has history of anaphylaxis and has received management prior to arrival, they **MUST** be transported to hospital for observation and follow up

⋮

## Assess

- Sudden onset of Symptoms (minutes to hours), **AND**
- Two or more symptoms of **R.A.S.H.** with or without confirmed antigen exposure
  - **R** Respiratory distress (SOB, wheeze, cough, stridor)
  - **A** Abdominal symptoms (nausea, vomiting, diarrhea, abdominal pain/cramping)
  - **S** Skin/mucosal symptoms (hives, welts, itch, flushing, angioedema, swollen lips/tongue)
  - **H** Hypotension (or altered conscious state)

## OR

- Isolated hypotension, or isolated bronchospasm, or Isolated upper airway obstruction, following likely exposure to a known antigen

## OR

- Any single symptoms of **R.A.S.H.** in a patient exposed to a known antigen and previous history of Anaphylaxis/Severe allergic reactions to the same antigen

## ? No Anaphylaxis

### ✓ Action

- Basic life support
- Reassess for potential deterioration
- Consider transport for observation and further management

## ? Anaphylaxis / Severe Allergic reaction

### ✓ Action

- Monitor Pt for cardiac arrhythmias
- Adrenaline 10mcg/kg IM (1 : 1,000)**  
(max dose 500mcg)  
- Repeat 10mcg/kg IM @ 5 mins until satisfactory results or side effects occur
- Treat bronchospasm as per **P0601 Asthma**
- Consider fluid as per **CPG P0801 Inadequate Perfusion Associated with Hypovolaemia**
- Consider **Nebulised Adrenaline** for upper airway oedema as per **P0601 Upper Airway Obstruction**

## ? Inadequate Response or Deteriorating

### ✓ Action

- If no IV access consider I/O
- Adrenaline infusion** commencing @ **0.1mcg/kg/min** ( $0.1\text{mcg/kg/min} = 1\text{ml/kg/hr}$ ) titrated to response or adverse effects (**Max starting rate 10mcg/min**)

# Meningococcal Septicaemia (Paediatric)

## CPG P0706

### Special Notes

- Meningococcal septicaemia is a life-threatening infection, caused by the meningococcus bacteria *Neisseria meningitidis*. Deterioration can be rapid and irreversible, with treatment becoming less effective as the disease state progresses. A Non-blanching rash, either; petechial (pin-point) or purpuric (bruises) can be a late sign. If Meningococcal septicaemia is suspected then administer Ceftriaxone.
- A typical purpuric rash may be subtle in some cases and present as a single 'spot' only.
- The presence of rapid onset symptoms of sepsis +/- rash may be a sign of Meningococcal Septicaemia.
- Meningococcal is transmitted by close personal exposure to airway secretions/droplets.
- Ensure face mask protection especially during intubation/suctioning.
- Ensure follow up for staff post occupational exposure.

### General Care

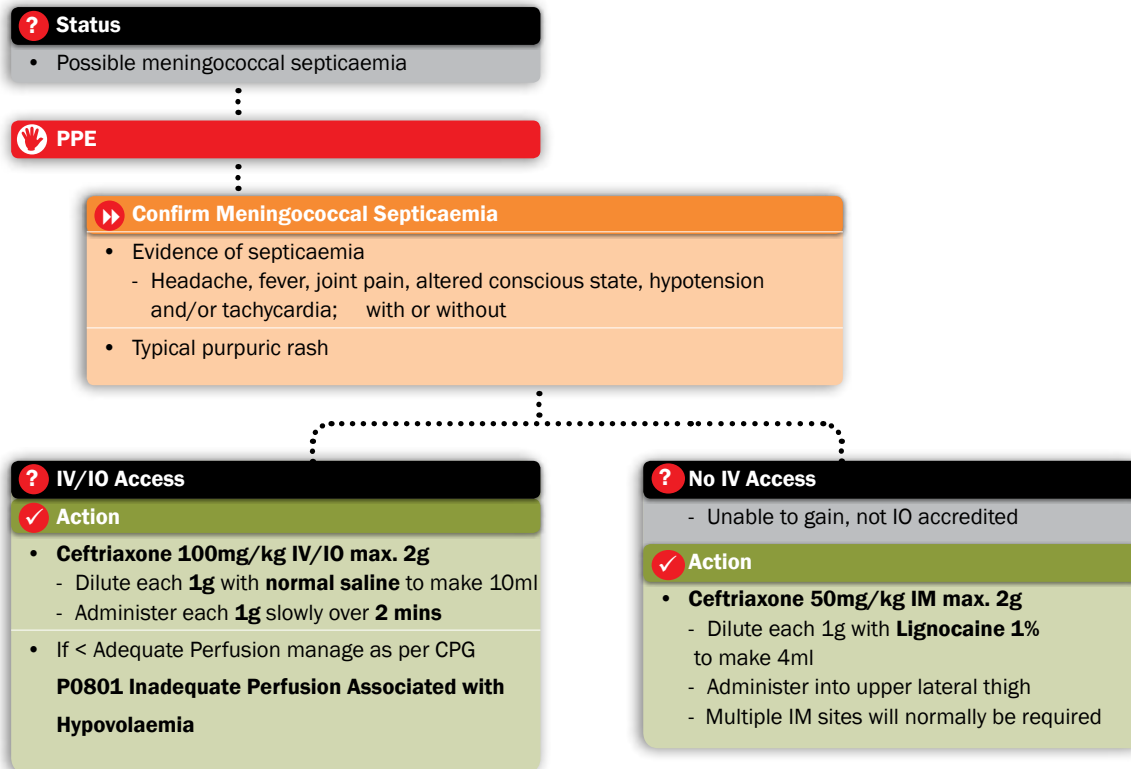
- **Ceftriaxone preparation**
  - Dilute each **1g of Ceftriaxone** with **9.5ml** of **normal saline** and administer **100mg/kg IV/IO** over approximately 2-4mins.
  - If unable to obtain IV/IO access, dilute each **1g of Ceftriaxone** with **3.5ml** **1% Lignocaine HCL** and administer **50mg/kg IM** into the upper lateral thigh.
  - Multiple IM sites may be necessary to deliver dose

### Paediatric Chart

Age	0	2 Mth	6 Mth	1	2	3	4	5	6	7	8	9	10	11	12	Yrs
Weight	3.5	5	7	10	12	14	16	18	20	22	24	26	33	36	40	kg
<b>Ceftriaxone (IM) 50mg/kg</b> 1g diluted with 3.5ml 1% Lignocaine (1ml = 250mg)	0.7	1.0	1.4	2	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	6.6	7.2	8	ml
	175	250	350	500	600	700	800	900	1000	1100	1200	1300	1650	1800	2000	mg
	1ml syringe		2.5ml syringe			10ml syringe										
<b>Ceftriaxone (IV) 100mg/kg</b> 1g diluted with 9.5ml normal saline (1ml = 100mg)	3.5	5.0	7.0	10.0	12.0	14.0	16.0	18.0	20	20	20	20	20	20	20	ml
	350	500	700	1000	1200	1400	1600	1800	2000	2000	2000	2000	2000	2000	2000	mg
	10ml syringe															

# Meningococcal Septicaemia (Paediatric)

## CPG P0706



# Management of Overdose (Paediatric)

**CPG P0707**

## General Care

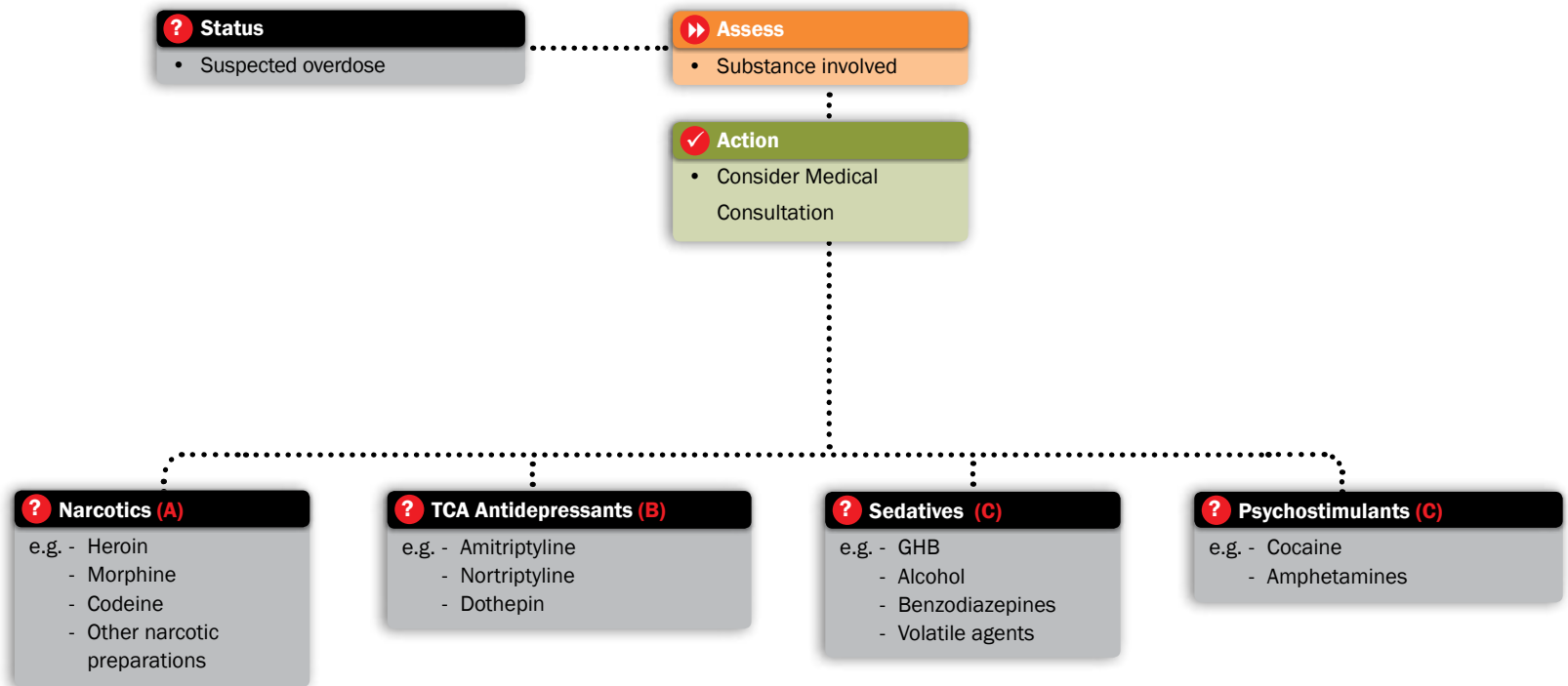
- Provide Supportive Care (all cases)
  - Provide appropriate airway management and ventilatory support.
  - If Pt is in an altered conscious state, assess random blood glucose and if necessary manage as per **CPG P0702 Glycaemic Emergencies (Paediatric)**.
  - If Pt is bradycardic with poor perfusion manage as per **CPG P0201 Bradycardia (Paediatric)**.
  - If Pt is inadequately perfused, manage as per **CPG P0801 Inadequate Perfusion Associated with Hypovolaemia (Paediatric)**.
  - Assess Pt temperature and manage as per **CPG P0901 Hypothermia / Cold Injury (Paediatric)**, or **CPG P0902 Environmental Hyperthermia / Heat Stress (Paediatric)**.

## General Care

- Confirm Clinical Evidence of Substance Use or Exposure
  - Identify which substance/s are involved and collect if possible.
  - Identify by which route the substance/s had been taken (e.g. ingestion).
  - Establish the time the substance/s were taken.
  - Establish the amount of substance/s taken.
  - What were the substance/s mixed with when taken (e.g.: alcohol, water)?
  - What treatment has been initiated prior to ambulance arrival (e.g. induced vomiting)?

# Management of Overdose (Paediatric)

## CPG P0707





# Management of Overdose: Narcotics (Paediatric)

**CPG P0707**

## Special Notes

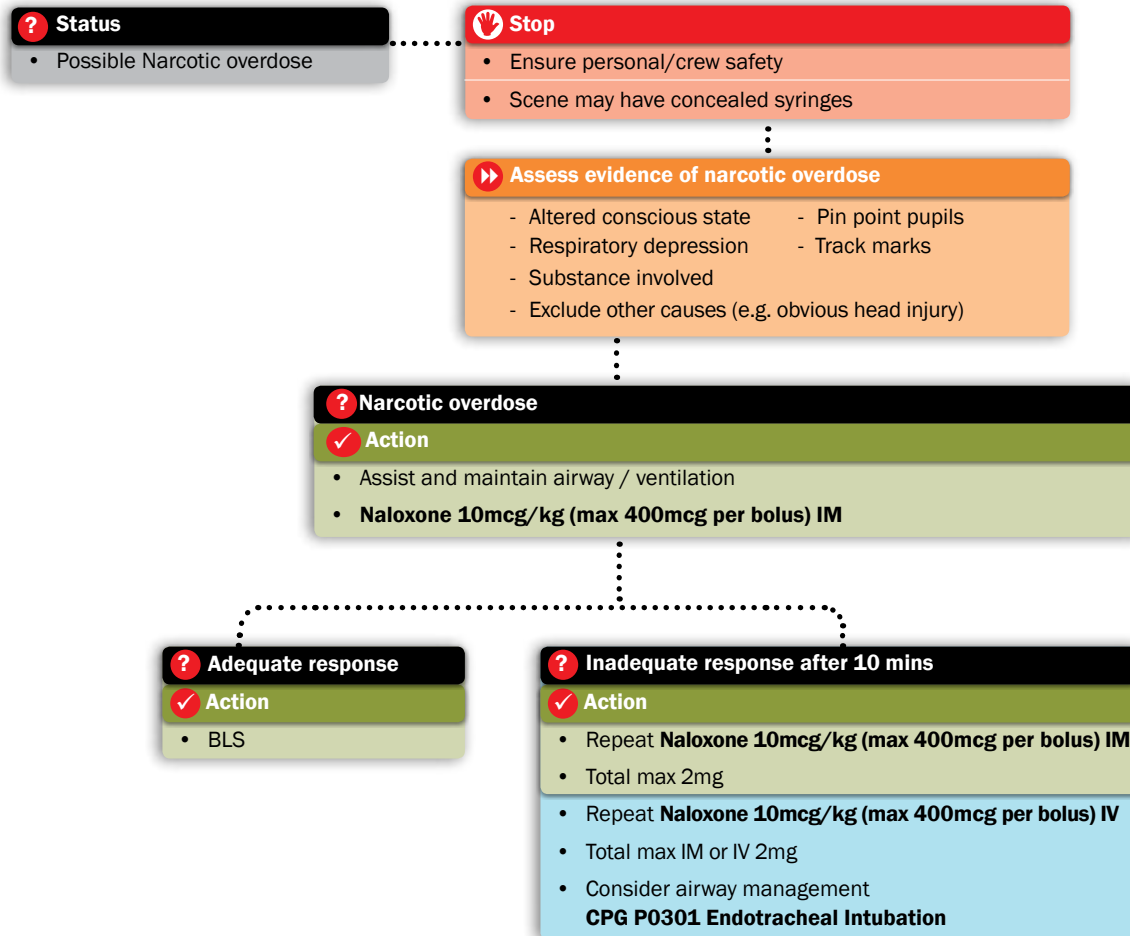
- Newborns effected by maternal narcotic administration may be delivered with respiratory depression that may require this Guideline to Mx.

## General Care

- If inadequate response after 10 mins Pt is likely to require transport without delay
  - Maintain general care of the unconscious Pt and ensure adequate airway and ventilation.
  - Consider other causes e.g. head injury, hypoglycaemia polypharmacy overdose.
  - Beware of Pt becoming aggressive.

# Management of Overdose: Narcotics (Paediatric)

**CPG P0707** (A)



# Management of Overdose:

## Tricyclic Antidepressants (TCA) (Paediatric)

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**CPG P0707**

### Special Notes

#### Signs and Symptoms of TCA Toxicity

- Mild to moderate OD
  - Drowsiness, confusion
  - Tachycardia
  - Slurred speech
  - Hyperreflexia
  - Ataxia
  - Mild hypertension
  - Dry mucus membranes
  - Respiratory depression
- Severe toxicity
  - Coma
  - Respiratory depression / hypoventilation
  - Conduction delays
  - Premature Ventricular Contractions (PVCs)
  - SVT
  - VT
  - Hypotension
  - Seizures
  - ECG changes

This could lead to aspiration, hyperthermia, rhabdomyolysis and acute pulmonary oedema.

### Special Notes

#### ECG changes

ECG changes include positive R wave > 3mm in aVR, prolonged PR, QRS and QT intervals. If QRS widening and >0.12 sec - indicates severe toxicity with risk of ventricular arrhythmias and seizures.

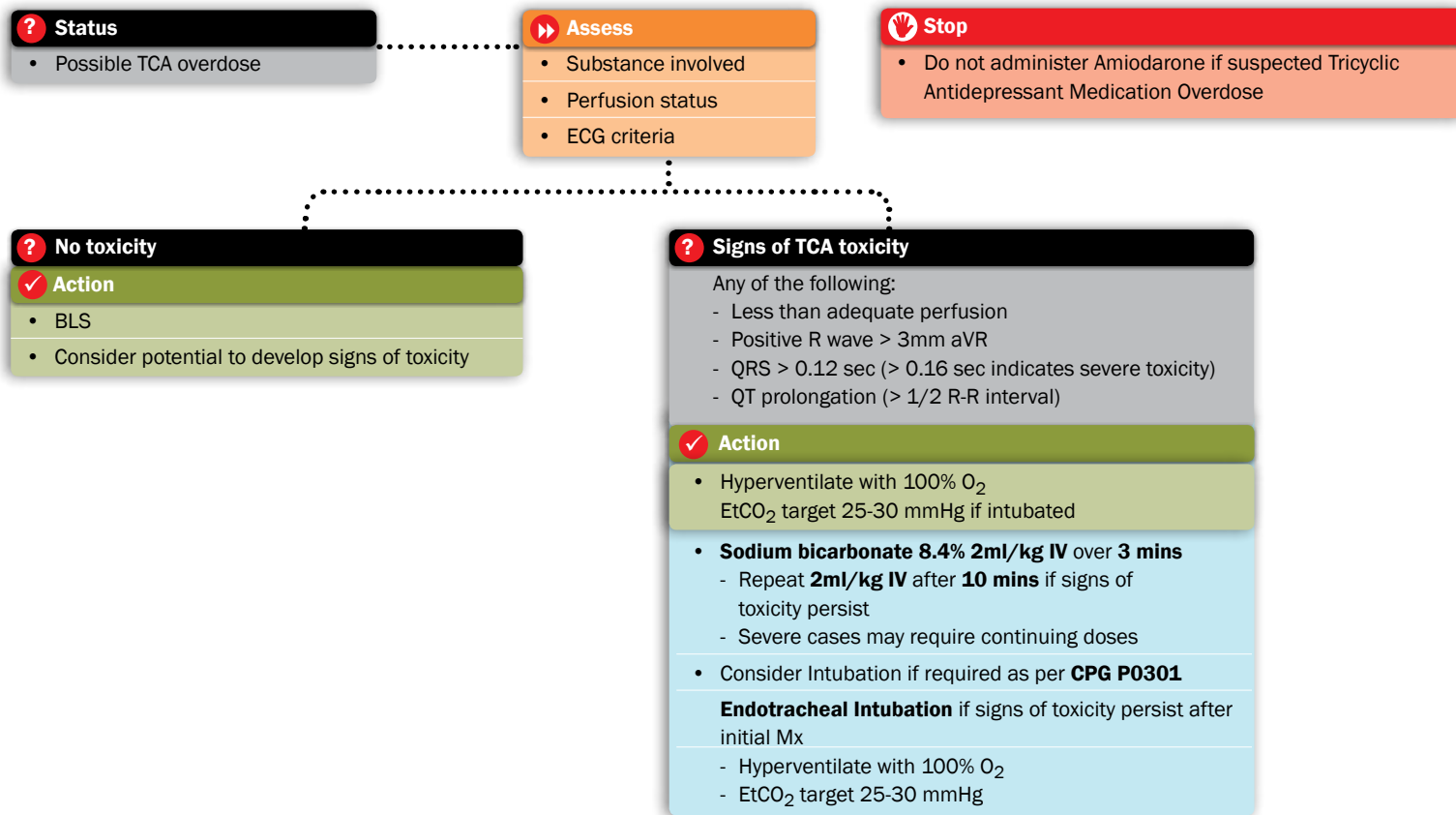
QTc is the corrected QT interval. QTc > 500 msec indicates toxicity with tricyclic overdose. MRX monitors are able to measure QTc when a 12 lead is taken.

- When performing Hyperventilation only in the TCA overdose, it is reasonable to target EtCO<sub>2</sub> to a range between 22-25mmHg.
- Caution must be used when administering Sodium Bicarbonate 8.4% and hyperventilation as the combination has been associated with fatal alkalaemia. Do not allow ETCO<sub>2</sub> to fall below 25mm Hg.
- Sodium Bicarbonate 8.4% should NEVER be administered to patients with a EtCO<sub>2</sub> below 25mmHg.

# Management of Overdose: Tricyclic Antidepressants (TCA) (Paediatric)

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**CPG P0707** (B)



**Management of Overdose:  
Tricyclic Antidepressants (TCA) (Paediatric) CPG P0707**



# Management of Overdose:

## Sedative Agents/Psychostimulants (Paediatric)

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**CPG P0707**

### Special Notes

- For young persons, Paramedics should strongly encourage them to make contact with a responsible adult.
- If Pt still refuses transport, repeat the advice using friend/relative assistance. Advise the Pt and responsible third person of follow up, counselling facilities and actions to take for immediate continuing care if symptoms reoccur.
- Paramedics should call the Police if in their professional judgement there appears to be factors that place the Pt at increased risk, such as:
  - is subject to violence (e.g. from a parent, guardian or care giver).
  - is likely to be, or is in danger of sexual exploitation
    - In particular for children where:
      - the supply of drugs appears to be from a parent/ guardian/care giver.
      - there is other evidence of child abuse/ maltreatment or evidence of serious untreated injuries.

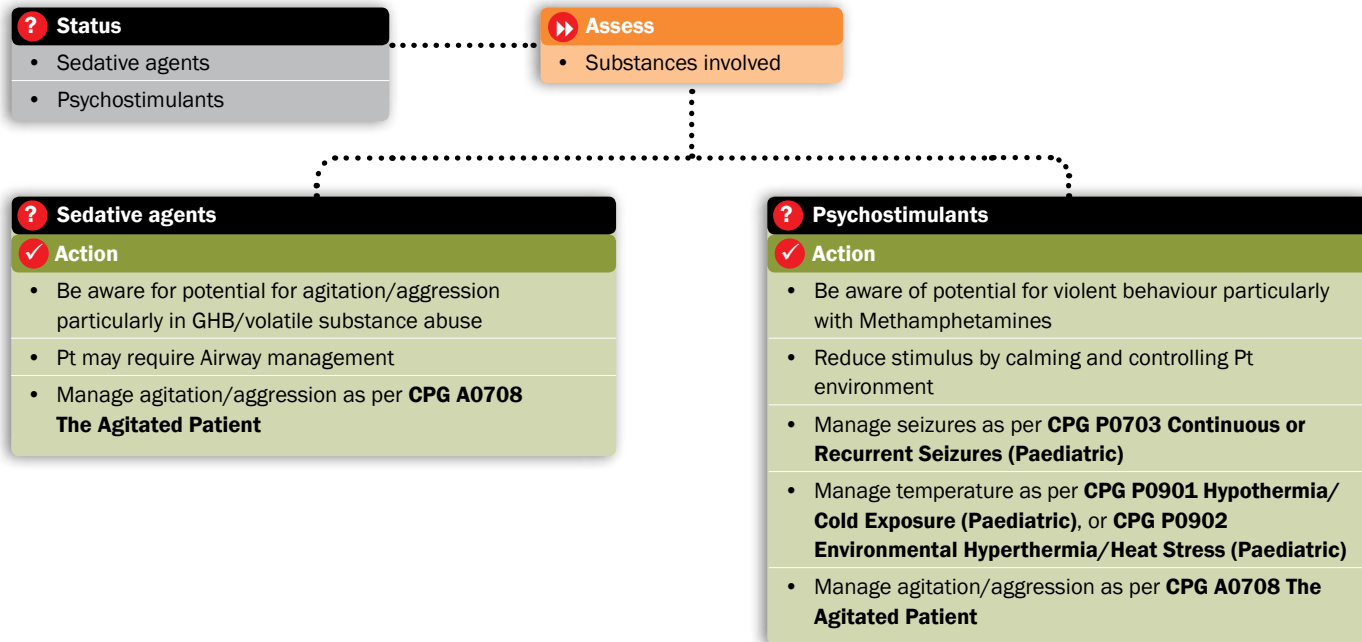
### Special Notes

- If Pt claims to have taken an overdose of a potentially life-threatening substance then they must be transported to hospital. Police assistance should be sought to facilitate this as required.
- Documentation of refusal and actions taken must be recorded on the PCR.

# Management of Overdose: Sedative Agents/Psychostimulants (Paediatric)

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**CPG P0707** (c)



**Management of Overdose:  
Sedative Agents/Psychostimulants (Paediatric) CPG P0707**

# Organophosphate Poisoning (Paediatric)

**CPG P0709**

## Special Notes

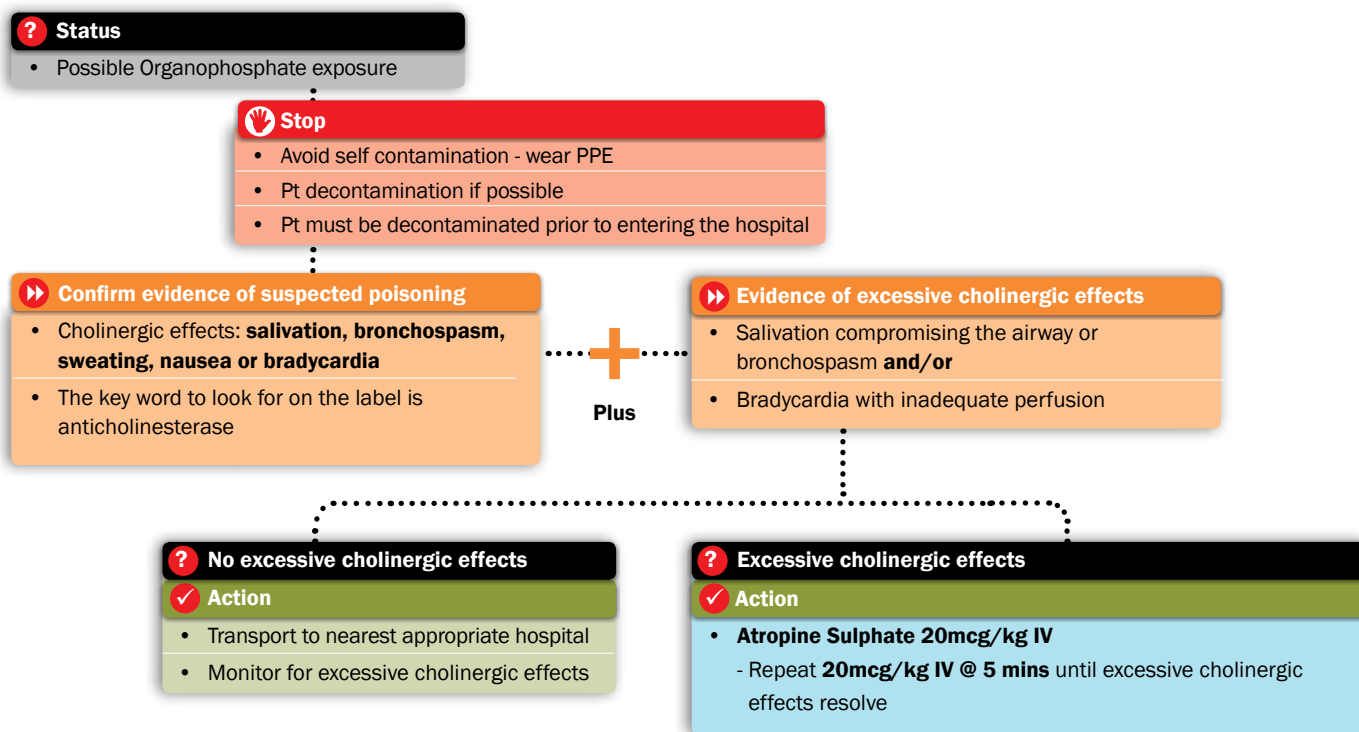
- Notification to receiving hospital essential to allow for Pt isolation.
- The key word to look for on the label is anticholinesterase. There are a vast number of organophosphates which are used not only used commercially but also domestically.
- If a potential contamination by a possible organophosphate has occurred, the container identifying trade and generic names should be identified and the Poisons Information Centre contacted for confirmation and advice.

## General Care

- Where possible, remove contaminated clothing and wash skin thoroughly with soap and water.
- If possible minimise the number of staff exposed.
- Attempt to minimise transfers between vehicles.

# Organophosphate Poisoning (Paediatric)

## CPG P0709













# Inadequate Perfusion Associated with Hypovolaemia (Paediatric)

## CPG P0801

### Special Notes

- Consider Tourniquet application for severe extremity bleeding unresponsive to direct pressure or where direct pressure is considered impractical.

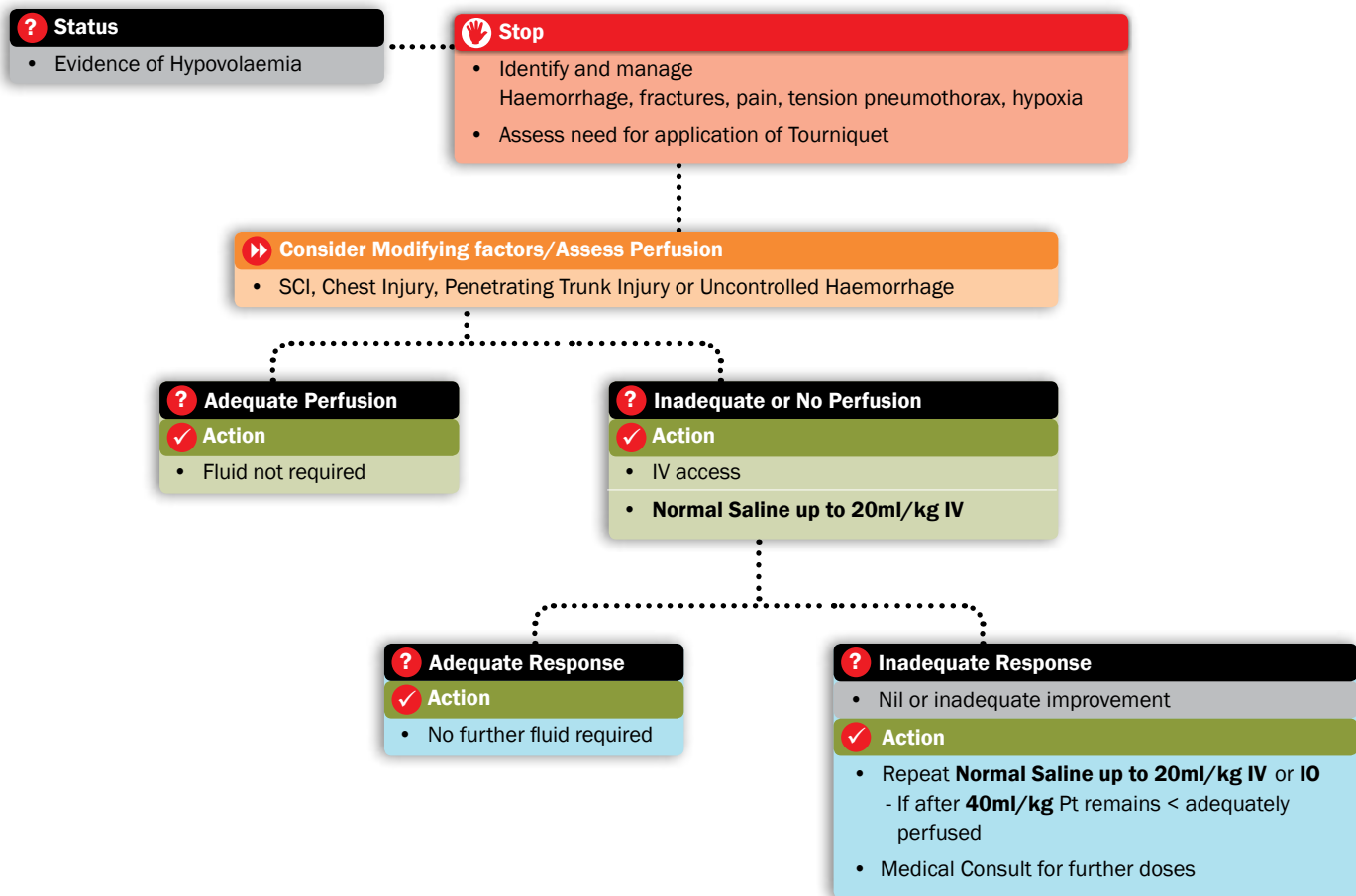
### General Care

- Titrate fluid administration to Pt response.
- Modifying factors must be considered and managed prior to aggressive fluid therapy.
- Always consider tension pneumothorax, particularly in the Pt with a chest injury, not responding to fluid therapy and persistently hypotensive.
- Excessive fluid should not be given if spinal cord injury is an isolated injury.
- If IV access is unable to be obtained and the Pt is obtunded, insert I/O.
- Pain relief as per **CPG P0501 Pain Relief (Paediatric)**
- Consider establishing IV en route. Do not delay transport for IV therapy.

### Modifying factors

- Complete spinal cord transection Rx as per **CPG A0804 Management of Potential Spinal Cord Injury**  
- Pt with isolated neurogenic shock can be given up to **5ml/kg Normal Saline** bolus to correct hypotension
- Chest injury - Consider tension pneumothorax Rx as per **CPG P0802 Chest Injury (Paediatric)**
- Penetrating Trunk Injury, suspected aortic aneurysm or uncontrolled haemorrhage - **Accept palpable carotid pulse with adequate conscious state and transport immediately**

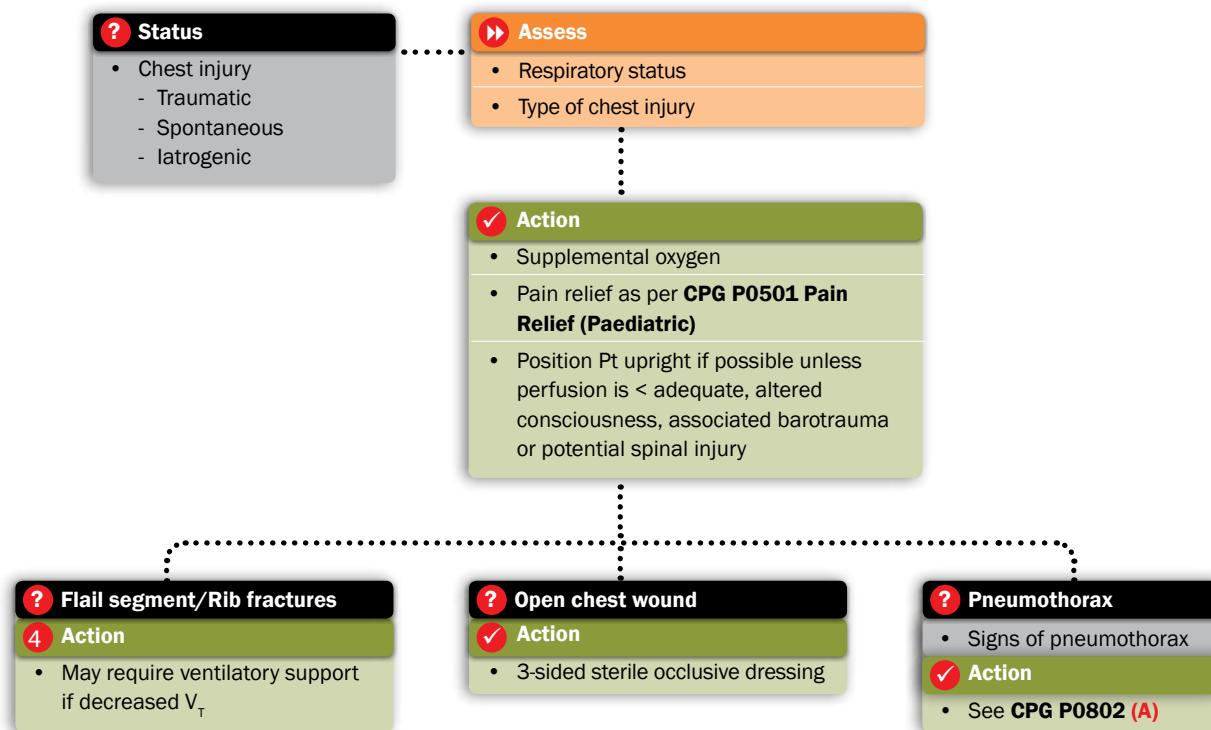
# Inadequate Perfusion Associated with Hypovolaemia (Paediatric)

**CPG P0801**




# Chest Injuries (Paediatric)

## CPG P0802





# Chest Injuries (Paediatric)

# CPG P0802

## Special Notes

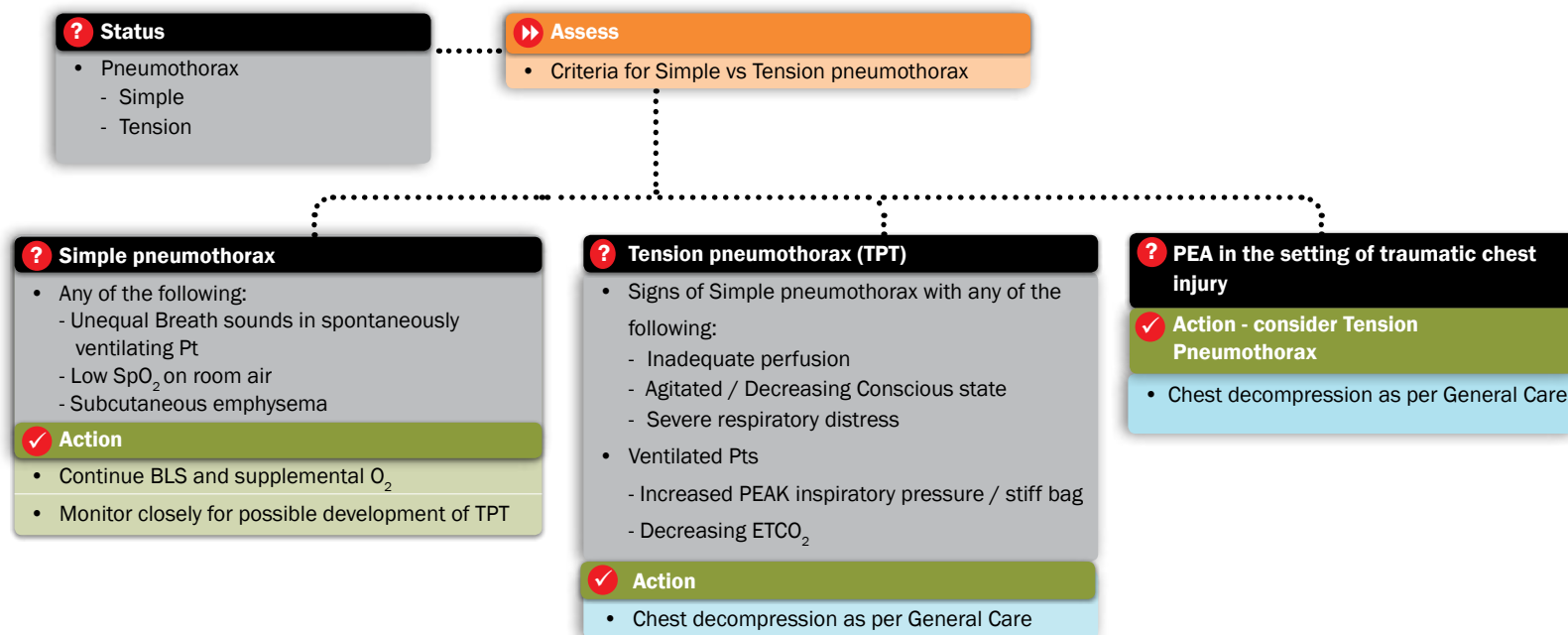
- In IPPV setting, equal air entry is **NOT** an exclusion criteria for TPT.
- Chest injury Pts receiving IPPV have a high risk of developing a TPT. Solution for poor perfusion in this setting includes bilateral chest decompression.
- Cardiac arrest Pts are at risk of developing chest injury during CPR.
- **Insertion site for Cannula**
  - Second intercostal space
  - Mid clavicular line (avoiding medial placement)
  - Above rib below (avoiding neurovascular bundle)
  - Right angles to chest (towards body of vertebrae)

## General Care

- **Tension Pneumothorax (TPT)**
  - If some clinical signs of TPT are present and the Pt is deteriorating with decreasing conscious state **and/** **or** poor perfusion, immediately decompress chest by inserting a long 16G cannula.
  - If air escapes, or air and blood bubble through the cannula, or no air/blood detected, leave in situ and secure.
  - If no air escapes but copious blood flows through the cannula then a major haemothorax is present. Cap cannula and secure.
- Trouble shooting
  - Pt may re-tension as lung inflates if catheter kinks off.
  - Catheter may also clot off. Flush with sterile **Normal Saline**.

# Chest Injuries (Paediatric)

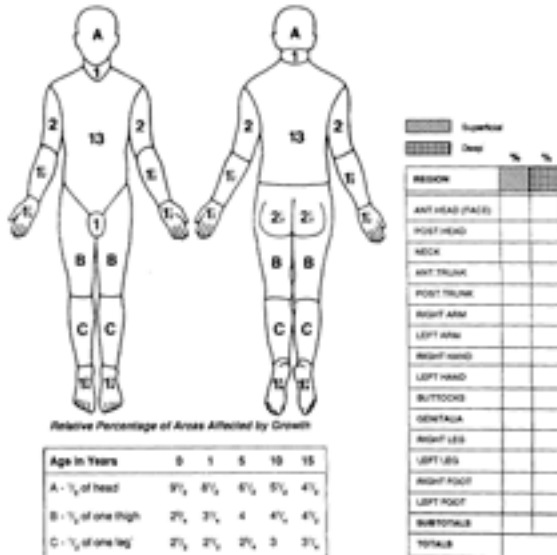
CPG P0802 (A)



# Paediatric Burns (Paediatric)

## CPG P0803

### Lund and Browder Burn Assessment Chart



### General Care

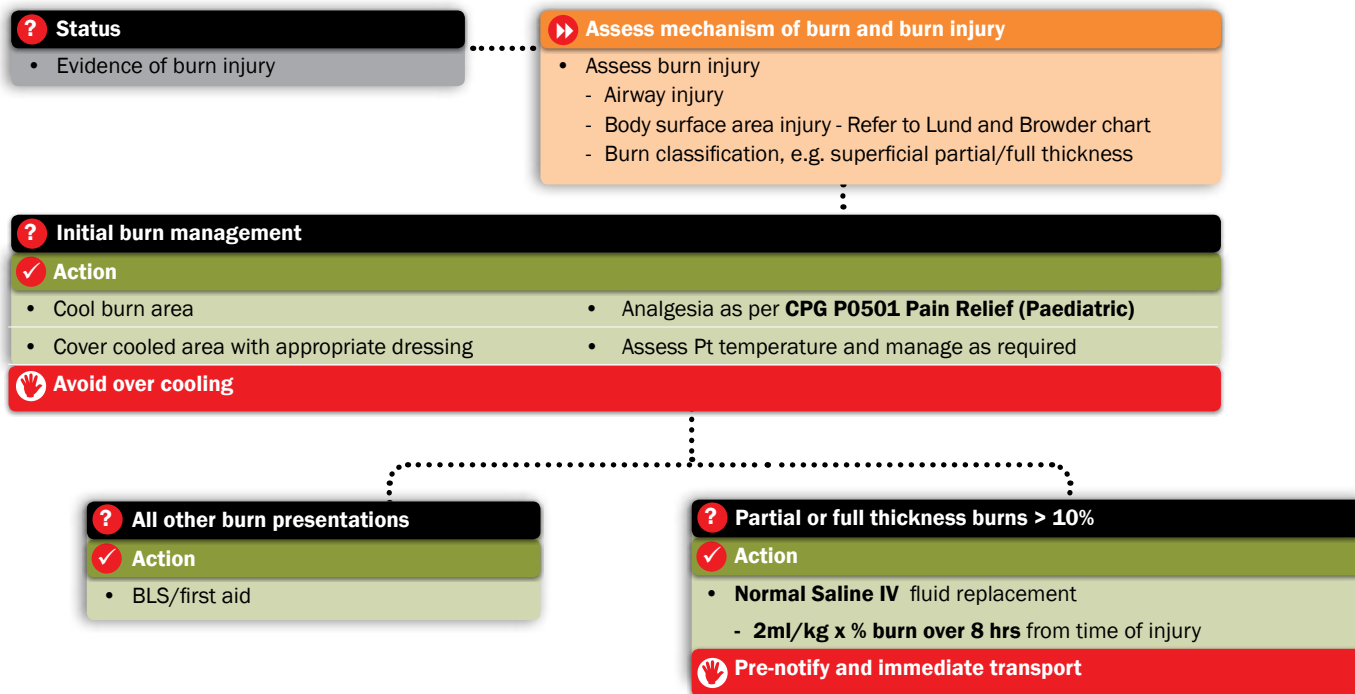
- Cool burn area for preferably up to 20 mins
  - Running water if possible
  - Normal Saline or wet combine as substitute
  - Avoid/eliminate shivering
  - Avoid ice or ice water

#### AVOID OVER COOLING

- Cover cooled area with appropriate dressing
  - Ensure cling wrap is applied longitudinally to allow for swelling.
- Assess Pt temp. and manage as required.
- Caution when considering fluid replacement for Pt with airway burns. Fluid therapy can lead to extensive systemic oedema and airway compromise. Consider early intubation.
- Volume replacement is for burn injury only. Manage other injuries accordingly including requirement for additional fluid.
- Consider additional fluid for major electrical burn.

# Paediatric Burns (Paediatric)

## CPG P0803













# Hypothermia/Cold Exposure (Paediatric)

## CPG P0901

### Special Notes

- Hypothermia is insidious and rarely occurs in isolation. Where the Pt is in a group environment other members of the group should be carefully assessed for signs of hypothermia.
- Arrhythmia in hypothermia is associated with temperatures below 33°C.
- Atrial arrhythmias, bradycardia, or atrioventricular block do not generally require treatment with anti-arrhythmic agents unless decompensated, and resolve on rewarming.
- Defibrillation and cardioactive drugs may not be effective at temperatures below 30°C. VF may resolve spontaneously upon re-warming.
- The onset and duration of drugs is prolonged in hypothermia and the interval between doses is therefore doubled, for example doses of **Adrenaline** become 6 minutes.
- Gentle handling of these Pt is essential. Position flat or lateral and avoid head up positioning.

### General Care

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

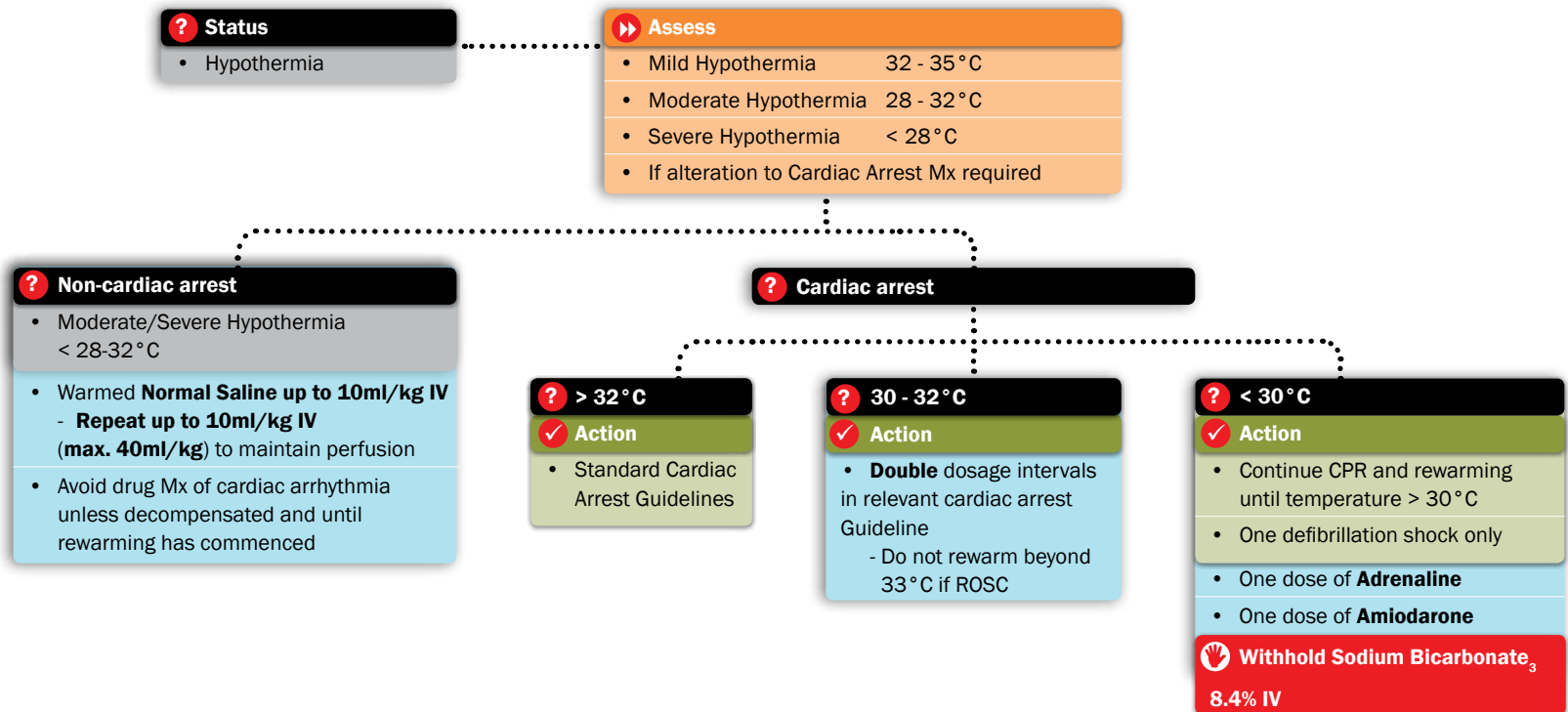
### Warmed fluid

- **Normal Saline** warmed between 37 - 42°C should be given to correct moderate/severe hypothermia and maintain perfusion (if available). Fluid < 37°C could be detrimental to Pt.

The use of aural or oral thermometers may be limited in assessing a patient in a Hypothermic emergency

# Hypothermia/Cold Exposure (Paediatric)

## CPG P0901



# Environmental Hyperthermia Heat Stress (Paediatric)

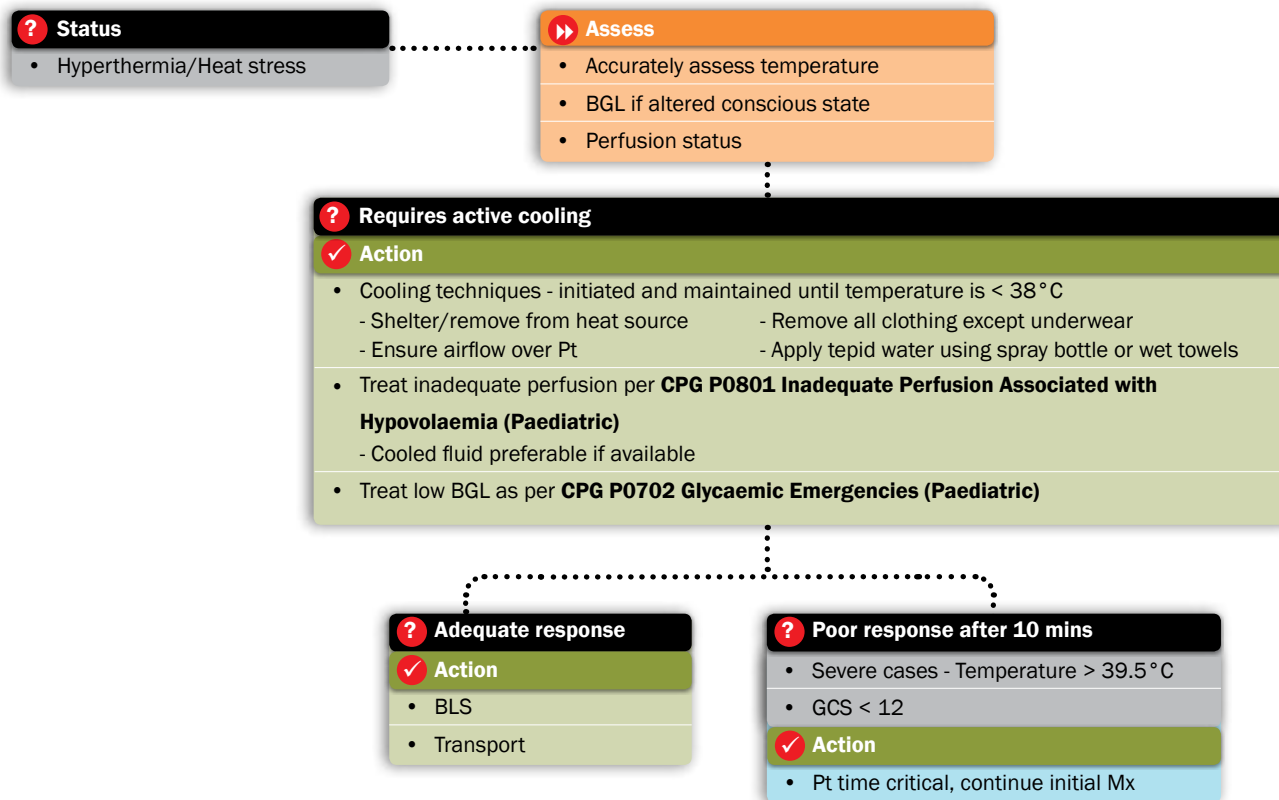
**CPG P0902**

## General Care

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

# Environmental Hyperthermia Heat Stress (Paediatric)

## CPG P0902









# Drug Presentation

# CPG D000

The drug section of these Guidelines has been specifically written to focus on the pharmacology relevant to selected medical emergencies. It is not intended that the pharmacology section of this booklet be seen as a standard text on pharmacology. Thus, the content has been restricted to Ambulance practice.

<b>Presentation</b>	<p>In many instances, drugs may be available in presentations other than those listed. However, this booklet indicates only those presentations that are currently carried on Ambulance vehicles.</p> <p>Drug Presentations as written can only be varied by the Chief Executive Officer (CEO) on the statutory role as Director of Ambulance Service. This will only be done through the release of a Clinical Services Update authorised by the CEO. This is the only circumstance where drug variations are permitted in ambulance service practice.</p>
<b>Pharmacology</b>	A statement is included as to the nature of the drug followed by a list of specific actions related to the Ambulance use of that drug.
<b>Metabolism</b>	A single statement has been included to indicate the fate of the particular drug within the body.
<b>Primary Emergency Indication</b>	The indications to those emergency situations for which the drug is primarily used within Ambulance practice. The drug however, may have other indications within health care.
<b>Contraindications</b>	If there are absolute contraindications to the use of a particular drug, these are indicated in this section.
<b>Precautions</b>	Where there are relative contraindications or precautions in the administration of a drug, these are included in this section.
<b>Route of Administration</b>	Most drugs can be administered through a variety of routes. However, this section includes only those routes of administration considered appropriate for use in Ambulance practice. As a general principle, drugs should not be mixed in the same syringe or solution before administration.
<b>Side Effects</b>	Common side effects attributed to the use of the drug are included in this section.
<b>Special Notes</b>	In this section a variety of additional information, in particular the time that the drug takes to have its effect, has been included as background information.



Presentation	6mg in 2ml amp
Pharmacology	AV nodal anti-arrhythmic
Metabolism	Adenosine is rapidly cleared from the circulation via cellular uptake
Primary Emergency Indication	1. Regular Supra-ventricular Tachycardia (SVT) ((narrow complex QRS <0.12s)) 2. Regular Supra-ventricular Tachycardia with ventricular aberrancy of conduction (SVT-A)
Contraindications	1. History of second or third degree heart block or sick sinus syndrome (except for patients with a functioning artificial pacemaker) 2. Sinus node disease, such as sick sinus syndrome 3. Chronic obstructive lung disease eg. Asthma 4. Known hypersensitivity to Adenosine. (Very rare)
Precautions	1. Current dipyramole therapy (Asantin, Persantin) 2. Pts on carbamazepine
Route of Administration	Intravenous (rapid push bolus)

<b>Side Effects</b>	<p>Adenosine has an extremely short half life: 6 to 10 seconds. Thus any adverse effects are self rectifying.</p> <ul style="list-style-type: none"> <li>- Facial Flushing</li> <li>- Dyspnoea</li> <li>- Headache</li> <li>- Anxiety</li> <li>- Bronchospasm</li> <li>- Hypotension</li> </ul> <p>Explain procedure and possible discomfort to patient. Has been known to cause feeling of impending doom to some patients.</p>
<b>Special Notes</b>	<p>Adenosine is not effective in converting atrial fibrillation, atrial flutter or ventricular tachycardia.</p> <p>If adenosine is administered for atrial fibrillation in a patient with Wolf-Parkinson-White syndrome (perhaps previously undiagnosed) the blockade of the SA node may lead to increased conduction via AV accessory pathway(s) and initiate ventricular fibrillation. Thus the field indications for adenosine include regular SVT only.</p> <p><i>Interactions:</i></p> <p>Caffeine, aminophylline and theophylline block the adenosine receptors and the full incremental dosage may be required.</p> <p>Carbamazepine ('Tegretol') can increase the level of atrioventricular block. Reduced dosage by half should be considered.</p> <p>Dipyramole (a platelet aggregation inhibitor) increases the plasma levels and cardiovascular effects of Adenosine. Reducing dose by half should be considered.</p> <p>Heart Transplant recipients should receive half doses.</p>

<b>Presentation</b>	1mg in 1ml amp (1:1,000)
<b>Pharmacology</b>	<p>A naturally occurring Alpha and Beta-adrenergic stimulant</p> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- Increases pulse rate by increasing S.A. Node firing rate (Beta 1)</li> <li>- Increases conduction velocity through the A.V. Node (Beta 1)</li> <li>- Increases myocardial contractility (Beta 1)</li> <li>- Increases the irritability of the ventricles (Beta 1)</li> <li>- Causes bronchodilatation (Beta 2)</li> <li>- Causes peripheral vasoconstriction (Alpha)</li> </ul>
<b>Metabolism</b>	By monoamine oxidase and other enzymes in blood, liver and around nerve endings and excreted by the kidneys
<b>Primary Emergency Indications</b>	<ol style="list-style-type: none"> <li>1. Persistent ventricular fibrillation or unconscious pulseless ventricular tachycardia</li> <li>2. Asystole</li> <li>3. Electro-mechanical dissociation/PEA</li> <li>4. Inadequate perfusion (Cardiogenic)</li> <li>5. Inadequate perfusion (Non Cardiogenic – Non Hypovolaemic)</li> <li>6. Anaphylactic reactions</li> <li>7. Severe asthma</li> <li>8. Unconscious asthma with no blood pressure</li> <li>9. Croup or suspected croup/ epiglottitis.</li> <li>10. Bradycardia with poor perfusion</li> </ol>
<b>Contraindication</b>	Hypovolaemic shock without adequate fluid replacement

# Adrenaline

## CPG D003

<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Elderly Pts</li> <li>2. Pts with cardiovascular disease</li> <li>3. Pts on monoamine oxidase (MAO) inhibitors</li> <li>4. Pts on Beta blockers as higher doses may be required</li> </ol>
<b>Route of Administration</b>	Intravenous Intramuscular Endotracheal Nebuliser Intravenous Infusion Intraosseous
<b>Side Effects</b>	Sinus tachycardia Supraventricular arrhythmias Ventricular arrhythmias Hypertension Pupillary dilatation May increase size of myocardial infarction Feeling of "anxiety/palpitations" in the conscious Pt Muscle tremor
<b>Special Notes</b>	Intravenous Adrenaline should be reserved for life threatening situations.  <i>Intravenous effects:</i> Onset: 30sec Peak: 3 – 5min Duration: 5 – 10min  <i>Intramuscular effects:</i> Onset: 30 – 90sec Peak: 4 – 10min Duration: 5 – 10min

# Amiodarone

# CPG D004

<b>Presentation</b>	150mg in 3ml amp
<b>Pharmacology</b>	A Class III anti-arrhythmic agent
<b>Metabolism</b>	By the liver
<b>Primary Emergency Indications</b>	<ol style="list-style-type: none"> <li>1. Ventricular Fibrillation/Pulseless Ventricular Tachycardia refractory to cardioversion</li> <li>2. Sustained or recurrent Ventricular Tachycardia</li> </ol>
<b>Contraindications</b>	<ol style="list-style-type: none"> <li>1. <i>Ventricular Tachycardia</i> <ul style="list-style-type: none"> <li>- Inadequate perfusion and deteriorating rapidly</li> <li>- Pregnancy</li> </ul> </li> <li>2. Known hypersensitivity to Amiodarone or Iodine.</li> <li>3. Tricyclic antidepressant medication Overdose</li> </ol>
<b>Precautions</b>	Nil of significance in above indications
<b>Route of Administration</b>	Intravenous
<b>Side Effects</b>	<ul style="list-style-type: none"> <li>• Hypotension</li> <li>• Bradycardia</li> </ul>
<b>Special Notes</b>	<p><i>Intravenous effects (bolus):</i></p> <p>Onset: 2min  Peak: 20min  Duration: 120min</p> <p><b>Amiodarone is incompatible with saline. Glucose 5% must be used as dilutant when administered to the conscious Pt.</b></p>

# Aspirin (Acetylsalicylic Acid)

## CPG D005

<b>Presentation</b>	300mg chewable tablets 300mg soluble or water dispersible tablets
<b>Pharmacology</b>	An analgesic, antipyretic, anti-inflammatory and antiplatelet aggregation agent. <i>Actions:</i> - Reduces platelet aggregation - Inhibits synthesis of prostaglandins - anti-inflammatory actions
<b>Metabolism</b>	Converted to salicylate in the gut mucosa and liver, excreted mainly by the kidneys
<b>Primary Emergency Indication</b>	To minimize platelet aggregation and thrombus formation in order to retard the progression of coronary artery thrombosis in acute coronary syndrome
<b>Contraindications</b>	<ol style="list-style-type: none"> <li>1. Hypersensitivity to aspirin/salicylates</li> <li>2. Actively bleeding peptic ulcers</li> <li>3. Bleeding disorders</li> <li>4. Suspected dissecting aortic aneurysm</li> <li>5. Chest pain associated with psychostimulant overdose if BP &gt; 160</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Peptic ulcer</li> <li>2. Asthma</li> <li>3. Pts on anti-coagulants, e.g. Warfarin</li> </ol>
<b>Route of Administration</b>	Oral
<b>Side Effects</b>	<ul style="list-style-type: none"> <li>• Heartburn, nausea, gastrointestinal bleeding</li> <li>• Increased bleeding time</li> <li>• Hypersensitivity reactions</li> </ul>
<b>Special Notes</b>	<p>Aspirin is contra-indicated for use in acute febrile illness in pts less than 12 years of age as it may lead to renal function impairment and Reye's syndrome.</p> <p>The anti-platelet effects of Aspirin persists for the natural life of platelets</p> <p>Aspirin is absorbed from the stomach and duodenum to reach peak levels within 15 mins and has a half-life of approximately 30 mins. <b>It is therefore important to administer Aspirin for suspected AMI even if patient is on daily dose</b></p>

<b>Presentation</b>	1.2 mg in 1ml amp
<b>Pharmacology</b>	<p>An anticholinergic agent</p> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- inhibits the actions of acetylcholine on post-ganglionic cholinergic nerves at the neuro-effector site, e.g. as a vagal blocker and allows sympathetic effect to: <ul style="list-style-type: none"> <li>- increase pulse rate by increasing S.A. Node firing rate</li> <li>- increase the conduction velocity through the A.V. Node</li> </ul> </li> <li>- antidote to reverse the effects of cholinesterase inhibitors, e.g. organophosphate insecticides, at the post-ganglionic neuro-effector sites of cholinergic nerves, i.e. reduces the excessive salivary, sweat, gastrointestinal, and bronchial secretions, and relaxes smooth muscles.</li> </ul>
<b>Metabolism</b>	By the liver and excreted mainly by the kidneys
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Bradycardia with less than adequate perfusion</li> <li>2. Organophosphate poisoning with excessive cholinergic effects</li> <li>3. Nerve agent poisoning</li> </ol>
<b>Contraindication</b>	Nil of significance in the above indications
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Atrial flutter</li> <li>2. Atrial fibrillation</li> <li>3. Do not increase heart rate above 100/min except in children under 6 years</li> <li>4. Glaucoma</li> </ol>

<b>Route of Administration</b>	Intravenous Intramuscular Intraosseous
<b>Side Effects</b>	Tachycardia Palpitations Dry mouth Dilated pupils Visual blurring Retention of urine Confusion, restlessness (in large doses) Hot, dry skin (in large doses)
<b>Special Notes</b>	<i>Intravenous effects:</i> Onset: < 2min Peak: < 5min Duration: 2 – 6hrs



# Ceftriaxone

# CPG D007

<b>Presentation</b>	1g sterile powder in vial
<b>Pharmacology</b>	Cephalosporin Antibiotic
<b>Metabolism</b>	Excreted unchanged in urine (33% - 67%) and in bile
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Suspected Meningococcal Septicaemia</li> <li>2. Severe Sepsis (Consult only)</li> </ol>
<b>Contraindication</b>	Allergy to Cephalosporin Antibiotics
<b>Precautions</b>	Allergy to Penicillin Antibiotics
<b>Route of Administration</b>	Intravenous route (preferred) Intramuscular route (if IV access unable to be obtained)
<b>Side Effects</b>	Nausea and Vomiting Skin Rash
<b>Special Notes</b>	<p>Usual dose: Adult 2g IV or IM            Paediatric 100mg/kg IV or 50mg/kg IM (Max = 2g IV or IM)</p> <p>Ceftriaxone IV must be made up to 10ml using normal saline and administered over 2 minutes.</p> <p>Ceftriaxone IM must be made up to 4ml using 1% Lignocaine and administered in the lateral upper thigh. (Ceftriaxone without Lignocaine is extremely painful)</p> <p>Expect possible deterioration in a subgroup of patients following Ceftriaxone administration</p>

# Dexamethasone

## CPG D008

<b>Presentation</b>	8mg in 2ml Glass Vial
<b>Pharmacology</b>	A corticosteroid secreted by the adrenal cortex <i>Action:</i> Relieves inflammatory reactions and provides immunosuppression
<b>Metabolism</b>	By the liver and other tissues, and excreted predominantly by the kidneys
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Bronchospasm associated with acute respiratory distress not responsive to nebulised Salbutamol</li> <li>2. Anaphylaxis</li> <li>3. Acute Exacerbation of COPD</li> <li>4. Suspected Croup</li> </ol>
<b>Contraindication</b>	Known hypersensitivity to Dexamethasone or other corticosteroids
<b>Precautions</b>	Usually only relevant with prolonged use and high doses
<b>Route of Administration</b>	Intravenous and Intramuscular
<b>Side Effects</b>	Except for allergic reactions, adverse effects are usually only associated with prolonged use and high doses
<b>Special Notes</b>	<p>Does not contain an antimicrobial agent, therefore use solution immediately and discard any residue</p> <p><i>Intravenous effects:</i></p> <p>Onset: 30 – 60min</p> <p>Peak: 2hrs</p> <p>Duration: 36 – 72hrs</p>



# Ergometrine

## CPG D009

<b>Presentation</b>	500 mcg in 1 ml 250 mcg in 1 ml – amp
<b>Pharmacology</b>	Causes contraction of the uterus and vascular smooth muscle General vasoconstriction
<b>Metabolism</b>	Principally by the liver
<b>Primary Emergency Indication</b>	Post-partum and post-abortion haemorrhage greater than 600 mls, when it is certain that all foetuses have delivered
<b>Contraindication</b>	1. Known allergy 2. Past Hx of pre-eclampsia (Pregnancy induced hypertension) 3. Hypertension
<b>Precautions</b>	Nil of significance for this indication
<b>Route of Administration</b>	Intravenous (given slowly)
<b>Side Effects</b>	Allergic reaction - anaphylaxis Hypertension
<b>Special Notes</b>	<p>The human uterus becomes more sensitive to oxytocics in the course of pregnancy and becomes most sensitive near the time of parturition.</p> <p>Ergometrine produces a firm tonic contraction within 5 minutes lasting 90 mins.</p> <p><i>Storage:</i></p> <p>Refrigerated at below 8°</p> <p>- Ampules should have an expiry date marked two months from time it is removed from refrigeration</p> <p><i>Intravenous effects:</i></p> <p>Onset: immediate</p>

# Fentanyl

# CPG D010

<b>Presentation</b>	100mcg in 2ml amp, 250mcg in 1ml (IN use only)
<b>Pharmacology</b>	<p>A synthetic narcotic analgesic</p> <p><i>Actions:</i></p> <p>Central Nervous System effects:</p> <ul style="list-style-type: none"> <li>- Depression – leading to analgesia</li> <li>- Respiratory depression – leading to apnoea</li> <li>- Dependence (addiction)</li> </ul> <p><i>Cardiovascular effects:</i></p> <ul style="list-style-type: none"> <li>- Decreases conduction velocity through the A.V. Node</li> </ul>
<b>Metabolism</b>	By the liver and excreted by the kidneys
<b>Primary Emergency Indications</b>	<ol style="list-style-type: none"> <li>1. Analgesia – IV/IN</li> <li>2. Sedation to maintain intubation</li> </ol>
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Known hypersensitivity</li> <li>2. Active labour</li> <li>3. Epistaxis or occluded nasal passages (IN use)</li> <li>4. Patients &lt; 1 year old</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Elderly Pts</li> <li>2. Respiratory depression, e.g. COPD</li> <li>3. Current asthma</li> <li>4. Known addiction to narcotics</li> <li>5. Monoamine Oxidase Inhibitors</li> </ol>

<b>Route of Administration</b>	Intravenous Intranasal
<b>Side Effects</b>	Respiratory depression Apnoea Rigidity of the diaphragm and intercostal muscles Bradycardia
<b>Special Notes</b>	<p>Fentanyl is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility.</p> <p>Respiratory depression can be reversed with Naloxone Hydrochloride.</p> <p>Respiratory depression as a side effect will last longer than the analgesic effects.</p> <p><b>100mcg Fentanyl</b> is equivalent in analgesic activity to <b>10mg Morphine</b>.</p> <p><i>Intravenous effects:</i></p> <p>Onset: Immediate</p> <p>Peak: &lt; 5min</p> <p>Duration: 30 – 60min</p>

# Frusemide

# CPG D011

<b>Presentation</b>	20mg in 2ml amp (Other presentations exist)
<b>Pharmacology</b>	A diuretic <i>Actions:</i> - Causes venous dilatation and reduces venous return - Promotes diuresis
<b>Metabolism</b>	Excreted by the kidneys
<b>Primary Emergency Indication</b>	Acute left ventricular failure with evidence of fluid overload
<b>Contraindication</b>	Nil of significance in the above indication
<b>Precautions</b>	Hypotension
<b>Route of Administration</b>	Intravenous – administer slowly (2 -5min)
<b>Side Effects</b>	Hypotension Dysrhythmia due to electrolyte imbalance
<b>Special Notes</b>	The effect of vasopressor drugs will often be reduced after treatment with Frusemide. <i>Intravenous effects:</i> Onset: 5min Peak: 20 – 60min Duration: 2 – 3hrs Also known as Furosemide

# Glucagon

## CPG D012

<b>Presentation</b>	1mg (IU) in 1ml Hypokit
<b>Pharmacology</b>	<p>A hormone normally secreted by the pancreas</p> <p><i>Actions:</i></p> <p>Causes an increase in blood glucose concentration by converting stored liver glycogen to glucose</p> <p>Has a weak chronotropic and inotropic action</p>
<b>Metabolism</b>	Mainly by the liver, also by the kidneys and in the plasma
<b>Primary Emergency Indication</b>	Diabetic hypoglycaemia (Random Blood Glucose analysis < 4mmol/l) in Pts with an altered conscious state who are unable to self-administer oral glucose paste
<b>Contraindication</b>	Nil of significance in the above indication
<b>Precautions</b>	Nil of significance in the above indication
<b>Route of Administration</b>	Intramuscular
<b>Side Effects</b>	Nausea and vomiting (rare)
<b>Special Notes</b>	<p>Not all Pts will respond to Glucagon, for example those with inadequate glycogen storage in the liver – alcoholics, malnourishment.</p> <p><i>Intramuscular effects:</i></p> <p>Onset: 3 – 5min</p> <p>Peak:</p> <p>Duration: 12 – 25min</p>



# Glucose 5%

# CPG D013

<b>Presentation</b>	100ml infusion soft pack
<b>Pharmacology</b>	<p>An isotonic crystalloid solution</p> <p><i>Composition:</i></p> <ul style="list-style-type: none"> <li>- Sugar – 5% dextrose</li> <li>- Water</li> </ul> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- Provides a small source of energy</li> <li>- Supplies body water</li> </ul>
<b>Metabolism</b>	<p><i>Dextrose:</i></p> <ul style="list-style-type: none"> <li>- Broken down in most tissues</li> <li>- Stored in liver and muscle as glycogen</li> </ul> <p><i>Water:</i></p> <ul style="list-style-type: none"> <li>- Excreted by the kidneys</li> <li>- Distributed throughout total body water, mainly in the extracellular fluid compartment</li> </ul>
<b>Primary Emergency Indication</b>	Vehicle for dilution and administration of intravenous emergency drugs
<b>Contraindication</b>	Nil of significance in the above indication
<b>Precautions</b>	Nil of significance in the above indication
<b>Route of Administration</b>	Intravenous infusion
<b>Side Effects</b>	Nil of significance in the above indication
<b>Special Notes</b>	<p><i>Intravascular half life:</i></p> <p>Approximately 20 - 40min</p>

# Glucose 10%

# CPG D014

<b>Presentation</b>	50g in 500ml infusion soft pack
<b>Pharmacology</b>	<p>A slightly hypertonic crystalloid solution</p> <p><i>Composition:</i></p> <ul style="list-style-type: none"> <li>- Sugar – 10% dextrose</li> <li>- Water</li> </ul> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- Provides a source of energy</li> <li>- Supplies body water</li> </ul>
<b>Metabolism</b>	<p><i>Glucose:</i></p> <ul style="list-style-type: none"> <li>- Broken down in most tissues</li> <li>- Stored in liver and muscle as glycogen</li> </ul> <p><i>Water:</i></p> <ul style="list-style-type: none"> <li>- Excreted by the kidneys</li> <li>- Distributed throughout total body water, mainly in the extracellular fluid compartment</li> </ul>
<b>Primary Emergency Indication</b>	Diabetic hypoglycaemia (Random Blood Glucose analysis < 4mmol/L) in Pts with an altered conscious state who are unable to self-administer oral glucose
<b>Contraindication</b>	Nil of significance in the above indication
<b>Precautions</b>	Nil of significance in the above indication
<b>Route of Administration</b>	Intravenous infusion
<b>Side Effects</b>	Nil of significance in the above indication
<b>Special Notes</b>	<p><i>Intravenous effects:</i></p> <p>Onset: 3 min</p> <p>Peak:</p> <p>Duration: Depends on severity of hypoglycaemic episode</p>



# Glucose Paste

# CPG D015

<b>Presentation</b>	15g Glucose paste
<b>Pharmacology</b>	A hypertonic sugar solution for oral use
<b>Metabolism</b>	<i>Glucose:</i> - Broken down in most tissues - Stored in liver and muscle as glycogen
<b>Primary Emergency Indication</b>	Diabetic hypoglycaemia (Random Blood Glucose analysis < 4mmol/l) in Pts who are conscious and able to self-administer oral glucose
<b>Contraindication</b>	Nil of significance in the above indication
<b>Precautions</b>	Nil of significance in the above indication
<b>Route of Administration</b>	Oral
<b>Side Effects</b>	Nil of significance in the above indication
<b>Special Notes</b>	

# Glyceryl Trinitrate (GTN)

## CPG D016

<b>Presentation</b>	0.4 mg sublingual spray 50mg in 10ml glass ampoule 50mg Transdermal Patch (VAO only)
<b>Pharmacology</b>	<p>Principally, a vascular smooth muscle relaxant</p> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- Venous dilatation promotes venous pooling and reduces venous return to the heart (reduces preload)</li> <li>- Arterial dilatation reduces systemic vascular resistance and arterial pressure (reduces after load)</li> </ul> <p><i>The effects of the above are to:</i></p> <ul style="list-style-type: none"> <li>- reduce myocardial oxygen demand</li> <li>- reduce systolic, diastolic and mean arterial blood pressure, whilst usually maintaining coronary perfusion pressure</li> <li>- Mild collateral coronary arterial dilatation may improve blood supply to ischemic areas of myocardium</li> <li>- Mild tachycardia secondary to slight fall in blood pressure</li> </ul>
<b>Metabolism</b>	Hepatic
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Chest pain associated with Acute Coronary Syndrome</li> <li>2. Acute left ventricular failure (Pulmonary Oedema)</li> <li>3. Hypertension associated with Acute Coronary Syndrome</li> <li>4. Autonomic Dysreflexia</li> </ol>
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Known hypersensitivity</li> <li>2. Systolic blood pressure &lt; 100 mmHg (Buccal/Sub-lingual)</li> <li>3. Systolic blood pressure &lt;120 mmHg (Intravenous)</li> <li>4. Sildenafil Citrate "VIAGRA" or Vardenafil "LEVITRA" administration in the previous 24 hours or Tadalafil "CIALIS" administration in the previous 4 days (PDE5 inhibitors)</li> <li>5. Heart rate &gt; 150 per min</li> <li>6. Heart rate &lt; 50 per min (excluding Autonomic Dysreflexia)</li> <li>7. Ventricular Tachycardia</li> <li>8. Right Ventricular Infarct</li> </ol>

# Glyceryl Trinitrate (GTN)

## CPG D016

<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. No previous administration</li> <li>2. Elderly patients</li> <li>3. Recent acute myocardial infarction</li> <li>4. Inferior STEMI with systolic BP &lt; 160 mmHg</li> <li>5. Avoid skin contact with concentrated solution</li> <li>6. Always reduce BP slowly rather than aggressively (IV GTN)</li> </ol>
<b>Route of Administration</b>	Buccal, Sub-lingual or Intravenous, Topical (VAO only)
<b>Side Effects</b>	<p>Tachycardia  Hypotension  Headache  Skin flushing (uncommon)  Bradycardia (occasionally)</p>
<b>Special Notes</b>	<p><b>Storage:</b>  Do not administer the patient's own medication, as its storage may not have been in optimum conditions or may be old. Tablets should be discarded and replaced after 1 month.</p> <p>Since both men and women can be prescribed Sildenafil Citrate "VIAGRA" or Vardenafil "LEVITRA" or Tadalafil "CIALIS" all patients should be asked if and when they last have had the drug to determine if Glyceryl Trinitrate is contraindicated.</p> <p>Intravenous GTN is ONLY to be administered in incidents of Pulmonary Oedema.</p> <p><b>Buccal effects:</b>  Onset: 30 sec – 2 min  Peak: 5 – 10 min  Duration: 15 – 30 min</p>

# Ipratropium Bromide (Atrovent)

## CPG D017

<b>Presentation</b>	500mcg in 1ml polyamp
<b>Pharmacology</b>	Anticholinergic bronchodilator <i>Actions:</i> allows bronchodilatation by inhibiting cholinergic bronchomotor tone (i.e. blocks vagal reflexes which mediate bronchoconstriction)
<b>Metabolism</b>	Excreted by the kidneys
<b>Primary Emergency Indication</b>	Severe respiratory distress associated with bronchospasm
<b>Contraindication</b>	Known hypersensitivity to Atropine or its derivatives
<b>Precautions</b>	1. Glaucoma 2. Avoid contact with eyes
<b>Route of Administration</b>	Nebulised in combination with Salbutamol
<b>Side Effects</b>	Headache Nausea Dry mouth Skin Rash Tachycardia (rare) Palpitations (rare) Acute angle closure glaucoma secondary to direct eye contact (rare)

# Ipratropium Bromide (Atrovent)

**CPG D017****Special Notes**

There have been isolated reports of ocular complications (mydriasis, increased intraocular pressure, acute angle glaucoma, eye pain) as a result of direct eye contact of Ipratropium Bromide formulations

The nebuliser mask must therefore be fitted properly during inhalation and care taken to avoid Ipratropium Bromide solution entering the eyes

Ipratropium Bromide must be nebulised in conjunction with Salbutamol and is to be administered as a single dose only

Onset:	3 – 5min
Peak	1.5 – 2hrs
Duration:	6hrs



# Ketamine

## CPG D018

<b>Presentation</b>	200 mg in 2 ml amp
<b>Pharmacology</b>	<p>Ketamine is an intravenous anesthetic agent.</p> <p>At lower doses it is a significant analgesic whilst preserving airway reflexes and respiratory drive.</p> <p>There is minimal haemodynamic compromise as Ketamine acts as a sympathomimetic which may lead to transient tachycardia and hypertension.</p> <p>Ketamine produces a dissociative state that in a small number of patients may potentially cause them to have issues with perception resulting in disinhibition or emergence phenomenon.</p>
<b>Metabolism</b>	Metabolized by the liver and excreted by the kidneys.
<b>Primary Emergency Indication</b>	<p>Enhanced pain relief in patients with borderline or inadequate perfusion associated with</p> <ul style="list-style-type: none"> <li>• Uncontrolled Musculoskeletal Pain</li> <li>• Severe burns</li> </ul>
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Known hypersensitivity</li> <li>2. Age &lt;1 year</li> <li>3. Traumatic Head Injury</li> <li>4. Hypertension BP &gt; 180mm Hg sys, 100mm Hg Dia</li> <li>5. Suspected Acute Coronary Syndrome</li> <li>6. Suspected Heart Failure</li> <li>7. Known Hydrocephalus or raised intraocular pressure</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Age &gt; 60yrs</li> <li>2. Prior administration of midazolam or other CNS depressant drugs</li> <li>3. Significant hypovolaemia</li> <li>4. Globe injury</li> <li>5. Complex facial injuries and fractures</li> <li>6. Impaired respiratory function</li> <li>7. Symptoms of psychosis</li> </ol>

Route of Administration	Intravenous
Side Effects	<p>Dissociation and trance like state</p> <p>Potential transient hypertonicity and nystagmus</p> <p>Disinhibition – disturbed perception</p> <p>Emergence</p> <p>Hypertension, Tachycardia</p> <p>CNS and rarely respiratory depression</p> <p>Hypersalivation</p> <p>Vomiting</p> <p>Laryngospasm</p>
Special Notes	<p>Hypertonicity and nystagmus are transient reactions which do not require intervention or treatment. These should not be confused with significant disinhibition.</p> <p>Disinhibition – disturbed perception during initial administration. If the pt does not respond to attempts at reassurance and calming, a small dose of Midazolam may be required as per Pain Relief CPG</p> <p>Emergence issues with distorted perception as the drug wears off will generally settle with removal of significant stimulation however small doses of Midazolam 0.5mg IV may be required if this fails. (Refer to CPG A0501 - Pain Relief)</p> <p>Onset            30 sec</p> <p>Peak             30 - 60 sec</p> <p>Duration        5-20 mins</p>

# Lignocaine Hydrochloride

## CPG D019

<b>Presentation</b>	100 mg in 5 ml amp (1%)
<b>Pharmacology</b>	A local anaesthetic agent Actions: Prevents initiation and transmission of nerve impulses causing local anaesthesia (1% solution)
<b>Metabolism</b>	Hepatic (90%) Excreted unchanged by the kidneys (10%)
<b>Primary Emergency Indication</b>	1. Diluent for Ceftriaxone for IM administration in suspected meningococcal disease as a 1% solution
<b>Contraindication</b>	1. Known hypersensitivity 2. Bradycardia with inadequate perfusion 3. Evidence of 2° or 3° heart block
<b>Precautions</b>	1. When using Lignocaine 1% as diluent for IM Ceftriaxone it is important to rule out inadvertent IV administration due to potential CNS complications
<b>Route of Administration</b>	Intravenous /Intramuscular (1% solution with Ceftriaxone only)
<b>Side Effects</b>	Intramuscular administration (1% solution) Nil – unless inadvertent intravenous administration occurs.
<b>Special Notes</b>	<p><i>Intramuscular effects (1% solution):</i></p> <p>Onset: Rapid</p> <p>Peak:</p> <p>Duration: 60 - 90min</p> <p><i>Intravenous effects:</i></p> <p>1 - 4min</p> <p>5 - 10min</p> <p>20min</p> <p>At therapeutic plasma concentrations lignocaine has little effect on atrioventricular (AV) node conduction and His-Purkinje conduction in the normal heart.</p> <p>Elimination is reduced when hepatic blood flow is reduced, as occurs with reduced cardiac output following myocardial infarction.</p>

# Magnesium Sulphate

## CPG D020

<b>Presentation</b>	10mmol (2.47 g in 5 ml amp)
<b>Pharmacology</b>	Intravenous infusion of Magnesium produces a rapid and marked bronchodilation in severe asthma Plays an important role in neurochemical transmission essential for normal function
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Patients with severe asthma not responding to nebulised salbutamol and atrovent</li> <li>2. Torsades de Pointes</li> <li>3. Eclampsia</li> <li>3. Severe pre-eclampsia (consult )</li> </ol>
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Known Hypersensitivity</li> <li>2. Heart Blocks</li> <li>3. Impaired renal or hepatic function</li> <li>4. Addison's Disease</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Dilute and administer as an infusion over 20min.</li> <li>2. Dilute and administer as an infusion over 10mins in Torsade de Pointes</li> <li>3. Pregnancy</li> <li>4. Lactation</li> </ol>
<b>Route of Administration</b>	Intravenous infusion.
<b>Side Effects</b>	<p>Hypotension Circulatory Collapse CNS and Respiratory Depression Cardiac Arrhythmias Loss of deep tendon reflexes</p>
<b>Special Notes</b>	<p>Magnesium must be diluted and administered as an infusion over 20 min for eclampsia/asthma, over 10 min. for Torsades de Pointes with output and over 1-2 mins for Torsades de Points with no output.</p> <p>Onset: Immediate      Peak: 30sec.      Duration: 30min.</p>

# Methoxyflurane

## CPG D021

<b>Presentation</b>	3 ml glass bottle with plastic seal
<b>Pharmacology</b>	Inhalational analgesic agent at low concentrations Central nervous system depressant
<b>Metabolism</b>	Excreted mainly by the lungs. By the liver
<b>Primary Emergency Indication</b>	Pre-hospital pain relief where narcotics are contraindicated or not appropriate
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Pre-existing renal disease / renal impairment</li> <li>2. Concurrent use of tetracycline antibiotics</li> <li>3. Exceeding a total dose of 6ml in a 24 hr period</li> <li>4. Exceeding a total dose of 15ml in any seven day period</li> <li>5. Family history of anaesthetic induced malignant Hyperthermia</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. The "Penthrox"™ inhaler must be hand-held by the patient 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</li> <li>2. Pre-eclampsia</li> </ol>
<b>Route of Administration</b>	Self-administration under supervision using the hand held "Penthrox"™ Inhaler.
<b>Side Effects</b>	<p>Drowsiness</p> <p>Decrease in blood pressure and bradycardia (rare)</p> <p>Exceeding the maximum total dose of 6ml in a 24 hr period, or 15ml in a seven day period may lead to renal toxicity</p>

### Special Notes

The maximum initial priming dose for Methoxyflurane is 3ml. This will provide approximately 25 min of analgesia and may be followed by one further 3ml dose if required once the initial dose has expired. Analgesia commences after 8-10 breaths and lasts for approximately 3-5 min once discontinued.

Methoxyflurane should not be administered in confined spaces (eg. In road and air ambulances) unless the 'Pentrox Analgiser' is fitted with a scavenging system.

Methoxyflurane should not be used on consecutive days.



# Metoclopramide

## CPG D022

<b>Presentation</b>	10mg in 2ml amp
<b>Pharmacology</b>	Antiemetic which accelerates gastric emptying and peristalsis
<b>Metabolism</b>	By the liver and excreted by the kidneys
<b>Primary Emergency Indication</b>	Nausea/vomiting associated with <ul style="list-style-type: none"> <li>- Narcotic pain relief</li> <li>- Past Hx of migraine</li> </ul>
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. GIT haemorrhage, obstruction or perforation</li> <li>2. Known sensitivity or intolerance</li> <li>3. &lt; 16 years of age.</li> </ol>
<b>Precautions</b>	Undiagnosed abdominal pain
<b>Route of Administration</b>	Intravenous ( <i>administer over 1 - 2 mins</i> ) Intramuscular
<b>Side Effects</b>	Drowsiness Lethargy Dry mouth Muscle tremor Hypotension / hypertension Extrapyramidal reactions (usually the dystonic type) Lowers seizure threshold
<b>Special Notes</b>	Not effective for established motion sickness <i>Intravenous effects:</i> Onset: 1 – 3min Duration: 10 – 30min <i>Intramuscular effects:</i> 10 – 15min 1 – 2 hrs



# Midazolam

# CPG D023

<b>Presentation</b>	5mg in 1ml amp
<b>Pharmacology</b>	<p>Short acting central nervous system depressant.</p> <p><i>Actions:</i></p> <ul style="list-style-type: none"> <li>- Anxiolytic – reduces anxiety</li> <li>- Sedative</li> <li>- Anti-convulsant</li> </ul>
<b>Metabolism</b>	In the liver - excreted by the kidneys
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Continuous/recurrent seizures</li> <li>2. Sedation to maintain intubation</li> <li>3. Sedation to enable synchronized cardioversion</li> <li>4. Sedation in the agitated Pt</li> <li>5. Sedation in psychostimulant overdose</li> <li>6. Severe Trauma Multiple Fractures or Severe Burns</li> </ol>
<b>Contraindications</b>	Known hypersensitivity to benzodiazepines
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Reduced doses may be required for the elderly, chronic renal failure, congestive cardiac failure or shock</li> <li>2. The CNS depressant effects of benzodiazepines are enhanced in the presence of narcotics and other tranquillisers including alcohol</li> <li>3. Can cause severe respiratory depression in Pts with COPD</li> <li>4. Pts with myasthenia gravis</li> </ol>
<b>Route of Administration</b>	<p>Intramuscular</p> <p>Intravenous</p>

Side Effects	Depressed level of consciousness Respiratory depression Loss of airway control Hypotension
Special Notes	<i>Intramuscular effects:</i> Onset: 3 – 5min Peak: 15min Duration: 30min <i>Intravenous effects:</i> Onset: 1 – 3min Peak: 10min Duration: 20min

Presentation	10mg in 1ml amp
Pharmacology	<p>A narcotic analgesic</p> <p><i>Actions:</i></p> <p><i>Central Nervous System effects:</i></p> <ul style="list-style-type: none"><li>- Depression - leading to analgesia</li><li>- Respiratory depression</li><li>- Depression of cough reflex</li><li>- Stimulation - changes of mood, euphoria or dysphoria, vomiting, pin-point pupils</li><li>- Dependence (addiction)</li></ul> <p><i>Cardiovascular effects:</i></p> <ul style="list-style-type: none"><li>- Vasodilatation</li><li>- Decreased conduction velocity through the A.V. Node</li></ul>
Metabolism	By the liver and excreted by the kidneys
Primary Emergency Indication	<ul style="list-style-type: none"><li>1. Pain Relief</li><li>2. Sedation to maintain intubation</li></ul>
Contraindications	<ul style="list-style-type: none"><li>1. Known hypersensitivity</li><li>2. Labour</li></ul>
Precautions	<div><ul style="list-style-type: none"><li>1. Elderly</li><li>2. Hypotension</li><li>3. Respiratory depression</li><li>4. Current asthma</li><li>5. Respiratory tract burns</li></ul><ul style="list-style-type: none"><li>6. Known addiction to narcotics</li><li>7. Acute alcoholism</li><li>8. Pts on monoamine oxidase inhibitors</li></ul></div>

Route of Administration	Intravenous Intramuscular																
Side Effects	<p><i>Central Nervous System effects:</i></p> <ul style="list-style-type: none"><li>- Drowsiness</li><li>- Respiratory depression</li><li>- Euphoria</li><li>- Nausea, vomiting</li><li>- Pin-point pupils</li><li>- Addiction</li></ul> <p><i>Cardiovascular effects:</i></p> <ul style="list-style-type: none"><li>- Hypotension</li><li>- Bradycardia</li></ul>																
Special Notes	<p>Morphine Sulphate is a Schedule 8 drug under the Poisons Act and its use must be carefully controlled with accountability and responsibility.</p> <p>Side effects of Morphine Sulphate can be reversed with Naloxone Hydrochloride.</p> <p>Occasional weals are seen in the line of the vein being used for IV injection. This is not an allergy, only a histamine release.</p> <table><tr><td colspan="2"><i>Intravenous effects:</i></td><td colspan="2"><i>Intramuscular effects:</i></td></tr><tr><td>Onset:</td><td>2 – 5min</td><td>Onset:</td><td>10 – 30min</td></tr><tr><td>Peak:</td><td>10min</td><td>Peak:</td><td>30 – 60min</td></tr><tr><td>Duration:</td><td>1 – 2hr</td><td>Duration:</td><td>1 – 2hrs</td></tr></table>	<i>Intravenous effects:</i>		<i>Intramuscular effects:</i>		Onset:	2 – 5min	Onset:	10 – 30min	Peak:	10min	Peak:	30 – 60min	Duration:	1 – 2hr	Duration:	1 – 2hrs
<i>Intravenous effects:</i>		<i>Intramuscular effects:</i>															
Onset:	2 – 5min	Onset:	10 – 30min														
Peak:	10min	Peak:	30 – 60min														
Duration:	1 – 2hr	Duration:	1 – 2hrs														

# Naloxone

# CPG D025

<b>Presentation</b>	0.4mg in 1ml amp
<b>Pharmacology</b>	A narcotic antagonist <i>Action:</i> - Prevents or reverses the effects of narcotics
<b>Metabolism</b>	By the liver
<b>Primary Emergency Indication</b>	Altered Conscious State and respiratory depression secondary to administration of narcotics or related drugs
<b>Contraindications</b>	Nil for this indication.
<b>Precautions</b>	1. If Pt is physically dependent on narcotics, they may become combative after administration. 2. Neonates.
<b>Route of Administration</b>	Intramuscular Intravenous
<b>Side Effects</b>	Symptoms of narcotic withdrawal: Sweating, goose flesh, tremor Nausea and vomiting Agitation Dilatation of pupils, excessive lacrimation Convulsions

Special Notes

Since the duration of action for Naloxone Hydrochloride is often less than that of a narcotic, repeated doses may be required.

Naloxone Hydrochloride reverses the effects of narcotics with none of the actions that other narcotic antagonists produce when there is no narcotic is present in the body. (For example, it does not depress respiration or cause pupillary constriction).

In the absence of narcotics, Naloxone Hydrochloride has no perceivable effect.

Following a narcotic associated cardiac arrest Naloxone Hydrochloride should not be administered. Maintain assisted ventilation.

Following head injury Naloxone Hydrochloride should not be administered. Maintain assisted ventilation if required.

In neonates if the mother has had a narcotic analgesic within one hr. prior to delivery, the baby may have narcotic related respiratory depression for which diluted Naloxone Hydrochloride may be advised on consultation.

*Intravenous effects:*

Onset: 1 – 3min  
Peak:  
Duration: 30 – 45min

*Intramuscular effects:*

Onset: 1 – 3min  
Peak:  
Duration: 30 – 45min



# Normal Saline

# CPG D026

<b>Presentation</b>	10ml polyamp, 500ml + 1000ml infusion soft pack						
<b>Pharmacology</b>	<p>An isotonic crystalloid solution</p> <p><i>Composition:</i></p> <ul style="list-style-type: none"> <li>- Electrolytes - sodium and chloride in a similar concentration to that of extracellular fluid</li> <li>- Water</li> </ul> <p><i>Action:</i></p> <ul style="list-style-type: none"> <li>- A transient increase in the volume of the intravascular compartment</li> </ul>						
<b>Metabolism</b>	<table> <tr> <td><i>Electrolytes:</i></td><td><i>Water:</i></td></tr> <tr> <td>- Excreted by the kidneys</td><td>- Excreted by the kidneys</td></tr> <tr> <td></td><td>- Distributed throughout total body water, mainly in the extracellular fluid compartment</td></tr> </table>	<i>Electrolytes:</i>	<i>Water:</i>	- Excreted by the kidneys	- Excreted by the kidneys		- Distributed throughout total body water, mainly in the extracellular fluid compartment
<i>Electrolytes:</i>	<i>Water:</i>						
- Excreted by the kidneys	- Excreted by the kidneys						
	- Distributed throughout total body water, mainly in the extracellular fluid compartment						
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Intravenous fluid for fluid maintenance</li> <li>2. Irrigation of burns/eyes/wounds</li> <li>3. To keep the vein open (T.K.V.O.)</li> <li>4. To ensure patency during administration of Glucose 10%</li> <li>5. Cardiac arrest</li> <li>6. Dilution of drugs</li> </ol>						
<b>Contraindications</b>	Nil of significance in the above indication						
<b>Precautions</b>	Nil of significance in the above indication						
<b>Route of Administration</b>	Intravenous						
<b>Side Effects</b>	Nil of significance in the above indication						
<b>Special Notes</b>	<i>Intravascular half life:</i> Approximately 30 – 60 min						



<b>Presentation</b>	4mg in 2 ml amp
<b>Pharmacology</b>	Ondansetron is a Serotonin 5-HT <sub>3</sub> receptor antagonist. Its effects are on both central and peripheral nerves. Ondansetron reduces the activity of the vagus nerve, therefore inhibits the vomiting centre in the medulla oblongata, and also blocks serotonin receptors in the chemoreceptor trigger zone.
<b>Metabolism</b>	By the liver, excreted by the kidneys
<b>Primary Emergency Indication</b>	<p>Nausea and vomiting associated with:</p> <ul style="list-style-type: none"> <li>- Cardiac chest pain</li> <li>- Secondary to cytotoxic drugs or radiotherapy</li> <li>- Severe gastroenteritis</li> <li>- Previously diagnosed migraine</li> </ul> <p>Prophylaxis use</p> <ul style="list-style-type: none"> <li>- Motion sickness</li> <li>- Planned aeromedical evacuation</li> <li>- Suspected spinal injury</li> <li>- Eye trauma</li> </ul>
<b>Contraindications</b>	<ol style="list-style-type: none"> <li>1. Known hypersensitivity</li> <li>2. Children &lt; 2 yo</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Impaired hepatic function</li> <li>2. Elderly</li> <li>3. Pregnancy</li> <li>4. Lactation</li> </ol>
<b>Route of Administration</b>	IV / IM
<b>Side Effects</b>	<p>Headache</p> <p>Skin flushing</p> <p>Extra pyramidal effects</p> <p>Arrhythmia</p>

Special Notes

Ondansetron ampoule should be protected from light and should not be removed from packaging until use.

Ondansetron may be given in conjunction with, or independent of, metoclopramide administration.

*Intravenous effects:*

Onset: 2min

Peak: 20min

Duration: 2hrs

# Oxygen

## CPG D029

<b>Presentation</b>	High pressure “Medical Oxygen” - “C” size cylinders 440 litres - “D” size cylinders 1500 litres
<b>Pharmacology</b>	A chemical element that is essential to tissues for sustaining life. It is necessary for the production of cellular energy.
<b>Metabolism</b>	N/A
<b>Primary Emergency Indication</b>	1. Treatment of hypoxaemia / hypoxia 2. To assist organ perfusion in patients with poor perfusion
<b>Contraindications</b>	1. Known paraquat poisoning 2. Lung disease secondary to bleomycin therapy
<b>Precautions</b>	1. Prolonged administration to premature neonates 2. High concentrations given to COPD patients 3. Fire and / or Explosive hazard
<b>Route of Administration</b>	Inhalation via: - Nasal cannula - Non-rebreathing therapy mask - Bag-valve-mask - Endotracheal tube - LMA / ILMA
<b>Side Effects</b>	Hypoventilation in some COPD patients with hypoxic drive Drying of the mucous membranes of the airways
<b>Special Notes</b>	In acutely hypoxic patients supplemental oxygen must take precedence over the concern that in rare circumstances a patient’s hypoxic drive may be lost if high concentrations of oxygen are given.  For COPD, oxygen therapy should be guided by pulse oximetry aiming to maintain SpO <sub>2</sub> readings of between 88% and 92%.

# Paracetamol

## CPG D030

<b>Presentation</b>	Paracetamol 500mg 120 mg in 5ml oral liquid (24mg/ml)
<b>Pharmacology</b>	An analgesic and antipyretic agent  Actions: - Exact mechanism of action unclear; though to inhibit prostaglandin synthesis in the CNS
<b>Metabolism</b>	By the liver; excreted by the kidneys
<b>Primary Emergency Indication</b>	Mild Pain
<b>Contraindication</b>	<ol style="list-style-type: none"> <li>1. Known Hypersensitivity</li> <li>2. Children &lt; 1 month of age</li> <li>3. Paracetamol already administered within past 4hours</li> <li>4. Total paracetamol intake within past 24hours exceeds 4g (adult) or 60mg/kg (children)</li> <li>5. Chest pain in suspected acute coronary syndrome</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Hepatic or renal dysfunction</li> <li>2. Elderly / frail</li> <li>3. Malnourished</li> </ol>
<b>Route of Administration</b>	Oral

Side Effects	<div>1. Hypersensitivity reactions including severe skin rashes (rare)</div> <div>2. Haematological reactions (rare)</div>
Special Notes	<div>There are several brands of Paracetamol available in Australia. Paracetamol is also found in many combined medicines, both perscription and over-the counter.</div> <div>Carefully determine previous paracetamol intake before dose administration.</div> <div>The usual dose of Paracetamol for children is 15mg/kg per dose. The maximum total dose of 60mg/kg therefore equates to 4 doses within a 24hours period.</div> <div>Hepatic damage is very rare when Paracetamol is taken at recommended dosages.</div> <div>Paracetamol is not indicated for the treatment of fever in the emergency setting.</div> <div>Onset: 30 minutes</div> <div>Peak:</div> <div>Duration: 4 hours</div>

# Prochlorperazine

## CPG D031

<b>Presentation</b>	12.5mg in 1ml amp
<b>Pharmacology</b>	An anti-emetic <i>Action:</i> - Acts on several central neuro-transmitter systems
<b>Metabolism</b>	Metabolised by the liver and excreted by the kidneys
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Treatment or prophylaxis of nausea/vomiting for <ul style="list-style-type: none"> <li>- Motion sickness</li> <li>- Penetrating eye injury</li> <li>- Planned aeromedical evacuation</li> </ul> </li> <li>2. Vertigo or nausea or vomiting associated with migraine, labyrinthitis or Meniere's syndrome</li> <li>3. Known allergy or contraindication to Metoclopramide administration</li> </ol>
<b>Contraindications</b>	<ol style="list-style-type: none"> <li>1. Circulatory collapse</li> <li>2. CNS depression</li> <li>3. Previous hypersensitivity</li> <li>4. Children &lt; 2 years of age</li> </ol>
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Hypotension</li> <li>2. Epilepsy</li> <li>3. Pts effected by alcohol or on anti-depressants</li> </ol>
<b>Route of Administration</b>	Intramuscular

# Prochlorperazine

**CPG D031**

<b>Side Effects</b>	<p>Drowsiness Blurred vision Hypotension Sinus tachycardia Skin rash Extrapyramidal reactions, usually the dystonic type</p>
<b>Special Notes</b>	<p>Tardive dyskinesia may develop in patients on antipsychotic drugs. The disorder consists of repetitive involuntary movements of the tongue, face, mouth or jaw. It has been reported that fine vermicular movements of the tongue may be an early sign of the syndrome.</p> <p><i>Intramuscular Effect</i></p> <p>Onset: 20min Peak: 40min Duration: 6hrs</p>

# Salbutamol

## CPG D032

<b>Presentation</b>	5mg in 2.5ml nebule/polyamp 500mcg in 1ml amp 100mcg in 5ml pMDI
<b>Pharmacology</b>	A synthetic Beta-adrenergic stimulant, with primarily Beta 2 effects <i>Action:</i> - Causes bronchodilatation
<b>Metabolism</b>	By the liver and excreted by the kidneys
<b>Primary Emergency Indication</b>	Respiratory distress with suspected bronchospasm: - asthma - severe allergic reactions - COPD - smoke inhalation
<b>Contraindications</b>	Nil of significance in the above indications
<b>Precautions</b>	1. Diabetes Mellitus 2. Cardiac disease 3. Pregnancy/lactating mothers 4. Between doses, oxygen must be administered continuously 5. Large doses of IV Salbutamol have been reported to cause intracellular metabolic acidosis
<b>Route of Administration</b>	Nebulised Intravenous Pressurised Metered Dose Inhaler (pMDI)



<b>Side Effects</b>	<p>Sinus tachycardia</p> <p>Muscle tremor (common)</p>
<b>Special Notes</b>	<p>Tolerance to the bronchodilator effect may occur with prolonged or excessive use.</p> <p>Diabetes Mellitus is a precaution due to Salbutamol's Beta 1 and Beta 2 effect that has been reported to have caused cases of hyperinsulinaemia and hyperglycaemia.</p> <p>Administration with pregnancy is a precaution due to there being no conclusive evidence of effects upon the foetus.</p> <p>Salbutamol administration with patients with a history of cardiac disease can lead to tachyarrhythmias and hypertension due to its Beta 1 and Beta 2 effects or by producing hypokalaemia.</p> <p>IV Salbutamol has no advantage over nebulised Salbutamol provided that adequate ventilation is occurring.</p> <p>Salbutamol Nebules/Polyamps should remain in the packaging after the wrapping is opened. The date of opening of the packaging should be recorded and the drug should be stored in an environment of &lt; 30 °C.</p> <p>Salbutamol by intravenous infusion may be required during interhospital transfers of some women in premature labour. The dose is to be prescribed and signed by the referring hospital medical officer.</p> <p><i>Nebulised effects:</i></p> <p>Onset: 5 – 15min</p> <p>Peak:</p> <p>Duration: 15 – 50min</p> <p><i>Intravenous effects:</i></p> <p>Onset: 1 – 2min</p> <p>Peak:</p> <p>Duration: 30 – 60min</p>

# Sodium Bicarbonate 8.4%

## CPG D033

<b>Presentation</b>	50ml prepared syringe (Sodium Bicarbonate 8.4%)
<b>Pharmacology</b>	<p>A hypertonic crystalloid solution</p> <p><i>Composition:</i></p> <ul style="list-style-type: none"> <li>- Contains sodium and bicarbonate ions in a solution of high pH</li> </ul> <p><i>Action:</i></p> <ul style="list-style-type: none"> <li>- Raises pH</li> </ul>
<b>Metabolism</b>	<p>Sodium: excreted by the kidneys</p> <p>Bicarbonate: excreted by the kidneys as bicarbonate ion, and by the lungs as carbon dioxide</p>
<b>Primary Emergency Indication</b>	<ol style="list-style-type: none"> <li>1. Symptomatic Tricyclic Antidepressant (TCA) overdose or hyperkalaemia</li> <li>2. Crush Syndrome with evidence of hyperkalaemia</li> <li>3. Cardiac arrest with suspected hyperkalaemia or TCA overdose</li> </ol>
<b>Contraindications</b>	Nil of significance in the above indication
<b>Precautions</b>	<ol style="list-style-type: none"> <li>1. Administration of Sodium Bicarbonate 8.4% must be accompanied by effective ventilation and External Cardiac Compression if required</li> <li>2. Since Sodium Bicarbonate 8.4% causes tissue necrosis, care must be taken to avoid leakage of the drug into the tissues</li> <li>3. Because of the high pH of this solution do not mix or flush any other drug or solution with Sodium Bicarbonate 8.4%</li> </ol>
<b>Route of Administration</b>	Intravenous

# Sodium Bicarbonate 8.4%

**CPG D033**

<b>Side Effects</b>	<p>Sodium overload may provoke pulmonary oedema</p> <p>Excessive dosage of Sodium Bicarbonate 8.4%, especially without adequate ventilation and circulation may cause an intracellular acidosis.</p>
<b>Special Notes</b>	<p>Dilute to 4.2% for Neonates</p> <p><i>Intravenous effects:</i></p> <p>Onset: 1 – 2min</p> <p>Peak:</p> <p>Duration: Depends on cause and Pt's perfusion</p>



# Water for Injection

**CPG D034**

<b>Presentation</b>	10ml in amp/polyamp
<b>Pharmacology</b>	Water for Injections is a clear, colourless, particle free, odourless and tasteless liquid. It is sterile, with a pH of 5.6 to 7.7 and contains no antimicrobial agents
<b>Metabolism</b>	Distributed throughout the body and excreted by the kidneys
<b>Primary Emergency Indication</b>	Used to dissolve Ceftriaxone in preparation for intravenous injection
<b>Contraindications</b>	Nil in the above indication
<b>Precautions</b>	Nil in the above indication
<b>Route of Administration</b>	Intravenous
<b>Side Effects</b>	Nil
<b>Special Notes</b>	Nil









## Authority to Practice Matrix

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- Not all Ambulance Paramedics and Intensive Care Paramedics are authorised to practice at the levels defined within this matrix
- Clinicians are responsible for ensuring they operate within their individually approved scope of practice
- Student Paramedic and Student Intensive Care Paramedics will be progressively authorised by the Director of Ambulance Services to practice under either direct or indirect supervision in accordance with Clinical Practice Guidelines as they progress through their academic programs
- Ambulance Tasmania may alter Authority to Practice Skills and Pharmacology Matrix at any time based on best evidence, patient safety and operational requirements



## Ambulance Paramedic

12-lead interpretations  
Application of aseptic dressing  
BVM Ventilation  
Cardiac Monitoring  
Cardio Pulmonary Resuscitation  
Defibrillation  
Glucometry  
Intramuscular Injections  
Intravenous Injections  
Intranasal drug administration\*  
Laryngeal mask airway insertion  
Nasopharyngeal airway  
Nebulised Medications  
Oropharyngeal airway  
Use of cervical collar  
Use of pelvic binder\*  
Use of spinal immobilisation techniques  
Use of traction splints  
Valsalva

## Intensive Care Paramedic

12-lead interpretations  
Chest Decompression  
CPAP\*  
Endotracheal intubation  
External Jugular venous cannulation  
Insertion of naso/orogastric tube\*  
Intraosseous access  
Intravenous infusions\*  
Synchronised cardioversion  
Transcutaneous cardiac pacing\*

\* On completion of AT approved training

## Ambulance Tasmania Scope of Practice Levels - Adult

CPG (Adults)	Ambulance Paramedic	Intensive Care Paramedic
A0201 Cardiac Arrest	Normal Saline Adrenaline	Normal Saline Adrenaline Amiodarone
A0302 Endotracheal Intubation		Morphine Midazolam Fentanyl
A0401 Acute Coronary Syndrome	Glyceryl Trinitrate (GTN) Aspirin	Glyceryl Trinitrate (GTN) Aspirin
A0402 Bradycardia		Atropine Adrenaline Infusion Adrenaline IV
A0403 Tachyarrhythmias inc. (SVT & VT)		Adenosine Amiodarone Infusion Amiodarone IV Midazolam
A0405 Accelerated Idioventricular Rhythm (AIVR)		Normal Saline
A0406 Pulmonary Oedema	Glyceryl Trinitrate (GTN)	Glyceryl Trinitrate (GTN) Glyceryl Trinitrate (GTN) IV Frusemide
A0407 Inadequate Perfusion (Cardiogenic Causes)		Normal Saline Adrenaline Infusion Adrenaline IV

## Ambulance Tasmania Scope of Practice Levels - Adult

CPG (Adults)	Ambulance Paramedic	Intensive Care Paramedic
<b>A0501</b> Pain Relief	Fentanyl IM/ IN / IV Methoxyflurane Morphine IM / SC / IV	Fentanyl IM / IN / IV / IO Methoxyflurane Morphine IM / SC / IV / IO Midazolam Ketamine IM / IV / IO
<b>A0601</b> Acute Bronchoconstriction (Asthma, COPD)	Salbutamol pMDI, neb Ipratropium Bromide Adrenaline IM	Salbutamol pMDI, neb, IV Ipratropium Bromide Magnesium Dexamethasone Adrenaline IM, IV, IO Normal Saline
<b>A0701</b> Nausea and Vomiting	Metoclopramide Prochlorperazine Ondansetron IV/IM	Metoclopramide Prochlorperazine Ondansetron IV/IM
<b>A0702</b> Glycaemic Emergencies	Glucose Paste Oral Glucose IV Glucagon IM	Glucose Paste Oral Glucose IV Glucagon IM
<b>A0703</b> Continuous or Recurrent Seizures	Midazolam IM	Midazolam IM, IV

## Ambulance Tasmania Scope of Practice Levels - Adult

CPG (Adults)	Ambulance Paramedic	Intensive Care Paramedic
A0704 Anaphylaxis	Adrenaline IM	Adrenaline IM, IV, ETT, Neb Adrenaline Infusion Dexamethasone
A0705 Inadequate Perfusion (Non-cardiogenic / Non-hypovolaemic)	Normal Saline	Normal Saline Adrenaline Infusion Adrenaline IV
A0706 Meningococcal Septicaemia	Ceftriaxone Lignocaine IM	Ceftriaxone Lignocaine IM
A0707 Management of Overdose	Naloxone	Naloxone Sodium Bicarbonate
A0708 Agitated Patient	Midazolam IM	Midazolam IM, IV
A0709 Organophosphate Poisoning		Atropine
A0710 Autonomic Dysreflexia	Glyceryl Trinitrate (GTN)	Glyceryl Trinitrate (GTN)
A0801 Inadequate Perfusion Associated with Hypovolaemia	Normal Saline	Normal Saline
A0805 Burns	Normal Saline	Normal Saline
A0807 Crush Syndrome	Normal Saline	Normal Saline Sodium Bicarbonate

Ambulance Tasmania Scope of Practice Levels - Adult

CPG (Adults)	Ambulance Paramedic	Intensive Care Paramedic
A0808 Diving Emergency	Normal Saline	Normal Saline
A0901 Hypothermia / Cold Exposure	Normal Saline	Normal Saline Adrenaline Amiodarone
A0903 Post Partum Haemorrhage		Ergometrine
A0904 Eclampsia		Magnesium Sulphate Infusion

# Authority to Practice Matrix - Pharmacology (Paed.)

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Ambulance Tasmania Scope of Practice Levels - Paediatrics

CPG (Paediatrics)	Ambulance Paramedic	Intensive Care Paramedic
P0201 Cardiac Arrest		Normal Saline Adrenaline Amiodarone
P0302 Endotracheal Intubation		Morphine Midazolam
P0402 Bradycardia		Normal Saline Adrenaline IV
P0403 Tachyarrhythmias		Adenosine Midazolam
P0501 Pain Relief	Fentanyl IN Methoxyflurane	Fentanyl IN Methoxyflurane Morphine
P0601 Upper Airway Obstruction	Adrenaline Neb	Adrenaline Neb Dexamethasone IV, IM
P0602 Asthma	Salbutamol pMDI, Neb Ipratropium Bromide Adrenaline IM	Salbutamol pMDI, Neb Ipratropium Bromide Magnesium Infusion Dexamethasone Adrenaline IM, IV Normal Saline
P0701 Nausea and Vomiting		Ondansetron IM, IV



# Authority to Practice Matrix - Pharmacology (Paed.)

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Ambulance Tasmania Scope of Practice Levels - Paediatrics

CPG (Paediatrics)	Ambulance Paramedic	Intensive Care Paramedic
<b>P0702</b> Glycaemic Emergencies	Glucose Paste Oral Glucose IV Glucagon IM Normal Saline	Glucose Paste Oral Glucose IV Glucagon IM Normal Saline
<b>P0703</b> Continuous or Recurrent Seizures	Midazolam IM	Midazolam IM, IV
<b>P704</b> Anaphylaxis	Adrenaline IM	Adrenaline IM, IV, Neb Dexamethasone
<b>P0706</b> Meningococcal Septicaemia	<b>Ceftriaxone IM</b> <b>Lignocaine IM</b>	Ceftriaxone IM, IV Lignocaine IM
<b>P0707</b> Management of Overdose	Naloxone IM	Naloxone IM, IV Sodium Bicarbonate IV
<b>P0709</b> Organophosphate Poisoning		Atropine
<b>P0801</b> Inadequate Perfusion Associated with Hypovolaemia	Normal Saline	Normal Saline
<b>P0803</b> Burns	Normal Saline	Normal Saline
<b>P0901</b> Hypothermia / Cold Exposure		Normal Saline Adrenaline Amiodarone