

Ambulance Victoria

Remote Area Nurses Emergency Guidelines

2019



Remote Area Nurses

Emergency Guidelines

2019

Disclaimer

These Remote Area Nurses Emergency Guidelines (RANEG) have been prepared by Ambulance Victoria (AV) with the assistance of Bush Nursing Centre (BNC) representatives.

These RANEGs are intended solely for use by Victorian Remote Area Nurses (RANs) employed in a BNC who have completed annual competency-based skills training for the provision of first line emergency care in the event of a medical or trauma emergency.

The content in these RANEGs is for information purposes only and is not intended to be relied on as a substitute for the provision of medical advice or treatment. The information is intended to be a supplement to the annual competency-based skills training provided to RANs.

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Note: These RANEGs have been developed to assist registered nurses employed as RANs by the following Victorian BNCs:

Balmoral
Buchan
Cann Valley
Dargo
Dartmoor
Dingee
Elmhurst
Ensay
Gelantipy
Harrow
Lake Bolac
Lockington
Swifts Creek
Walwa
Woomelang

Remote Area Nurses Emergency Guidelines 2019
Revised Edition
January 2019

Ambulance Victoria

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Ambulance Victoria
375 Manningham Road
Doncaster, Victoria 3108

PO Box 2000
Doncaster, Victoria 3108

Introduction

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Bush nursing centres & registered nurses employed as remote area nurses

Bush nursing centres (BNCs) are small non-bed-based primary health services that provide small rural and remote communities access to essential primary health and nursing services.

BNCs are Incorporated Associations with their own boards of management. In providing health services, BNCs have accountability for the corporate, fiscal and clinical standards and outcomes of their organisation and the staff they employ.

In the course of their employment, registered nurses (division 1), employed in Victorian BNCs as remote area nurses (RANs), may provide emergency care (including administration of drugs) to patients when no medical practitioners are available.

In Victoria the term RAN specifically refers to a Registered Nurse who:

- is employed by a BNC
- has completed annual training in the provision of first line emergency care in the event of a medical or trauma emergency and demonstrated competence in accordance with the training and Remote Area Nurses Emergency Guidelines (RANEG)
- is authorised by their employer to practice in accordance with the RANEG.

The title of RAN in Victoria is an employment title and is not a protected title under the Health Practitioner Regulation National Law.

Administration of medicines:

In Victoria the supply and management of medicines by health professionals is governed by the *Drugs, Poisons and Controlled Substances (DPCS) Act 1981* and the *Drugs, Poisons and Controlled Substances Regulations 2006* and it is an offence to possess Schedule 4 or Schedule 8 poisons unless authorised under the Act or the Regulations. In the course of their normal duties, registered nurses are authorised (under Regulation 5(2)) to possess Schedule 4 or Schedule 8 poisons that are necessary for administration to patients under their care, in accordance with:

- the instructions and authorisation of a medical practitioner for a specific patient/client
- the conditions of a Department of Health and Human Services health services permit (HSP), or
- the approval of the departmental Secretary in specified circumstances, such as immunisation services by accredited nurse immunisers.

An HSP is issued to an establishment (such as hospital) to authorise it to possess Schedule 4 and Schedule 8 poisons for the provision of health services. In the case of BNCs, the permit also allows that:

- in an emergency where contact with a medical practitioner is not practical, a RAN may administer a Schedule 4 poison or a Schedule 8 poison, if during the previous 12 months the RAN has demonstrated competence in physical assessment skills relevant to the condition for which the Schedule 4 or Schedule 8 poison is administered

- if a medical practitioner has not been contacted, the RAN will keep records of the circumstances of such administration; and the rationale for this treatment.

The BNC HSP extends only to the administration of the specified Schedule 4 and Schedule 8 medicines without a medical practitioner's order. Initiation of Schedule 2 and Schedule 3 medicines is a matter of local employer-based policy rather than DPCS regulation. By authorising a RAN to act in accordance with the RANEG, BNCs are implying that the initiation (and administration) of those Scheduled 2 and 3 drugs included in the RANEG is approved.

When acting in accordance with the RANEG and administering the specified medications, RANs are 'initiating under protocol' rather than independently prescribing, much as a Registered Nurse in a hospital may be authorised under a 'standing order' (National Nursing & Nursing Education Taskforce 2006).

Further guidance for health professions and employers regarding medicines legislation and regulation can be found at <www.health.vic.gov.au/dpu/reqhealth.htm>.

Introduction

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About the RANEG

The RANEG demonstrates a collaborative approach between Ambulance Victoria and BNC representatives. It is developed specifically for the use of Victorian RANs who have completed the annual competency-based skills training for the provision of first line emergency care in the event of a medical or trauma emergency and have been authorised to practice by their employer. The RANEGs form the foundation for the training.

The RANEG reflects current medical, nursing and pharmacological practice and provides evidence-based guidelines to promote and support safe and effective nursing practice by RANs when providing emergency care and stabilisation treatment in Victoria. In the context of continuous quality improvement each individual RANEG is revised and updated (as a minimum) on a three-year cycle with individual review dates noted for each RANEG.

The RANEG has been developed by the RANEG working group and endorsed by Ambulance Victoria's Medical Advisory Committee. It strongly aligns with the Ambulance Victoria clinical practice guidelines to promote consistent pre hospital emergency care and stabilisation treatment in rural and remote communities.

The RANEG 2019 replaces all previous versions and is valid from 1 July 2019.

Acknowledgments

Members of the RANEG Working Group:

Anne Brewer, Remote Area Nurse, Buchan Bush Nursing Centre

Professor Stephen Bernard, Medical Director, Ambulance Victoria

Mike Ray, Acting Manager - Emergency Co-Responder Programs, Ambulance Victoria

Bruno Bageun, Jennifer Ashmore and Naomi McMaster, Acting Coordinators - Emergency Co-Responder Programs, Ambulance Victoria

Sandi Grieve, Nurse Practitioner Primary Care, Walwa Bush Nursing Centre

Deborah Funcke, Remote Area Nurse, Elmhurst Bush Nursing Centre

Claire McGregor, Remote Area Nurse, Dingee Bush Nursing Centre

Dr Paul Jennings, MICA Paramedic / Regional Clinical Manager, Ambulance Victoria

Pat Standen, Emergency & Critical Care Coordinator, Department of Health and Human Services

The working group would also like to acknowledge and thank the many others who provided assistance and contributed to the review and revision of the RANEGs.

Note: If a health service uses these RANEGs to inform the development of their own clinical guidelines, the onus is on the health service to ensure they fully satisfy all regulatory requirements.

How to use the guidelines

Version: 10 Reviewed: December 2018

These RANEGs have been developed specifically for RANs employed by Victorian BNCs who have successfully completed the annual competency-based RAN emergency care update program. They cannot be used as an 'authority to practice'.

The RANEGs are in five parts:

Part A - Criteria for assessment includes information on how to use the RANEGs and provides a range of criteria for assessments.

Part B - Resuscitation includes documentation for adult and paediatric cardiac arrest.

Part C - Patient management and assessment includes common emergency presentations. Each presentation has a flowchart for action.

Part D - Supportive information includes documentation on a range of medical conditions, technical procedures, equipment and specific incidents.

Part E - Information on drugs and therapeutic agents.

Part F - Further information includes abbreviations, mnemonics, glossary, references and a resource list including phone numbers and useful websites.

Using the assessments

All assessments begin with a systematic clinical approach and the management of immediate life threats (DRABCD). All situations covered by these RANEGs require the RAN to notify ambulance and to consult a doctor. If a doctor is not available, the RANEGs provide a framework to proceed.

Due to the relative urgency of first line emergency care and stabilisation, the triage and assessments must be made rapidly. Assessment is usually carried out concurrently with initial treatment.

The majority of the RANEGs relate to both adults and children. When a specific RANEG relates to children under 12 years of age (11 inclusive and under), it is referred to as 'paediatric'.

Using the flowcharts

Each flowchart sets out a series of actions to consider when confronted with a particular emergency. The flowcharts provide one example of an appropriate method of treatment for that presentation. Each flowchart presents with the most critical scenario on the left-hand side of the page.

The flowcharts provide a RANEG for probable treatment, allowing the RAN to prepare the patient for stabilisation or transfer. RANs are not expected to make a medical diagnosis but to assess and recognise symptoms and signs, initiate care and begin stabilisation treatment.

Remember:

Emergencies present without warning. RANs are urged to be familiar with the location, contents and layout of these RANEGs before an emergency occurs.

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Clinical approach

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This structured approach is used to enable the provision of a standard, consistent, logical approach to patient care and constitutes a part of all patient assessment. It incorporates both the primary and secondary survey.

The clinical approach is to be applied to all patients as a basic level of care. There is an assumption in each RANEG that this is the minimum level of care that the patient will receive prior to the application of the RANEG. The exception to this rule is the patient in immediate life threat who requires intervention during the primary survey.

Stop		
	Primary survey/life threat status	
	<ul style="list-style-type: none"> • Standard precautions: gloves, goggles, PPE, mask, vest • Dangers – assess safety and control hazards. Continuous dynamic risk assessment • Response – Yes/No - Trapezius squeeze • Airway – patent (cervical spine immobilisation if required) • Breathing – Assess < 10 secs assist ventilations if tidal volume inadequate • Circulation – commence CPR if required / manage life-threatening haemorrhage • Haemorrhage – control life-threatening haemorrhage • Disability – AVPU: (Alert, Verbal, Pain, Unresponsive) (p 161) • Exposure – Consider potential for hypo/hyperthermia 	Immediate management + Contact doctor and ambulance + Sitrep required - utilise ETHANE mnemonic (p 161)
Action		
	<ul style="list-style-type: none"> • Rapport, rest and reassurance • Posture/position of comfort • Oxygen - Adult - as per Oxygen use in emergency presentations RANEG (p 69) - Paediatric - 5-10 Lpm via simple face mask or 100% via BVM as required • Establish if refusal or limitation of treatment documented 	In order of clinical need If clinically applicable, assess Hx prior to physical contact with patient e.g. VSS, applying monitor, exposing chest
Assess		
	History - AMPLE (p 161)	
	<ul style="list-style-type: none"> • Brief clinical history • Event prior to RAN arrival • Past medical history • Pain – verbal analogue score • Medications • Allergies 	Accurate history + assessment essential for problem recognition

Clinical approach

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Assess		
Vital signs survey		
	<ul style="list-style-type: none"> • GCS (Glasgow Coma Scale) (p 5 & p 12) • PSA (Perfusion Status Assessment) (p 6 & p 13) • RSA (Respiratory Status Assessment) (p 7 & p 14) • Pattern/mechanism of injury/medical condition 	<p>Determine time criticality to Mx accordingly</p> <p>Accurate body system assessment in all patients</p>
Assess		
Assessment tools/secondary survey		
	<ul style="list-style-type: none"> • Secondary survey • SpO₂ • Cardiac monitor/12 lead ECG • Temperature • More detailed history • BGL – Blood Glucose Level 	<p>Thorough physical examination</p> <ul style="list-style-type: none"> - Head to toe - Inspection, palpation, auscultation, percussion
Determine main presenting problem		
	<p>The combination of subjective (PHx, Hx, med's) and objective (physical) data allows identification of clinical problems</p> <p>Multiple problems may be identified and prioritised to provide order of treatment</p> <p>Some overlap in treatment may address multiple problems</p>	<p>Confirm clinical reasoning with assessment data</p>
Action		
	<ul style="list-style-type: none"> • Further sitrep/resource requirements as required • IV access as required • Specific treatment – appropriate RANEG applied to manage clinical problems • Arrange for transport to appropriate facility • Reassess frequently and adapt management as appropriate • Final assessment at handover 	

Time Critical Guidelines (adult)

Version: 6 Reviewed: December 2018

The concept and recognition of the 'time critical' patient allows for appropriate decisions to be made for the management of individual patients and informs triage decisions for patients with major trauma or other time-critical conditions.

The time critical guidelines are used for the assessment, recognition and care of trauma patients and are used by Victorian emergency departments as a guide to dictate patient acuity level, timeframes for treatment and level of response (additional resources) required for the variety of patient presentations in trauma. Judicious time management and early transport to a definitive care facility are seen as part of the treatment plan for all time critical patients.

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

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

An adult patient with a mechanism of injury only under the trauma triage guidelines may be deemed to be time critical if they have either:

- systemic illness limiting normal activity, or
- systemic illness constant threat to life.

Examples of such significant underlying medical conditions are: poorly controlled hypertension, obesity, controlled or uncontrolled Congestive Cardiac Failure, symptomatic COPD, Ischaemic Heart Disease, Chronic Renal Failure or liver disease.

Time critical criteria	
<i>Patients meeting the following are regarded as having, or potentially having, a clinical problem of major significance – they are time critical</i>	
Vital signs (Physiological) Actual Time Critical	See attached flowcharts (p4 & p9)
Medical conditions Emergent Time Critical	Medical symptoms/syndromes <ul style="list-style-type: none"> - acute coronary syndrome - acute stroke - severe sepsis, including suspected Meningococcal disease - possible abdominal aortic aneurysm - undiagnosed severe pain
	Need for possible hyperbaric treatment e.g. acute decompression illness or cyanide poisoning
	Hypothermia or hyperthermia

Trauma Time Critical Guidelines (adult)

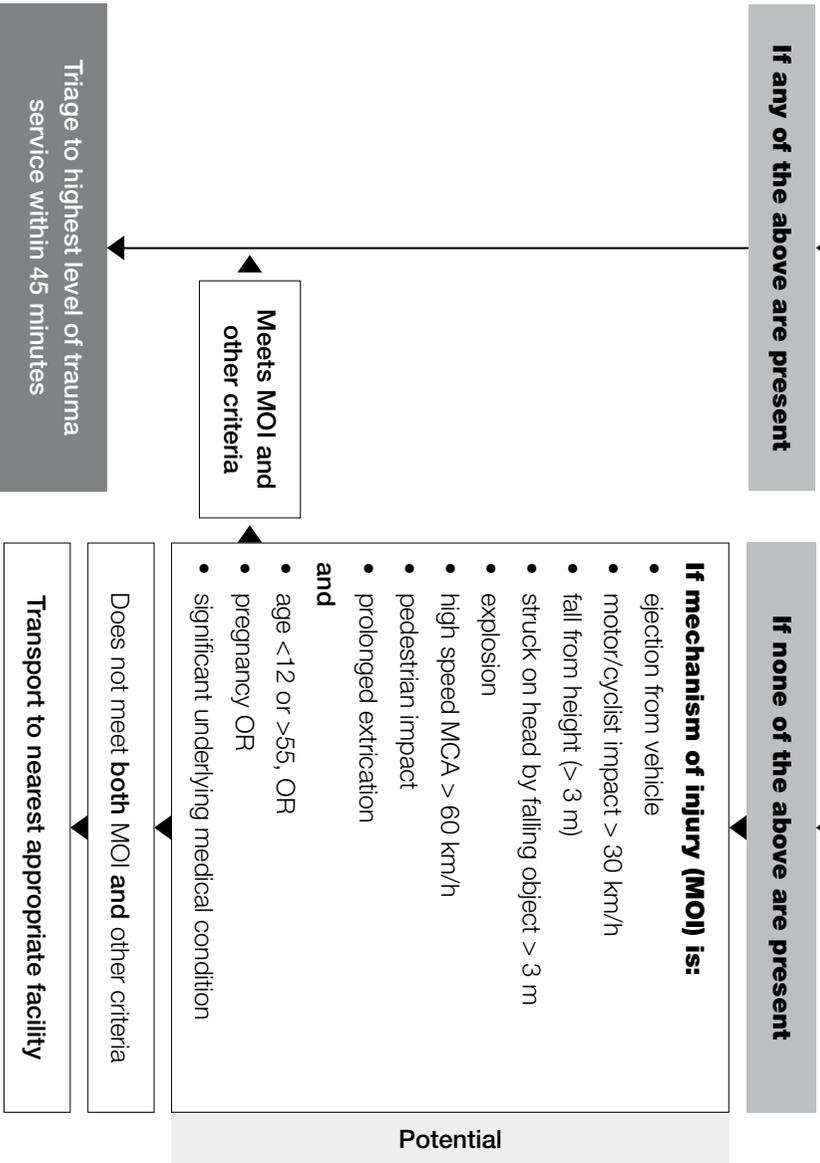
Version: 6 Reviewed: December 2018

Trauma Time Critical Guidelines (adult)

Vital signs (major trauma if any one of the following present)	
• Respiratory rate	<10 or > 30/min
• Systolic BP	< 90 mmHg SBP
• Pulse	< 60 or >120/min
• Conscious state	if ≥ 16 years - GCS < 13 if ≤ 15 years - GCS < 15
• SpO ₂	< 90%

OR

Injuries (major trauma if any one of the following present)	
<ul style="list-style-type: none"> • All penetrating injuries (except isolated superficial limb injuries) • Blunt injuries <ul style="list-style-type: none"> - Serious injury to a single body region such that specialised care or intervention may be required or such that life, limb or long-term quality of life may be at risk - Significant injuries involving more than one body region • Specific injuries <ul style="list-style-type: none"> - Limb amputations / limb threatening injuries - Suspected spinal cord injury or spinal fracture - Burns > 20% TBSA (> 10% if ≤ 15 yrs) or suspected respiratory tract burns - High voltage (>1000 volts) burn injury - Serious crush injury - Major compound fracture or open dislocation - Fracture to two or more of the following: femur/tibia/humerus - Fractured pelvis 	Emergent



Glasgow Coma Scale (GCS) (adult)

Version: 7 Reviewed: December 2018

Best eye opening response

Response	Score	Description
Spontaneous	4	The patient's eyes open when you come to the bedside.
To voice	3	The patient's eyes open to command.
To pain	2	The patient's eyes open on suctioning, starting an IV, drawing blood, trapezius squeeze, finger and nail bed pressure.
None	1	The patient's eyes do not open at all.

Best verbal response

Response	Score	Description
Oriented	5	The patient is alert and oriented (to person, place, and time).
Confused	4	The patient can give their name but is less likely to know address or day of the week. Most patients at this level can name the Prime Minister. Names seem to be retained better than numbers.
Inappropriate words	3	Inconsistent answers; patients can give you their name only occasionally. Profanity is often retained and frequently patients repeat the same word over and over.
Incomprehensible sounds	2	These patients may have deteriorated to the point that intubation should be considered. Intoxicated patients may be at this level.
None	1	No verbal response.

Best motor response

Response	Score	Description
Obeys commands	6	Commands may be complex, as in cranial nerve assessment: 'squeeze my hand'. A positive response from the patient is only meaningful if the second part of the command, 'now let go' is also performed.
Localises pain	5	The patient is able to localise the source of the pain.
Withdraw (pain)	4	The individual knows there is pain but cannot localise it. The whole body withdraws from the pain.
Flexion (pain)	3	Sometimes called decortication, though better termed abnormal flexion. The patient flexes their arms tightly on their chest and extends the lower extremities.
Extension (pain)	2	Sometimes called decerebration, this stereotyped response is better termed abnormal extension. The upper extremities extend and internally rotate, the lower extremities extend on stimulation or as the situation worsens spontaneously.
None	1	No response; the patient is flaccid. Occasionally as the situation worsens, a weak flexor response develops in the lower extremities. This is a spinal reflex and is a grim prognostic sign.

Perfusion Status Assessment (adult)

Version: 5 Reviewed: December 2018

Assess patient using following algorithm

Consider:

- presenting problem
- medication
- trends of observations
- response to interventions.

No perfusion

Skin

- Cool, pale, clammy

HR

- No palpable pulse

SBP

- Unrecordable

Conscious state

- Unconscious

Extremely poor perfusion

Skin

- Cool, pale, clammy

HR

- < 50 or > 110/min

SBP

- < 60 mmHg, or unrecordable

Conscious state

- Altered or unconscious

Inadequate perfusion

Skin

- Cool, pale, clammy

HR

- < 50 or > 100/min

SBP

- 60–80 mmHg

Conscious state

- Alert +/- altered

Borderline perfusion

Skin

- Cool, pale, clammy

HR

- 50–100/min

SBP

- 80–100 mmHg

Conscious state

- Alert and orientated

Adequate perfusion

Skin

- Warm, pink, dry

HR

- 60–100/min

SBP

- > 100 mmHg

Conscious state

- Alert and orientated

Special notes:

- Other factors may affect the interpretation of the observations made, such as - the environment, ambient temperature may affect skin signs, anxiety/pain may affect pulse rate, alcohol and drugs may affect conscious state. Other conditions may affect conscious state observations such as poor cerebral perfusion, respiratory hypoxia, head injuries, hypoglycaemia and drug overdoses.
- Consider the whole patient – there is no single sign that is definitive.

Respiratory Status Assessment (adult)

Version: 4 Reviewed: December 2015

Assess patient using following algorithm

Consider:

- presenting problem
- medication
- trends of observations
- response to interventions.

Symptoms	Severe distress (life-threatening)	Moderate distress	Mild distress	Normal
General appearance	Distressed, anxious, fighting to breathe, exhausted, catatonic	May be distressed or anxious	Calm or mildly anxious	Calm, quiet
Speech	Words only or unable to speak	Short phrases	Full sentences	Clear and steady sentences
Breath sounds and chest auscultation	Unable to cough Asthma: expiratory wheeze +/- inspiratory wheeze; maybe no breath sounds (late) LVF: crackles full field, with possibly a wheeze expiratory +/- inspiratory Upper airway obstruction: Inspiratory stridor	Able to cough Asthma: expiratory wheeze, +/- inspiratory wheeze LVF: crackles at bases – to mid-zone	Able to cough Asthma: mild expiratory wheeze LVF: may be some fine crackles at bases	Able to cough Asthma: usually quiet, no wheeze LVF: no crackles or scattered fine basal crackles, e.g. postural
Respiratory rate	> 20 or < 6–8	> 20	16–20	12–16
Respiratory rhythm	Asthma: prolonged expiratory phase	Asthma: prolonged expiratory phase	Asthma: may be slightly prolonged expiratory phase	Regular even cycles
Breathing effort	Marked chest movement with accessory muscles, inter-costal retraction and/or tracheal tugging	Marked chest movement +/- use of accessory muscles	Slight increase in normal chest movement	Little with small chest movement
Pulse rate	Tachycardia (> 120), bradycardia late sign in severe cases	100–120	60–100	60–100
Skin	Pale and sweaty, +/- cyanosis	May be pale and sweaty	Normal	Normal
Conscious state	Altered or unconscious	May be altered	Alert	Alert

Stroke assessment (adult)

Version: 6 Reviewed: December 2018

1. Introduction

The effectiveness of definitive stroke therapy can be assisted by the accurate assessment of acute stroke. Presently the available acute stroke therapies have only a narrow window of effectiveness.

An abnormal finding to one of these assessment criteria below and the exclusion of any 'stroke mimic' is highly reliable in identifying a stroke.

2. Initial management

- Treat as for clinical approach (p 1).
- Assess for stroke symptoms using stroke assessment tool and record findings.

3. Confirm acute stroke

- Consider and exclude stroke mimics.
- Determine and document the exact time of onset of stroke symptoms.
- If there are no significant comorbidities, notify AV to aid decision making regarding transport to a hospital offering an acute stroke service.
- Continue symptomatic management.

Special notes

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

Stroke mimics include:

- intoxication – drug/alcohol
- hypo/hyperglycaemia
- seizures
- brain tumour – primary or secondary
- syncope
- migraine
- sepsis
- electrolyte disturbances (Na+, K+, Ca++)
- inner/middle ear disorder
- subdural haematoma

Transient ischaemic attack (TIA)

There are strong similarities between minor ischaemic strokes and TIAs.

Rapid assessment and management have been shown to reduce the rate of subsequent stroke. Approximately 25 per cent of TIAs are related to carotid stenosis and AF.

The ABCD² tool may assist with prognostic indicators. A score of > 4 is suggestive of high risk of stroke (max score = 7)

A = Age ≥ 60 years (1 point)

B = BP: systolic ≥ 140 and/or diastolic ≥ 90 (1 point)

C = Clinical features: unilateral weakness (2 points), speech impairment without weakness (1 point)

D = Duration: ≥ 60 min (2 points), 10–59 min (1 point)

D = Diabetes (1 point)

Stroke assessment tool finding			
Facial droop	Patient shows teeth or smiles	Normal – both sides of face move equally	Abnormal – one side of face does not move as well as the other
Speech	Patient repeats 'You can't teach an old dog new tricks'	Normal – the patient says the correct words, no slurring	Abnormal – the patient slurs words, says the wrong words, or is unable to speak or understand
Hand grip	Test as for GCS	Normal – equal grip	Abnormal – unilateral weakness
Blood glucose	Test for BGL	Normal BGL	Abnormal – If hypoglycaemia manage as per hypoglycaemia RANEG (p 52)

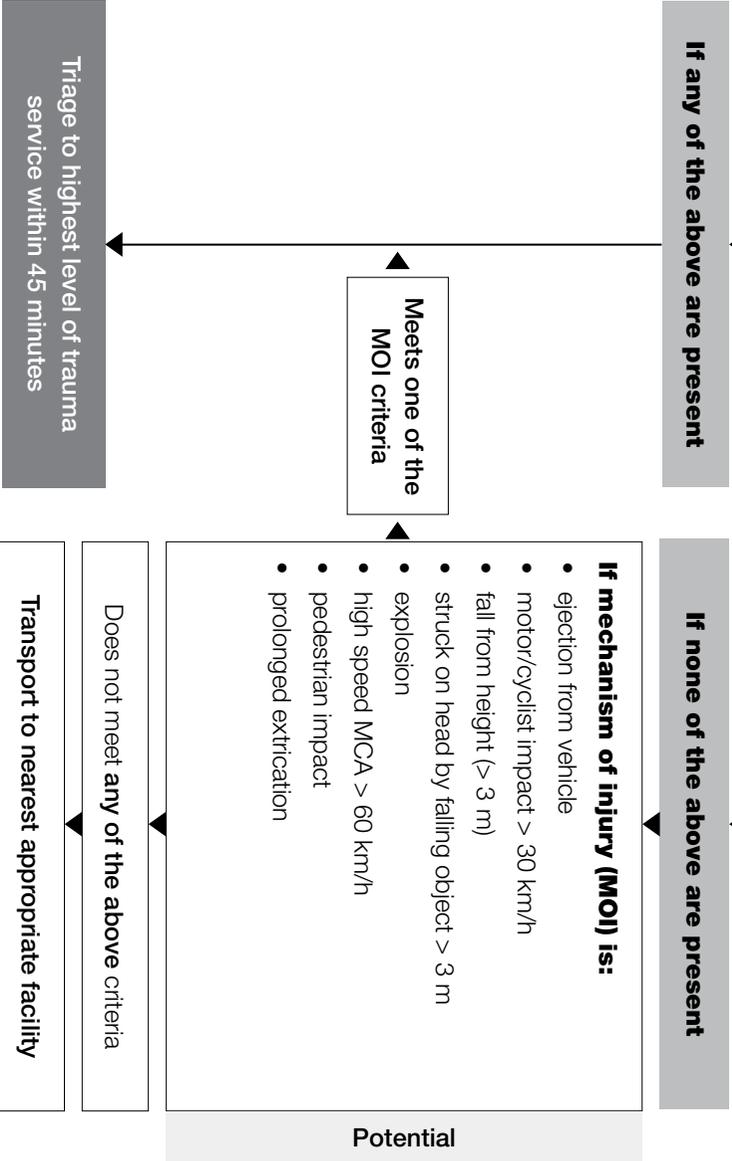
Trauma Time Critical Guidelines (paediatric)

Trauma Time Critical Guidelines (paediatric)

Vital signs (major trauma if any one of the following present)				
Age	0-3 months	4-12 months	1-4 years	5-11 years
HR	< 100 or > 180	< 100 or > 180	< 90 or > 160	< 80 or > 140
RR	> 60	> 50	> 40	> 30
Syst BP	< 50 mmHg	< 60 mmHg	< 70 mmHg	< 80 mmHg
SpO ₂	< 90%			
GCS	< 15 (or less than Alert on AVPU)			

or

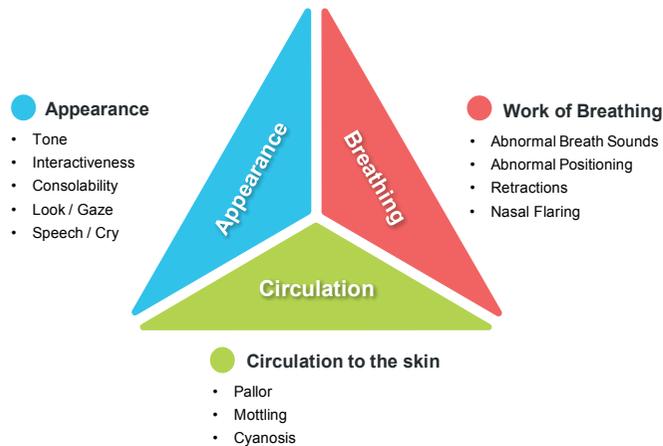
Injuries (major trauma if any one of the following present)	
<ul style="list-style-type: none"> • All penetrating injuries (except isolated superficial limb injuries) • Blunt Injuries <ul style="list-style-type: none"> - Serious injury to a single body region such that specialised care or intervention may be required or such that life, limb or long-term quality of life may be at risk - Significant injuries involving more than one body region 	<ul style="list-style-type: none"> • Specific injuries <ul style="list-style-type: none"> - Limb amputations/limb threatening injuries - Suspected spinal cord injury or spinal fracture - Burns > 10% TBSA or suspected respiratory tract burns - Serious crush injury - High voltage burn injury - Major compound fracture or open dislocation - Fracture to two or more of the following: femur/tibia/humerus - Fractured pelvis



Emergency assessment (paediatric)

Version: 4 Reviewed: December 2018

Paediatric Assessment Triangle



Subjective assessment

- Take history of presenting condition:
 - time of onset
 - decreased responsiveness and activity
 - complaints or indications of pain, such as tugging at ear
 - appetite and recent nutritional intake, ability to feed
 - fluid history/degree of dehydration
 - activity prior to onset, such as play, sleep
- Gather associated information:
 - home interventions; time and dosage of medication
 - response to treatment measures
 - sick siblings or playmates
- Take medical history:
 - previous illness
 - known allergies
 - medications
 - immunisation status and past reactions; recent injections
 - family medical history

Objective assessment

- Check vital signs:
 - temperature, pulse, respirations in all children; blood pressure in those acutely ill
 - respiratory rate and effort, nasal flaring, intercostal or sternal retraction, or use of accessory muscles should be assessed
 - skin colour and temperature, capillary refill
- Check weight
- Check BGL
- Check for clinical signs of dehydration:
 - decreased urine output
 - check number of nappies used or trips to toilet beware – unreliable in presence of diarrhoea **weight** may be better indicator
 - lethargy
 - dry mucous membranes
 - reduced skin turgor
 - sunken fontanelles in infants
- Assess mental status and level of activities (these are also signs of dehydration):
 - listlessness
 - if older child – response to questions
 - if infant – response to environment and stimulus

The most common signs of serious illness in a child under the age of six months are:

- difficulty in breathing
- decreased ability to feed
- decreased responsiveness and activity
- passing less urine
- cold legs (poor circulation – late sign)

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

Normal values (paediatric)

Version: 8 Reviewed: December 2018

1. Definitions

Newborn: first minute to 24 hours following birth

Small infant: < 3 months

Large infant: 3-12 months

Small child: is of pre school age
(1-4 years)

Medium child: is of pre school to primary school age
(5-11 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:

Age	Weight
Newborn	3.5 kg
3 months	6 kg
6 months	8 kg
1 year	10 kg
1-9 years	age x 2 + 8 kg
10-11 years	age x 3.3 kg

For children up to the age of 11 (inclusive), drug doses are quoted on a dose per kilo basis. The calculated dose is correct even if it exceeds the usual adult dose.

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.

3. Paediatric reference chart (normal values)

Age	0 mth	3 mth	6 mth	1	2	3	4	5	6	7	8	9	10	11	Yrs
Weight	3.5	6	8	10	12	14	16	18	20	22	24	26	33	36	kg
Resps Normal lower limit	25	25	25	20	20	20	20	16	16	16	16	16	16	16	/min
Resps Normal upper limit	60	60	55	40	40	40	40	34	34	34	34	34	34	34	/min
Pulse Normal lower limit	110	110	105	85	85	85	85	70	70	70	70	70	70	70	/min
Pulse Normal upper limit	170	170	165	150	150	150	150	135	135	135	135	135	135	135	/min
SBP Normal lower limit	60	60	65	70	70	70	70	80	80	80	80	80	80	80	mmHg

Glasgow Coma Scale (GCS) (paediatric)

Version: 5 Reviewed: December 2018

Child ≤ 4 years		Child > 4 years	
Eye opening			
Spontaneously	4	Spontaneously	4
Reacts to speech	3	To voice	3
Reacts to pain	2	To pain	2
No response	1	No response	1
Best verbal response			
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
No response	1	No response	1
Best motor response			
Spontaneous	6	Obeys commands	6
Localises to pain	5	Localises to pain	5
Withdraws from pain	4	Withdraws from pain	4
Flexion response	3	Flexion response	3
Extension response	2	Extension response	2
No response	1	No response	1
Total		Total	

Perfusion Status Assessment (paediatric)

Version: 5 Reviewed: December 2018

1. Normal blood volume

- Newborn – approximately 80 mL/kg
- Infant and child – approximately 70 mL/kg.

2. Criteria

No Perfusion

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

Inadequate perfusion

Any deviation from normal perfusion values is a source of concern.

Children presenting with abnormal vital signs must be transported to hospital.

- Skin – cool, pale, clammy.
In the setting of an unwell child, cold hands/feet and mottled skin are an early sign that correlates with subsequent ICU admission.
This should always be treated as a significant finding.
- Conscious state - patient responding to voice, pain or unresponsive.
May present as restless/agitated.

Adequate perfusion

Age	Pulse	SBP
Newborn	110-170	> 60 mmHg
Small infant	110-170	> 60 mmHg
Large infant	105-165	> 65 mmHg
Small child	85-150	> 70 mmHg
Medium child	70-135	> 80 mmHg

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

Respiratory Status Assessment (paediatric)

Version: 4 Reviewed: December 2018

1. Normal respiratory rates

Newborn	25-60 breaths/min
Small infant	25-60 breaths/min
Large infant	25-55 breaths/min
Small child	20-40 breaths/min
Medium child	16-34 breaths/min

2. Criteria

a) Signs of respiratory distress include:

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

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
- bounding pulse
- hypertension
- pupillary dilatation
- 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.

Pain assessment (paediatric)

Version: 5 Reviewed: December 2018

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 & Wong 1987) may be helpful in assessing paediatric pain.

Question the child

Use pain rating scales

Evaluate behaviour and physiological changes

Secure parent's involvement

Take cause of pain into account

Take 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 useful for children under three years of age or who are unable to communicate. Each of the five categories (Face, Legs, Activity, Cry, Consolability) is scored from 0 to 2 and the scores are added to get a total from 0 to 10. Behavioural pain scores need to be considered within the context of the child's psychological status, anxiety and other environmental factors.

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

Source: The FLACC is a behaviour pain assessment scale which is © University of Michigan Medical Centre and reproduced with permission for clinical use.

Wong – Baker FACES™ pain rating scale

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

Figure 3: Wong-Baker FACES™ pain rating scale



Verbal numerical rating scale

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

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Part B - Resuscitation

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Principles of CPR

Version: 9 Reviewed: December 2018

CPR

Upon diagnosis of cardiac arrest, CPR is to be commenced immediately and continued throughout cardiac arrest as required.

Management priorities are early commencement of external cardiac compressions (ECC) and if indicated direct current counter shock (DCCS). If single responder DCCS is to be performed prior to CPR. Patient is reassessed at the end of each 2 minute cycle of CPR.

The roles of initial airway management (beyond basic head tilt) and mechanical ventilation prior to ECC and DCCS are no longer indicated.

Generic for all adult and paediatric cardiac arrest conditions.

- CPR must not be interrupted for more than 10 seconds during rhythm/pulse checks.
- If unsure of pulse, recommence CPR immediately.
- Change operators every 2 minutes to improve CPR performance and reduce fatigue.
- **Rhythm/pulse check every 2 minutes.**
- CPR commenced immediately after defibrillation and pulse check after 2 minutes.

Automated External Defibrillator (AED)

- An AED should be used for all cardiac arrest patients. In patients <13 years of age, it is preferable that the AED has a paediatric adaptor or built-in capability to enable age appropriate joule delivery. In the absence of a paediatric capable AED, any AED should be used for paediatric patients in cardiac arrest.

Adjustment for temperature

≥ 30 °C

- Cardiac arrest RANEG (p 22 and 26)

< 30 °C

- Double time **intervals** between drug dosage in relevant Cardiac arrest RANEG (p 22 and 26)
 - Do not rewarm > 33 °C if ROSC

Traumatic cardiac arrest

- The intent is to **prioritise** haemorrhage control and managing correctable causes prior to other therapies
- Priorities include oxygenation and ventilation (insertion of LMA where appropriate); exclusion of tension pneumothorax (by insertion of Air Release System (ARS)); and administration of **Sodium Chloride 0.9% 20 mL/kg IV** in order of clinical need.
- This should be followed by routine cardiac arrest management including cardiac rhythm check. Once correctable causes have been addressed, a cardiac rhythm check and other standard cardiac arrest therapies such as compressions and adrenaline should be administered.
- In cases where the Hx, MOI or injuries are inconsistent with traumatic cardiac arrest, or patient is in VF/VT, consider medical cause. If any doubt exists as to the cause of arrest, treat as per Medical Cardiac Arrest.
- Control of major haemorrhage is a priority and can be achieved with tourniquets, haemostatic dressings and/or direct pressure.

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

Withholding or Ceasing Resuscitation

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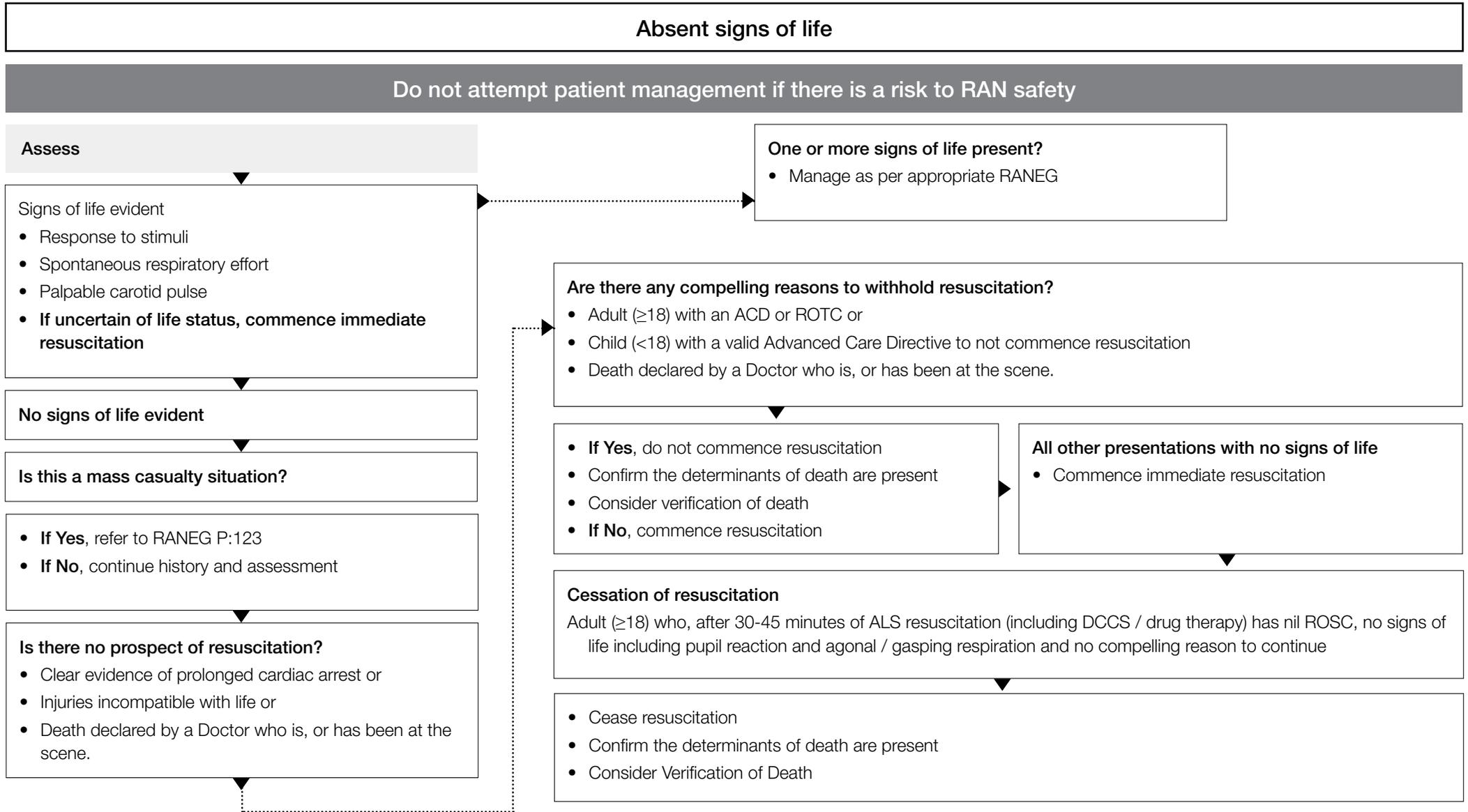
Special Notes

- Mass casualty incidents are in part characterised by the available resources being overwhelmed by larger patient numbers. Where this is the case AV Emergency Management Unit provide trauma triage guidelines for patient assessment that may differ significantly from guidelines used in other patient situations.
- Prolonged cardiac arrest may be determined in two ways. The first is where there is clear evidence of decomposition / putrefaction, rigor mortis or post mortem lividity.
- Prolonged cardiac arrest may also be an adult presenting in asystole (verified with three monitoring leads over > 30 seconds) with the interval between cardiac arrest onset i.e. collapse and arrival of the crew at the patient > 10 minutes and where there are no compelling reasons to continue.
- Compelling reasons to commence or continue resuscitation include:
 - suspected hypothermia
 - suspected drug OD
 - a child (< 18 years)
 - a family member requests continued effort
 - any signs of life observed including pupil reaction or
 - agonal / ineffective gasping respiration - patient in VF or VT.
- Injuries incompatible with life are where there is no possibility of having survived i.e. decapitation, incineration and there are no signs of life. This is distinct from where it may be believed that there is no prospect for eventual survival due to injury severity. Traumatic cardiac arrest outcomes are poor but not futile.
- Poor prognostic factors in cardiac arrest resuscitation include unwitnessed arrest, no prior bystander CPR and duration of cardiac arrest exceeding 30 minutes.
- The withholding of CPR may also occur when:
 - the RANS's safety will be compromised if they commence/continue
 - the operators are physically exhausted and nobody else is able to take over.
 - signs of life are evident
 - instructed to cease by a doctor on scene

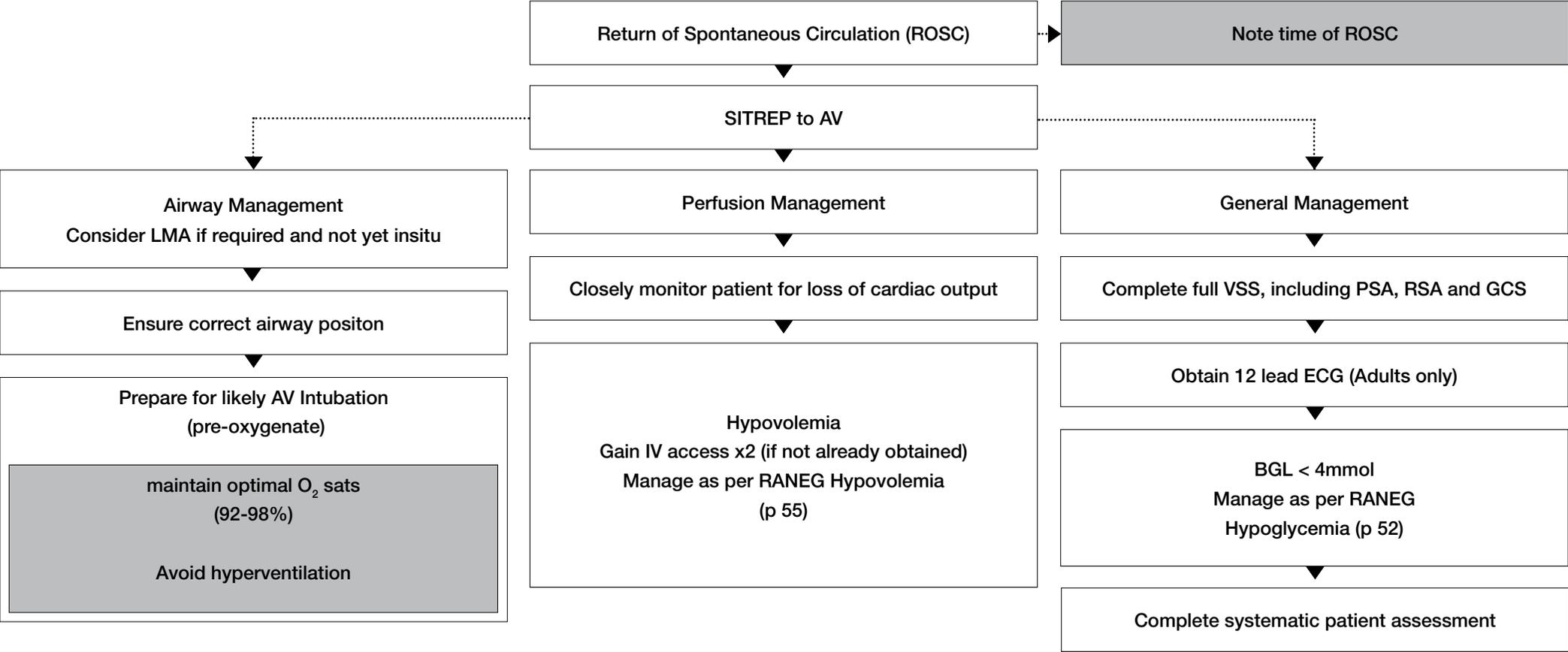
- Ambulance Victoria supports a person's right to articulate wishes for medical treatment and care in advance through an Advance Care Directive (ACD).
- A RAN may provide or withhold treatment based upon the patient's wishes as recorded on an ACD that is sighted by them or may accept, in good faith, the advice from those present at the scene of the patient's wishes and that this supporting documentation exists.
- A patient's ACD must be followed even where the emergency is not directly related to a pre-existing illness. If the person's wishes are unknown or there is doubt about the documentation or its existence, RANs are to provide routine care.
- RANs are required to include discussions of patient's wishes and decisions in their documentation.
- The Medical Treatment Planning and Decisions Act 2016 came into effect On March 12th 2018, replacing The Medical Treatment Act 1988.
- The new Act has given statutory recognition to Advance Care Directives and simplified laws regarding medical treatment decision making for people without decision making capacity
- ACD replaces any former refusal of treatment documentation (including ROTC).
- Enduring power of attorney (medical treatment) is now superseded by Medical Treatment Decision Maker from this date
- Enduring power of attorney (medical treatment) and previous advance care documentation made prior to March 12th 2018, remain valid under the provisions of the new Act.
- For more information, visit: <http://www.health.vic.gov.au/acp/>

Withholding or Ceasing Resuscitation

page 2 of 2 Version: 2 Reviewed: December 2018



Return of Spontaneous Circulation (ROSC) Management



Return of Spontaneous Circulation (ROSC) Management

page 2 of 2 Version: 2 Reviewed: December 2018

Return of Spontaneous Circulation (ROSC) is the resumption of sustained perfusing cardiac activity associated with significant respiratory effort after cardiac arrest.

Signs of ROSC include breathing, coughing, or movement and a palpable pulse or a measurable blood pressure.

Cardiopulmonary resuscitation and defibrillation increase the chances of ROSC.

Management must be initiated for all patients post cardiac arrest.

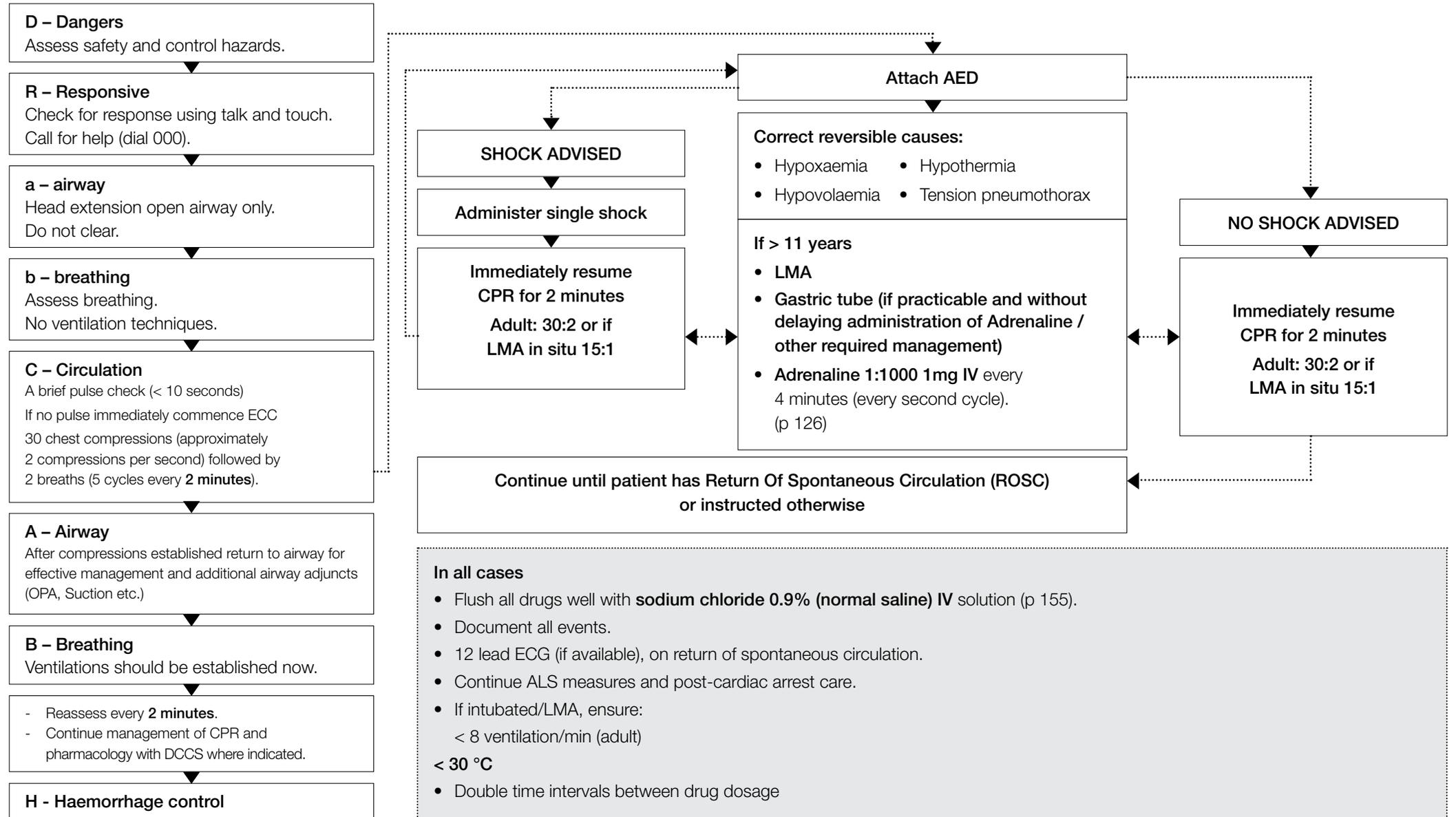
The aim of ROSC management is to stabilise the patient and reduce the likelihood of re-arrest by addressing reversible causes.

General care;

- Excessive fluid administration during the intra-arrest and post-ROSC period may be detrimental. Judicious administration of fluid may be especially important in VF/VT. The total volume of fluid administered during a cardiac arrest should not exceed 20mls/kg unless correcting suspected Hypovolemia. (p 55)
- Where the cause of the arrest is unclear, RAN's should assume a cardiac cause and provide appropriate SITREPS and request immediate evacuation to a PCI capable facility.
- Where resources allow and other priorities have been addressed, BGL should be measured post ROSC and treated as per Hypoglycemia (p 52)

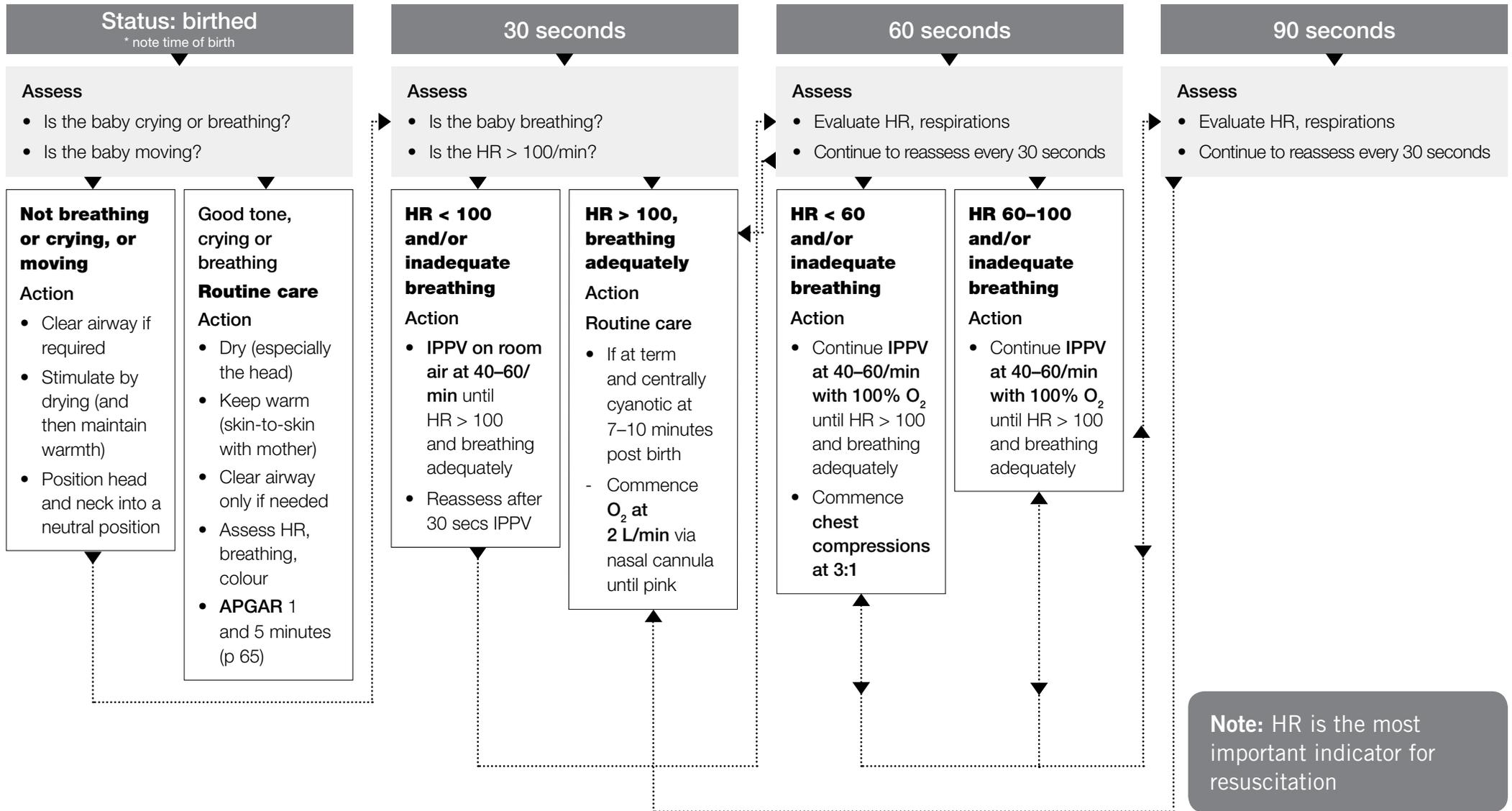
Cardiac arrest (adult)

Version: 11 Reviewed: December 2018



Newborn resuscitation

Version: 4 Reviewed: November 2016



Newborn basic life support

page 1 of 2 Version: 4 Reviewed: November 2018

Introduction

Definition of newborn: from the first minute to hours following birth. It is acceptable to consider a newborn as being 24 hours old to allow for completion of the lung and cardiovascular transition (though this may take up to 96 hours).

Airway

Position: Place head and neck in a neutral position avoiding neck flexion and head extension.

Suctioning: Newborns who are not vigorous at birth (not breathing and poor muscle tone) only require airway suctioning if born through meconium-stained liquor.

- The mouth should be suctioned followed by the nose. The newborn is a nasal breather and may gasp pharyngeal fluid if the nose is cleared first.
- Pharyngeal suctioning can cause laryngospasm and bradycardia through vagal stimulation. Suctioning must be gentle and brief (5–6 seconds) with a 10 or 12 FG catheter.

Oropharyngeal airway:

Not recommended for routine use in newborns with a normal airway as it can cause obstruction and vagal reactions. Only use for airway obstruction or airway abnormality. Size 00, 0.

Breathing

Ventilation:

The majority of newborns needing resuscitation at birth are apnoeic and bradycardic but rarely asystolic. Hypoxia eventually depresses respiratory drive and causes bradycardia.

Prompt improvement in HR > 100 per minute (assessed using a stethoscope over the apex of the heart) is the primary indicator of adequate ventilation. Increased pressure may be required for initial breaths.

Ventilation rate: 40–60 per minute

Tidal volume: 5–10 mL/kg via BVM, initially with room air. If HR remains < 100 per minute after 30 seconds, supply high-concentration oxygen to BVM

Ventilator bag: Use a ~250 mL newborn self inflating bag with newborn-sized face mask.

PEEP: Where available use 5 cm PEEP valve attached to BVM during IPPV. PEEP is important in improving lung volume and establishing and maintaining functional residual capacity.

Circulation

Chest compressions: Chest compressions are rarely required unless the heart rate is < 60 beats per minute despite effective ventilation for at least 30 seconds.

The first minute of resuscitation should not compromise airway techniques and ventilation where the HR < 100 per minute.

If after one minute the HR remains < 60 per minute, compressions should be commenced.

Compression depth: 1/3 depth of chest diameter

Site: over lower third of sternum

Compression method: The two thumb method is preferred in the two rescuer setting.

The two finger alternative preferred in single rescuer situations to minimise transition time.

Compression: ventilation ratio 3:1 at 120 compressions per minute in order to achieve 90 compressions and 30 breaths per minute with 0.5 second pause for ventilation.

- Reassess heart rate every 30 seconds until HR > 60 per minute when compressions may be ceased.
- Continue IPPV/APPV until HR > 100 per minute and spontaneous effective ventilations are present.

Pulse oximetry

Where available, attach newborn SpO₂ probe to right hand to allow continuous evaluation of heart rate and SpO₂. This negates the need to stop chest compressions to evaluate heart rate.

Environment: body temperature

Place the newborn on a warm, flat surface, cover with bubble wrap and warm wraps.

Cover head with woollen hat or corner of blanket.

Pre-term newborns (< 28 weeks) should be placed immediately (without drying body) into a polyethylene zip-lock bag with head (dried) outside and then placed against mother and covered with warm blankets.

Cutting the cord

The cord must be cut to allow effective resuscitation. Usually done after initial basic tactile efforts and commencement of IPPV.

Newborn basic life support

page 2 of 2 Version: 4 Reviewed: December 2018

Key points:

If poor respiratory effort and/or poor muscle tone and HR < 100 bpm	Assess for thick meconium or blood in airway & suction IF required (mouth first, then nose)
If after 30 seconds from birth HR < 100 bpm and/or not breathing	Commence IPPV Ventilate at a rate of 40–60/min with tidal volume of 5–10 mL/kg initially room air
If after 60 seconds from birth and HR < 100 bpm	Continue IPPV and attach high flow O ₂ to BVM
If HR < 60 bpm	Commence CPR Cease compressions when HR > 60 bpm Continuous IPPV until HR > 100 bpm and spontaneous effective ventilations present”

Figure 1: Hand Encircling two thumb method



Figure 2: Alternative two finger method

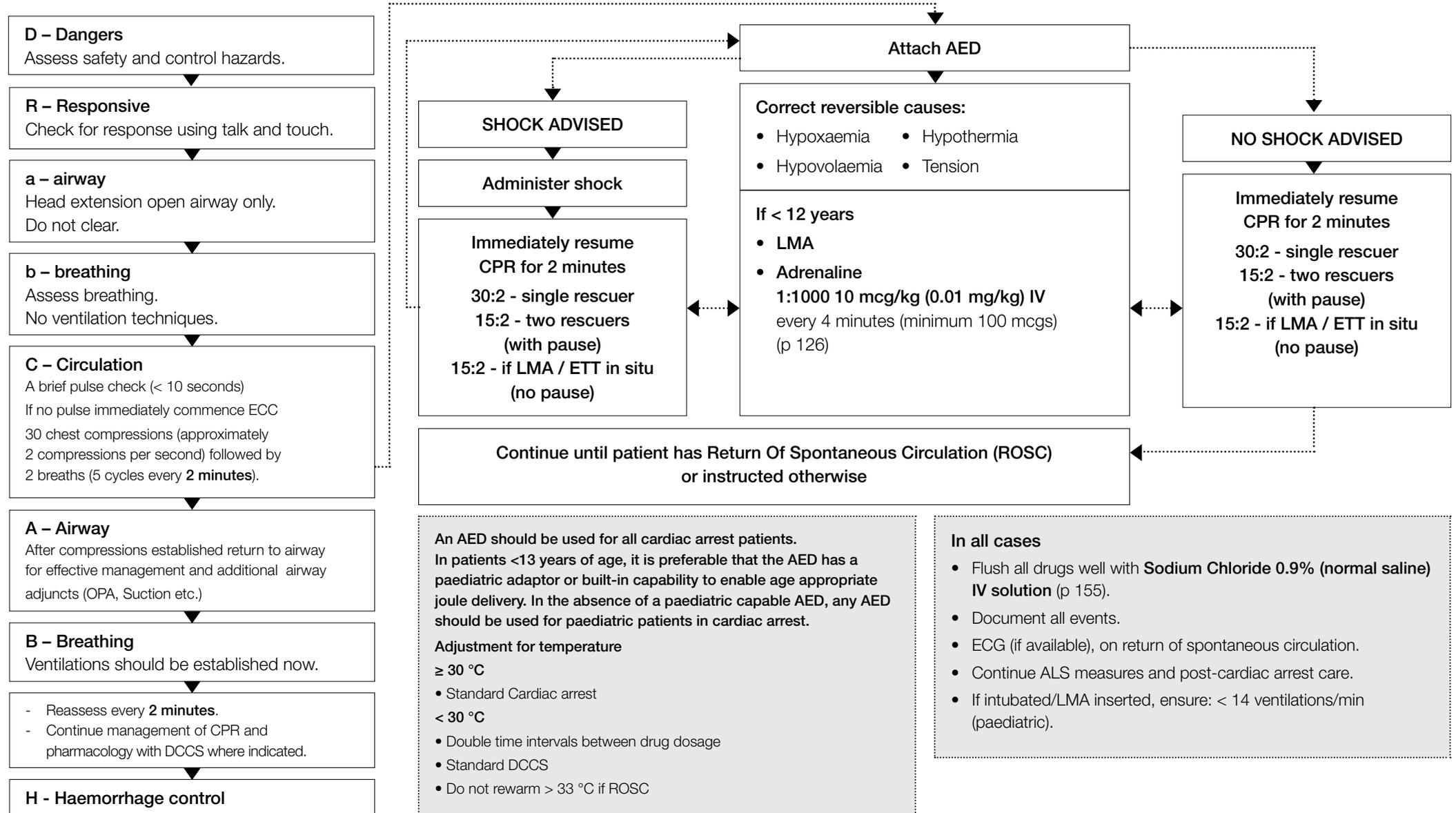


Note: HR is the most important indicator for resuscitation

Note: effective ventilation is the key to newborn resuscitation

Cardiac arrest (paediatric)

Version: 11 Reviewed: December 2018



Basic life support (paediatric)

Version: 8 Reviewed: December 2018

Introduction

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 and appears pale or cyanosed or is apnoeic or pulseless. Examples of conditions causing cardiac arrest in infants and children are trauma, drowning, septicaemia, SIDS, asthma, upper airway obstruction and congenital abnormalities of the heart and lung.

Infants and children most commonly arrest into severe bradycardia or asystole and this influences the order of resuscitative actions. Ventricular fibrillation may occur, associated with congenital heart conditions or secondary to poisoning with 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 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 (≥ 12 years) may be treated as per the adult RANEGs.

Airway

To assess an airway in an 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.

Position the head and neck to maintain an open airway:

- Infants: head and neck should be placed in the neutral position, avoiding additional neck flexion and head extension. Infants may also require padding under the shoulders/back (ramping) to maintain neutral alignment due to their comparatively larger head/occiput.
- Children: use neck flexion and head extension with caution in younger children.

If necessary use chin lift or jaw thrust to clear airway. The pharynx should be inspected with a laryngoscope and cleared of secretions using a Yankauer sucker. Magill's forceps may be needed to remove a foreign body.

Breathing

If spontaneous ventilation is not present, an appropriate size oropharyngeal airway should be inserted and assisted ventilation should be commenced immediately using supplemental oxygen. **Effective airway control and adequate ventilation with oxygen supplementation is the keystone of paediatric resuscitation.**

Circulation

Commence external cardiac compression (ECC) if a pulse is not palpable, or < 60 bpm (infant) or < 40 bpm (child).

Ventilations via BVM should be delivered during a pause in chest compressions to allow adequate expansion of the lungs. Once LMA inserted / intubated interruption of chest compression for ventilation is not necessary as effective ventilation can be given against the resistance imposed by chest compression.

a) External cardiac compression:

Compress lower half of the sternum approximately 1/3 depth of the chest using:

Infant	If single rescuer, use two fingers If two rescuers encircle the chest with both hands, compressing the sternum anteriorly with the thumbs while stabilising the vertebral column posteriorly with the fingers without restricting chest expansion
Child	Two hands as for adults

Timing and depth

Approximately 1/3 the depth of the chest for all age groups. Approximately 50% of a compression cycle should be devoted to compression and 50% to relaxation.

b) Ratios of compressions to ventilations:

Infants and children

Single rescuer:	30 compressions to 2 ventilations
Two rescuers/LMA in situ:	15 compressions to 2 ventilations
Rate:	approximately 100 compressions per minute

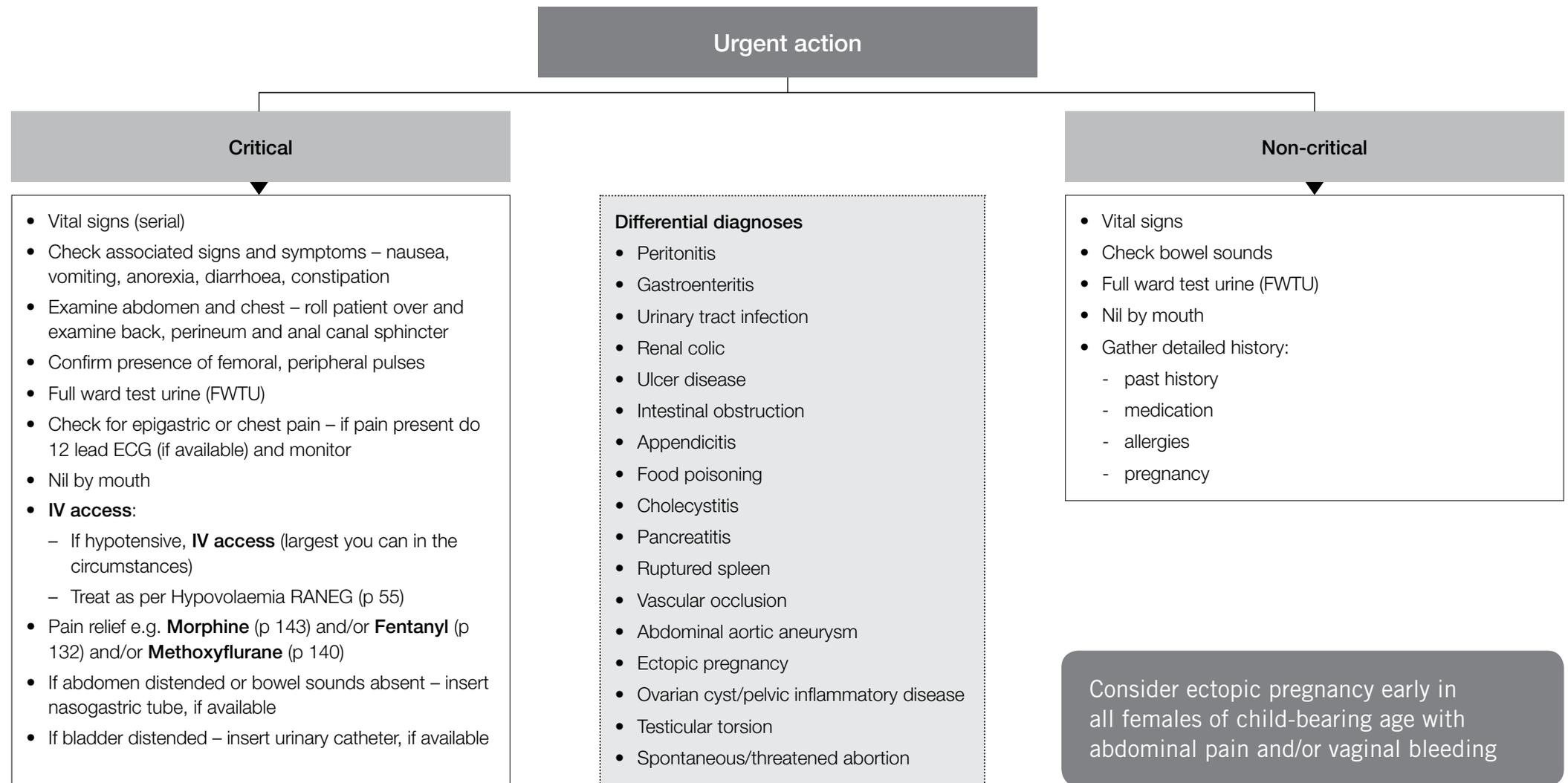
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Abdominal pain (adult & paediatric)

Version: 4 Reviewed: December 2018



Abdominal pain assessment

Version: 3 Reviewed: December 2018

Triage assessment

- DRABCD
- Note body position and non-verbals, i.e. facial grimacing
- GCS

Subjective assessment

- Assess pain – **PQRST** mnemonic

Provokes

- Aggravating factors
- Alleviating factors

Quality

- What does it feel like?
- Get the patient to describe the pain before offering choices:
 - sharp
 - burning
 - dull
 - stabbing
 - crushing

Radiates

- Where does the pain radiate?
- Is it in one place?

Severity

- Verbal analogue score (1–10)
- Consider non-verbal cues
- Paediatric pain assessment (p 15)

Time

- When did pain start?
- How long did it last?

Associated symptoms:

- Nausea or vomiting, haematemesis, and the relationship of these symptoms to the onset of pain
- Constipation, diarrhoea, melaena
- Belching or flatulence
- Urinary frequency, dysuria, observed haematuria
- Fever or chills
- Anorexia or weight loss
- Check gynaecological history:
 - menstruation
 - date of last period
 - normal/abnormal flow
 - possibility of pregnancy
 - sexually active
 - contraception used
 - number of previous pregnancies
 - vaginal discharge/bleeding
 - pain with intercourse
- Past medical history:
 - prior, concurrent illnesses or abdominal surgery
 - alcohol or drug abuse
 - history of trauma or injury
- Current medications: especially those such as aspirin or anti-inflammatory agents that may cause gastric side effects
- Dietary history
- Recent travel

Objective assessment

- Check vital signs:
 - obtain accurate temperature

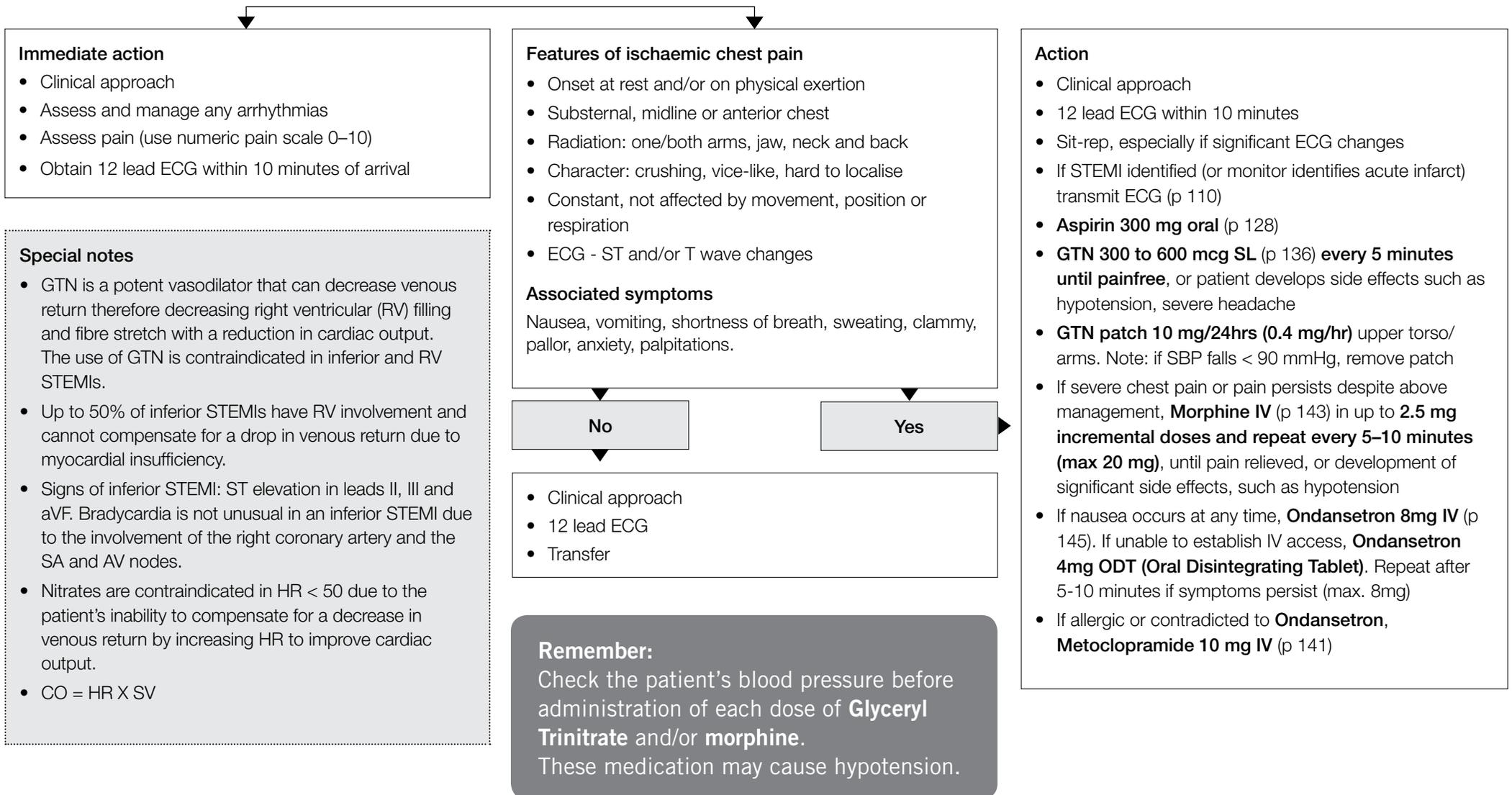
- pulse, respirations
- BP (lying and standing, if possible) on both arms, if able
- Inspect:
 - skin colour
 - scars
 - visible masses
 - distension
 - body positioning, activity, grimacing, etc.
- Auscultation:
 - performed before palpation
 - presence and frequency or absence of bowel sounds (always listen for five minutes before deciding bowel sounds are absent)
 - bruits
- Palpation:
 - begin a quadrant away from site of pain
 - direct or referred pain to palpation
 - abdomen soft/firm; guarding: voluntary/involuntary
 - masses or organomegaly
 - rebound tenderness
 - rigidity
 - bladder – is the bladder distended?
- FWTU
- bHCG urine test (if available)

Remember:

It is not necessary for you to make a medical diagnosis, but to be able to assess and recognise symptoms and signs that are clinically significant.

Acute coronary syndrome (adult)

Version: 10 Reviewed: December 2018



Chest pain assessment

Version: 5 Reviewed: December 2018

Triage assessment

- DRABCD
- Check skin colour, cyanosis, pallor
- Assess respiratory status, quality of respirations, unusual chest movement. Any other obvious problems?
- Assess general appearance, age

Subjective assessment

- Assess pain – **PQRST** mnemonic

Provokes

- Aggravating factors
- Alleviating factors

Quality

- What does pain feel like?
- Get the patient to describe the pain before offering choices:
 - sharp
 - burning
 - dull
 - stabbing
 - crushing
- Is there change in pain with deep inspiration, cough or movement?

Radiates

- Where does the pain radiate?
- Is it in one place?

Severity

- Pain – verbal analogue scale (0–10).
- Consider non-verbal cues

Time

- When did it start?
- How long did it last?

History taking must not delay intervention

- Check associated symptoms:
 - nausea, vomiting
 - shortness of breath
 - sweat, cold, clammy
 - cough, productive/non-productive
 - fever
 - racing heart, palpitations
- Pain relieved by: rest, GTN, antacids, O₂
- Past medical history:
 - previous myocardial infarction, cardiac surgery, angina
 - medications, in particular: digoxin, diuretics, beta-blockers, antihypertensives, GTN, illicit drug use, (such as cocaine, 'speed')
 - risk factors:
 - smoking
 - hypertension
 - diabetes
 - positive family history
 - hyperlipidemia
 - obesity
 - recent stress, illness or exertion

Objective assessment

- Obtain vital signs and monitor frequently:
 - GCS: may be altered because of hypoxia
 - respiratory effort:
 - effectiveness of ventilation
 - use of accessory muscles
 - breath sounds:
 - compare bilaterally
 - presence of crackles, wheezes
- Skin colour: pale, cyanotic, ashen or flushed

- Skin temperature: warm, cool or diaphoretic
- 12 lead ECG, (if available) within 10 minutes. Acute changes include ST elevation, T wave inversion, Q wave formation, ectopic beats or rhythm disturbance

Differential diagnoses of chest pain

- Myocardial infarction
- Angina
- Dissecting thoracic or aortic aneurysm
- Muscle strain
- Oesophagitis
- Pericarditis
- Pneumothorax
- Pulmonary embolus
- Shingles

Many patients present with 'chest pain'

The fundamental issue is:

- Is the patient having an AMI/unstable angina?

The following guidelines may assist:

- If the patient has had 'ischaemic chest pain' ≥ 30 minutes, or a number of episodes or a change in quality, provocation, the patient should be transferred and investigated.
- The ECG should be used to **support** the diagnosis, never to **refute** it. It is not a criterion for sending someone home. A **normal ECG** does not exclude myocardial ischaemia.

Airway obstruction - choking (adult & paediatric)

Version: 5 Reviewed: December 2018

Consider medical or causes of airway obstruction (eg. Anaphylaxis, Croup, Epiglottitis).

While anybody can have a foreign body obstruction, a child aged six months to four years is at greatest risk of choking due to behaviour, airway size and underdeveloped muscle control. Foods such as hard lollies, peanuts and small toy parts are often a source of obstruction.

Complete obstruction will rapidly progress to unconsciousness and cardio respiratory arrest unless relieved. A high index of suspicion should be held when a patient is in cardio respiratory arrest that is unable to be ventilated.

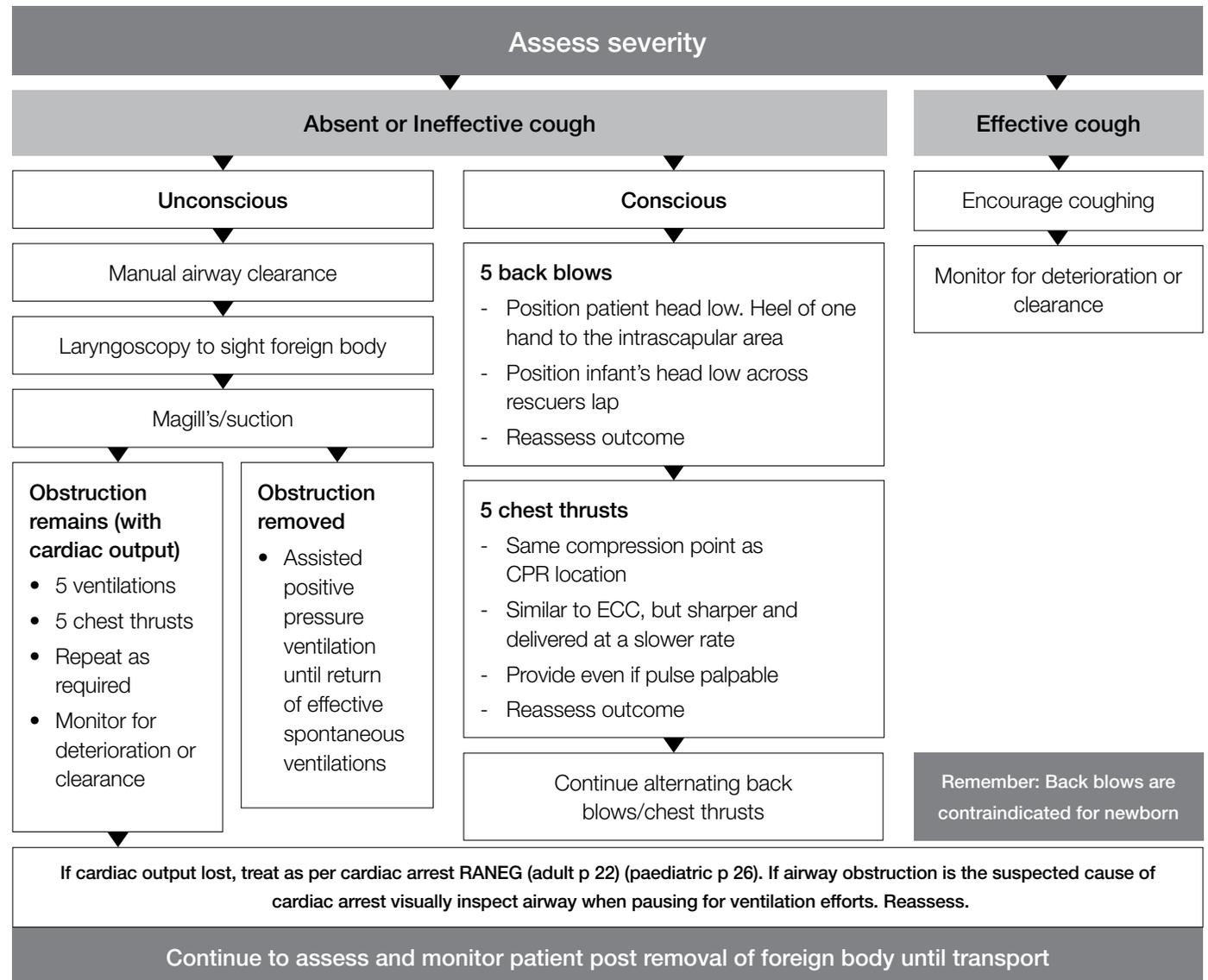
Partial obstruction signs/symptoms:

- Stridor, wheeze
- Noisy breathing
- Tachypnea
- Retractive breathing
- Anxiety
- Drooling and/or coughing
- May have altered conscious state

Complete obstruction signs/symptoms:

- Unable to talk
- Altered conscious state or LOC
- Paradoxical movement
- No air movement
- Cyanosis
- Cardio Respiratory Arrest

See p 112: Laryngoscopy - inspection of upper airway



Anaphylaxis (adult)

Version: 8 Reviewed: December 2018

Confirm clinical evidence of probable anaphylaxis/allergic reaction: History of exposure to substance(s) known to cause anaphylactic/allergic reaction such as recent insect bite, medications, exposure to food known to cause allergic reactions

Assess severity of systemic involvement

1. Anaphylaxis (life-threatening allergic reaction)

- Sudden onset of illness (mins to hours)

AND

- Two or more of **R.A.S.H.** with or without confirmed antigen exposure:

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

OR

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

- Clinical approach
- **Adrenaline 1:1000, 500 mcg (0.5 mg) IM.** May be repeated at 5 minute intervals until satisfactory results or adverse side effects occur. Small (\leq 60kg)/frail/elderly adults should be administered **300 mcg (0.3 mg) IM** instead.
- If after first dose of **Adrenaline** patient hypotensive, treat as per Hypovolaemia RANEG (p 55)
- Provide O2 as per oxygen RANEG (p 69)
- If evidence of bronchospasm, treat as per asthma RANEG (p 37)
- **Dexamethasone 8 mg IV** (p 131)
- Check vital signs at least 5 minutely while administering **Adrenaline** and/or **Sodium Chloride 0.9%** then at least 15 minutely or more frequently as required

2. Moderate allergic reaction

- Blotchy red rash
- Oedema of face, neck and soft tissue
- Retrosternal pain

In anaphylaxis **adrenaline** is life saving; however, ensure that the patient is cardiac monitored to enable early identification and treatment of arrhythmias.

3. Mild allergic reaction

Localised reaction only (not systemic)

- Restlessness
- Anxiety
- Isolated swelling (e.g. hand, leg)
- Light-headedness
- Isolated urticaria (hives)
- Skin flushing, itchiness

- Clinical approach
- If mild/moderate allergic reaction, **Promethazine 25 mg oral** and observe (p 153)
- If moderate allergic reaction, and if delay until medical assessment, **Dexamethasone 8 mg IV** (p 131)
- If mild bronchospasm, treat as per Asthma RANEG (p 37)
- Observe patient closely, as progression to anaphylactic shock may be rapid

Nebulised **Adrenaline 5 mg** may be used in conjunction with **IM adrenaline** (or alone) for isolated *mild upper airway obstruction*.

Advise patient of potential effects of **Adrenaline** prior to administration.

Anaphylaxis (paediatric)

Version: 7 Reviewed: December 2018

Confirm clinical evidence of probable anaphylaxis/allergic reaction: History of exposure to substance(s) known to cause anaphylactic/allergic reaction such as recent insect bite, medications, exposure to food known to cause allergic reactions

Assess severity of systemic involvement

1. Anaphylaxis (life-threatening allergic reaction)

- Sudden onset of illness (mins to hours)

AND

- Two or more of **R.A.S.H.** with or without confirmed antigen exposure:
 - **R** Respiratory distress (SOB, wheeze, cough, stridor)
 - **A** Abdominal symptoms (nausea, vomiting, diarrhoea, abdominal pain/cramps)
 - **S** Skin/mucosal symptoms (hives, welts, itch, flushing, angioedema, swollen lips/tongue)
 - **H** Hypotension (or altered conscious state)

OR

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

- Clinical approach
- **Adrenaline 1:1000, 10 mcg/kg (0.01 mg/kg) IM**
If necessary increments of **Adrenaline 10 mcg/kg (0.01 mg/kg) IM** every 5 minutes, until improvement or adverse side effects occur (p 126)
- Vital Signs at least 5 minutely while administering **Adrenaline**, then every 15 minutes or more frequently, as required
- Provide high flow O₂
- If evidence of bronchospasm, treat as per asthma RANEG (p 37)

2. Moderate allergic reaction

- Blotchy red rash.
- Oedema of face, neck and soft tissue.
- Retrosternal pain

In anaphylaxis **adrenaline** is life saving; however, ensure that the patient is cardiac monitored to enable early identification and treatment of arrhythmias.

3. Mild allergic reaction

Localised reaction only (not systemic)

- Restlessness
- Anxiety
- Isolated swelling (e.g. hand, leg)
- Light-headedness
- Isolated urticaria (hives)
- Skin flushing, itchiness

- Clinical approach
- If mild/moderate allergic reaction, **Promethazine 1mg/kg (maximum dose 25mg) oral** and observe (p 153)
- If evidence of bronchospasm, treat as per paediatric Asthma RANEG (p 37)
- Observe patient closely, as progression to anaphylactic shock may be rapid.

Nebulised **Adrenaline 5 mg** may be used in conjunction with **IM adrenaline** (or alone) for isolated *mild upper airway obstruction*.

Advise patient of potential effects of **Adrenaline** prior to administration.

Anaphylaxis assessment

Version: 7 Reviewed: December 2018

Avoid further allergen exposure

Triage assessment – DRABCD

- Presence of facial and neck oedema?

Subjective assessment

- Presenting symptoms:
 - dyspnoea, tightness in chest
 - dysphagia
 - itching
 - swollen lips, tongue or fingers
 - feelings of weakness, dizziness, syncope
 - anxiety, feeling of suffocation
 - warm, moist skin
 - paraesthesia
- Associated history:
 - time of onset of symptoms
 - sensitising agent, if known
 - allergies: history of similar reactions
 - underlying respiratory problems

Objective assessment

- Vital signs:
 - respiratory status: observe for coughing, wheezing, or stridor; change or loss of voice or swelling of mucous membranes; shortness of breath
 - GCS: restlessness or agitation; patient may complain of headache

- Skin condition:
 - sweating
 - flushing
 - rash, urticaria, weals
 - oedema
 - warmth
- Hypotension, thready pulse

- Cardiovascular problems tend to predominate with systemic injection e.g. insect stings/IV drugs.
- Respiratory problems tend to predominate where foods are absorbed transmucously - e.g. milk or egg.

- All anaphylactic reactions require admission and observation

Discharge guidelines

- Where the patient has a mild allergic reaction and has responded well to **Promethazine** (p 153) they may be discharged after a period of observation.
- Patient **must** be educated regarding:
 - further exposure to allergen
 - returning if recurrence of symptoms
 - allergy identification jewellery, if appropriate
 - follow-up medications, such as short course of antihistamines, if ordered
 - follow-up appointments, tests.

Special Notes

- All patients with suspected anaphylaxis must be transported to hospital regardless of the severity of their presentation or response to management (including self-administration of medication).
- Angio-oedema (vascular oedema) leads to increased tissue fluid, presenting as swelling, upper airway obstruction (throat tightness), orbital oedema and other systemic signs of swelling.
- Identify history of exposure to substances known to cause anaphylactic reaction, e.g. recent insect bite, medications, exposure to food known to cause anaphylactic reaction and presenting with evidence of systemic involvement.
- Research indicates most deaths from anaphylaxis occurred with a delay in administration of Adrenaline in severe reactions.

Asthma (adult)

page 1 of 3 Version: 9 Reviewed: December 2018

History

- Duration and nature of symptoms
- Treatment given
- Relevant trigger factors if known
- Previous life-threat episode
- Previous hospital admission (ward)
- Previous ICU admission (+/- with ventilation)
- Required a course of corticosteroids in past 6 months

Examination

- Respiratory status assessment (adult p 7)
 - is a good indicator of degree of severity
- GCS (adult p 5)

- Auscultatory findings:
 - especially note gross asymmetry in the loudness of the breath sounds or generalised marked decrease in their loudness (**silent chest**)
- Peak Expiratory Flow Rate (PEFR)
- SpO₂:
 - needs to be taken in context of illness in patient. **High SpO₂ does not necessarily mean milder disease**
- Monitor observations closely

- Patient presenting with a wheeze associated with heart failure and no Hx of asthma/COPD, treat APO as per respiratory distress RANEG (p 73).

Thunderstorm Asthma

- Occurs when a high number of people develop asthma symptoms in a short period of time
- It is thought to be triggered by a unique combination of high amounts of grass pollen in the air and a certain type of thunderstorm

For more information visit:

<https://www.betterhealth.vic.gov.au/campaigns/thunderstorm-asthma>

Special notes

- Asthmatic patients are dynamic and can show initial improvement with treatment then deteriorate rapidly.
- An improvement in SpO₂ may not be a sign of improvement in clinical condition. However O₂ saturations dropping is a late stage of very severe asthma.

Signs and symptoms	*Severe/life-threatening	Moderate	Mild
<ul style="list-style-type: none"> Appears Talks in Wheeze Chest movement Pulse rate Peak expiratory flow (% predicted) SpO₂ 	<ul style="list-style-type: none"> Distressed, exhausted, fighting to breathe Words Expiratory/inspiratory, maybe quiet Marked with accessory muscles, retraction, +/- tugging > 120 bpm¹ < 50% or < 100 Lpm < 92%; Cyanosis may be present² 	<ul style="list-style-type: none"> Distressed/anxious Phrases Expiratory +/- inspiratory Marked +/- accessory muscles 100–120 bpm 50–75% 92–95% 	<ul style="list-style-type: none"> Calm /mildly anxious Sentences Mild expiratory Slight increase < 100 bpm > 75% > 95%

* Any of these features indicates that the episode is severe. The absence of any feature does not exclude a severe attack.

1. Bradycardia may be seen when respiratory arrest is imminent.

2. Patients with severe asthma are unlikely to be able to perform PEFR measurements and it becomes unreliable for the classification of asthma severity. Equally O₂ saturation, by itself, IS NOT a good indicator of the severity of the episode.

Asthma (adult)

page 2 of 3 Version: 8 Reviewed: December 2018

Treatment

Transfer

Initial care

Salbutamol (p 154)

Ipratropium Bromide (p 138)

Dexamethasone (p 131)

Severe/life-threatening

- Yes
 - Clinical approach
 - **Salbutamol 10 mg nebulised**
 - Repeat **Salbutamol 5 mg nebulised every 5 mins as required** until patient symptom free and/or transferred
-
- **Ipratropium Bromide 500 mcg once only** in conjunction with the first dose of **nebulised Salbutamol**
-
- **Dexamethasone 8 mg IV** stat dose or if unable to establish IV access, **Dexamethasone 8mg IM**

Moderate

- Yes
 - Clinical approach
 - **Salbutamol via pMDI** (Pressurised Metered Dose Inhaler) with spacer **400 - 1200 mcg (4-12 puffs)** every 20 minutes until resolution of symptoms. (Patient to take **4 breaths** before each subsequent puff)
 - If salbutamol pMDI and spacer not available, **Salbutamol 10 mg nebulised and repeat 5 mg every 5 mins as required** until patient symptom free and/or transferred
 - If no significant response after 20 mins, or deteriorates, treat as severe/lifethreatening
 - If deterioration to **severe/life-threatening** occurs
-
- **Dexamethasone 8 mg IV** stat dose or if unable to establish IV access, **Dexamethasone 8mg IM**

Mild

- Consider
 - Clinical approach
 - **Salbutamol via pMDI** (Pressurised Metered Dose Inhaler) with spacer **400 - 1200 mcg (4-12 puffs)** every 20 minutes until resolution of symptoms. (Patient to take **4 breaths** before each subsequent puff)
 - If salbutamol pMDI and spacer not available, administer **Salbutamol 10 mg nebulised and repeat 5 mg every 5 mins as required** until patient symptom free and/or transferred
 - If no significant response after 20 mins, or deteriorates, treat as severe/lifethreatening
 - If deterioration to **severe/life-threatening** occurs
-
- Consider **Prednisolone 0.5–1 mg/kg oral (50 mg is appropriate in most adults)** (p 151) or **Dexamethasone 8 mg IV** stat dose or if unable to establish IV access, **Dexamethasone 8mg IM**
 - If **Dexamethasone** is administered patient must be transferred

continued over page

Asthma (adult)

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Treatment	Severe/life-threatening	Moderate	Mild
<p>Adrenaline (p 126)</p> <hr/> <p>Ventilation</p> <ul style="list-style-type: none">If patient is unconscious or becomes unconscious with poor or no ventilation (but still has a pulse) <hr/> <ul style="list-style-type: none">If patient becomes pulseless during assisted ventilation and the bag is stiff	<ul style="list-style-type: none">If not responding to treatment or is unconscious or becomes unconscious with poor or no ventilation (but still has pulse) Adrenaline 500mcg (0.5mg) IM (1:1000) repeated at 5-10 minute intervals as required to a maximum 1500 mcg (1.5 mg).If no response to IM Adrenaline or thunderstorm asthma suspected, consult ARV for IV Adrenaline 20 mcg at 2 minute intervals. <p>If Patient is not improving or deteriorating, consult. If you cant consult, give it anyway.</p> <hr/> <ul style="list-style-type: none">Ventilate at a rate of 5 – 8 breaths per minute, with a tidal volume of 6 -7 mL/ kg, using moderately high inspiratory pressure and allowing a long expiration time.If necessary insert LMA and ventilate at 5–8 breaths per minute as above <hr/> <ul style="list-style-type: none">Allow APNOEA for 1 minuteExclude Tension PneumothoraxIf pulse does not return, treat as for adult Cardiac Arrest RANEG (p 22).	<ul style="list-style-type: none">Not indicated	<ul style="list-style-type: none">Not indicated

Asthma (paediatric)

page 1 of 3 Version: 9 Reviewed: December 2018

History

- Duration and nature of symptoms
- Treatment given
- Relevant trigger factors if known
- Previous life-threatening episode
- Previous hospital admission (ward)
- Previous ICU admission (+/- with ventilation)
- Required a course of corticosteroids in past 6 months

Examination

- Respiratory Status Assessment (p 14)
 - is a good indicator of the degree of severity
- GCS (p 12)
- Auscultatory findings:
 - especially note gross asymmetry in the loudness of the breath sounds or generalised marked decrease in their loudness (**silent chest**)
- Peak expiratory flow rate (PEFR):
 - this recording presents several pitfalls in the acute episode in a child under seven years. If the child is not using the meter correctly, do not persist as the measurement will not be valid

- SpO₂:
 - needs to be taken in context of illness in patient; **High SpO₂ does not necessarily mean milder disease**

- Monitor observations closely

Special notes

- Asthmatic patients are dynamic and can show initial improvement with treatment then deteriorate rapidly
- An improvement in SpO₂ may not be a sign of improvement in clinical condition. However O₂ saturations dropping is a late stage of very severe asthma
- Children under 2 years of age should not be treated with **Salbutamol** as it is unlikely to provide benefit

Signs and symptoms	*Severe/life-threatening	Moderate	Mild
Appears Talks in (age appropriate) Wheeze Chest movement Pulse rate (age dependant) Altered consciousness Peak expiratory flow (% of predicted) SpO ₂	Increasing irritability +/- lethargy Words/unable to speak Inspiratory and expiratory/often quiet Marked with accessory muscles, retraction, +/- tugging >120 bpm ¹ Confused/drowsy < 40%/unable to perform ₂ < 92% ² Moderate/severe	Some irritability Phrases Expiratory +/- Inspiratory Marked +/- accessory muscles 100-120 Conscious /agitated 40-60% 92-95%	Calm Sentences Mild expiratory Slight increase <100 Conscious > 60% >95%

* Any of these features indicates that the episode is severe. The absence of any feature does not exclude a severe attack.

1. Bradycardia may be seen when respiratory arrest is imminent.

2. Patients with severe asthma are unlikely to be able to perform PEFR measurements and it becomes unreliable for the classification of asthma severity. Equally SpO₂, by itself, IS NOT a good indicator of the severity of the episode.

Asthma (paediatric)

page 3 of 3 Version: 9 Reviewed: December 2018

Treatment	Severe/life-threatening	Moderate	Mild
<p>Adrenaline (p 126)</p> <hr/> <p>Ventilation</p> <ul style="list-style-type: none">• If patient is unconscious or becomes unconscious with poor or no ventilation (but still has a pulse) <hr/> <ul style="list-style-type: none">• If patient becomes pulseless during assisted ventilation and the bag is stiff	<ul style="list-style-type: none">• If not responding to treatment or is unconscious or becomes unconscious with poor or no ventilation (but still has pulse) Adrenaline 10 mcg/kg (0.01 mg/kg) IM. Repeat every 5-10 mins as required to a maximum of 30 mcg/kg (0.03 mg/kg or 3 doses)• Ventilate at the following rates with a tidal volume of 10 mL/kg using moderately high inspiratory pressure and allowing a long expiration time<ul style="list-style-type: none">- Small child 12-15 breaths/min- Medium child 10-14 breaths/min• Gentle lateral chest pressure may be used to assist during expiration <hr/> <ul style="list-style-type: none">• Allow APNOEA for 30 seconds• Exclude tension pneumothorax• If pulse does not return, treat as for Paediatric Cardiac Arrest RANEG (p 26).	<ul style="list-style-type: none">• Not indicated	<ul style="list-style-type: none">• Not indicated

Burns (adult & paediatric)

page 1 of 2 Version: 6 Reviewed: December 2018

Major burn

- > 10% TBSA or > 5% full-thickness burn
- High-voltage burn
- Chemical burns
- Inhalation injury
- Any significant burn to face/neck/genitalia/major joint/hands/feet (even if < 5–10%)
- Circumferential limb or chest burn
- Significant associated injuries (major trauma p 83)
- Burns in the very young or elderly people
- Burns occurring in pregnant women

- Ensure safety and patient removal from burn mechanism; avoid chemical cross-contamination
- Clinical approach, assess airway and monitor continuously
- Remove all clothing and jewellery if possible. Do not remove material adhered to skin
- **Cool burn, warm the patient**
- Irrigate burn with low-pressure, tepid, tap water or **Sodium Chloride 0.9%** and continue for 20 minutes (effective for up to 3 hours post injury) - less in large TBSA burns where hypothermia may be induced
- Alternatively spray-misting water, immersion, or applying cool saline soaks can be considered. **Do not** use ice or ice water on any burn
- Protect remainder of patient from heat loss – assess/monitor temp, cover with blanket, avoid shivering
- IV access (x 2 large bore) through clean unburnt skin if possible
- Early analgesia: **Morphine** (p 143) and/or **Fentanyl** (p 132) and/or **Methoxyflurane** (140)
- Cover burn area with cling wrap once burn area has been cooled. Apply cling wrap longitudinally to avoid tourniquet effect with swelling
- Avoid commercial burn dressings unless no alternative
- Establish pre-burn weight and commence fluid resuscitation (over page)

Associated inhalation burn

Assess airway and breathing

Look for:

- burns occurred in an enclosed space
- burns to upper torso, neck, face
- facial and upper airway oedema
- dry red, oral and nasal mucosa
- singed facial and/or nasal hair
- soot particles in mouth, nose
- carbonaceous sputum

- respiratory difficulty/hypoxia/cyanosis
- hoarseness, stridor, frequent cough, or wheezing

If bronchospasm present consider

Nebulized Salbutamol (p 154) as per asthma RANEGs (Adult p 37) (Paediatric p 40).

Chemical burn

If liquid chemical, irrigate for as long as pain persists with water or a wash of **Sodium Chloride 0.9%** - avoid flushing onto uncontaminated areas

Chemical burns should not be wrapped in cling wrap (may worsen injury) - utilise clean, wet dressings instead

If non-liquid, brush off first, as some dry chemicals may react with water (has blue "dangerous when wet" sign)

For all patients

- Assess degree of total burn and classification (superficial, partial or full thickness).
- Signs of airway injury.

continued over page

Burns (adult & paediatric)

page 2 of 2 Version: 6 Reviewed: December 2018

Fluid replacement:

Fluid therapy is calculated from the time of injury.

Adult

- Partial or full thickness burns >15% TBSA
- **Sodium Chloride 0.9% IV** (volume in mLs) = % TBSA x patient weight (kg)
- Given over 2 hours from time of burn
- If Patient **12-15 years old Sodium Chloride 0.9% IV** as per Paediatric

Paediatric

- Partial or full thickness burns >10% TBSA
- **Sodium Chloride 0.9% IV** (volume in mLs) = 3 x % TBSA x patient weight (kg)
- Given over 24 hours from time of burn
- Administer half of the 24 hour volume over the first 8 hours

Monitor urine output (IDC) hourly, if available

Severe electrical burns may require additional fluid therapy to maintain adequate renal perfusion - consult with AV Clinician / burns centre.

Note: IV fluids to patient with airway burns may result in oedema and increase airway compromise. Attention must be given to airway patency during IV fluid administration. If possible intubation prior to IV fluid administration may be preferable.

Burns assessment

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Triage assessment

- DRABCD
- Extent of burns
- GCS
- Colour of burnt skin

Subjective assessment

- History of events from patient or witness:
 - consider abuse
 - type of burn agent (thermal, chemical, electrical, radiation)
 - length of time exposed
 - possibility of other injuries
- For electrical burns, determine:
 - voltage
 - length of contact with current
 - AC/DC/lightning
 - if thrown
 - if fell from height
- Past medical history
- Allergies and tetanus immunisation status
- Pain: (verbal analogue scale) superficial burns may be more painful than full-thickness
- Observe for dyspnoea: may have an associated inhalation injury that may take 12–24 hours to develop (observe closely)
- Consider all enclosed space steam burns as inhalation burns

Objective assessment

- Vital signs:
 - carefully evaluate respiratory status; skin burns may be accompanied by carbon monoxide or cyanide poisoning caused by the toxic products of combustion
 - rectal temperature in extensive burns
 - monitor level of consciousness: burns do not usually cause changes in mental state - check/consider other causes, such as hypoxia, hypotension, carbon monoxide poisoning (particularly in residential structure fires)
 - peripheral pulses must be monitored with extensive extremity burns; check colour and characteristics of burnt tissue
 - estimate depth (see table below) and percentage of burns (over page)
 - look for other injuries

Burns > 10% body surface area will require aggressive intervention to prevent circulatory collapse

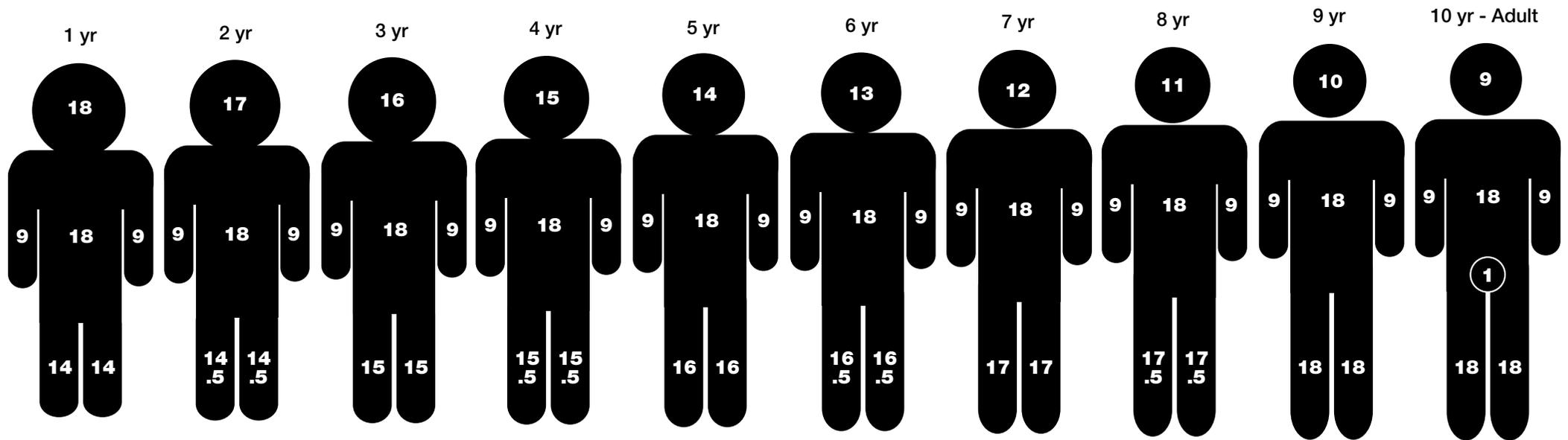
Depth of burns	Colour and appearance	Skin texture	Capillary refill	Pinprick sensation	Healing
Superficial	Red	Normal	Yes	Yes	No scar 5–10 days
Partial thickness	Red – may be blistered	Oedematous	Yes	Yes	10–21 days no/min. scar
Deep partial thickness	Pink – white	Thick	Possible	Possible	25–60 days dense scar
Full thickness	White/black	Leathery	No	No	No spontaneous healing

Burns assessment

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Paediatric-Adult burns assessment ruler

Expressed as a % of Total Body Surface Area



Chest + Abdomen = 18% front or 18% back

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Limbs are measured circumferentially

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Croup and epiglottitis (adult & paediatric)

page 1 of 2 Version: 5 Reviewed: November 2016

Differentiation between croup and epiglottitis

	Croup	Epiglottitis
Age	3 months to 6 years	Any age
Season	Autumn to Winter	None specific
Time of day	Night to early morning	Throughout day
Clinical findings	Slow onset	Rapid onset
Appearance/position	Usually well looking/variable position	Toxic and unwell/sitting – ‘tripod’ position; often pale
Upper respiratory infection	Yes – viral prone	Rare
Fever	Moderate fever < 38 °C	High fever > 38.5 °C
Stridor	Usually inspiratory	Low pitched expiratory (often snoring)/severe stridor
Cough	Barking, seal-like quality	Minimal or absent
Sore throat/speech	Variable/hoarse voice	Yes/unable to speak
Secretions	Able to swallow	Unable to swallow, drooling of saliva

Note: Each of these clinical signs in isolation is a poor discriminator therefore the total clinical picture should be obtained. Remember some children may present atypically.

Obtain full history including onset and any preceding URTI.

General management

- Allow child to take position of comfort.
- Maintain calm environment.
- Avoid distressing procedures.
- Keep child close to parent/s at all times – nurse child on parent’s lap if appropriate.
- Vital signs as tolerated – do not cause any undue distress.
- Reassure child and parents.

Croup and epiglottitis (adult & paediatric)

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Epiglottitis

- **Do not** inspect the airway
- **Do not** lay child supine
- **Do not** perform unnecessary procedures
- These can cause airway spasm/complete obstruction

Arrange transfer/medical review ASAP

- Observe child continuously

* If child is Hib immunised then it is rare that they will have epiglottitis.

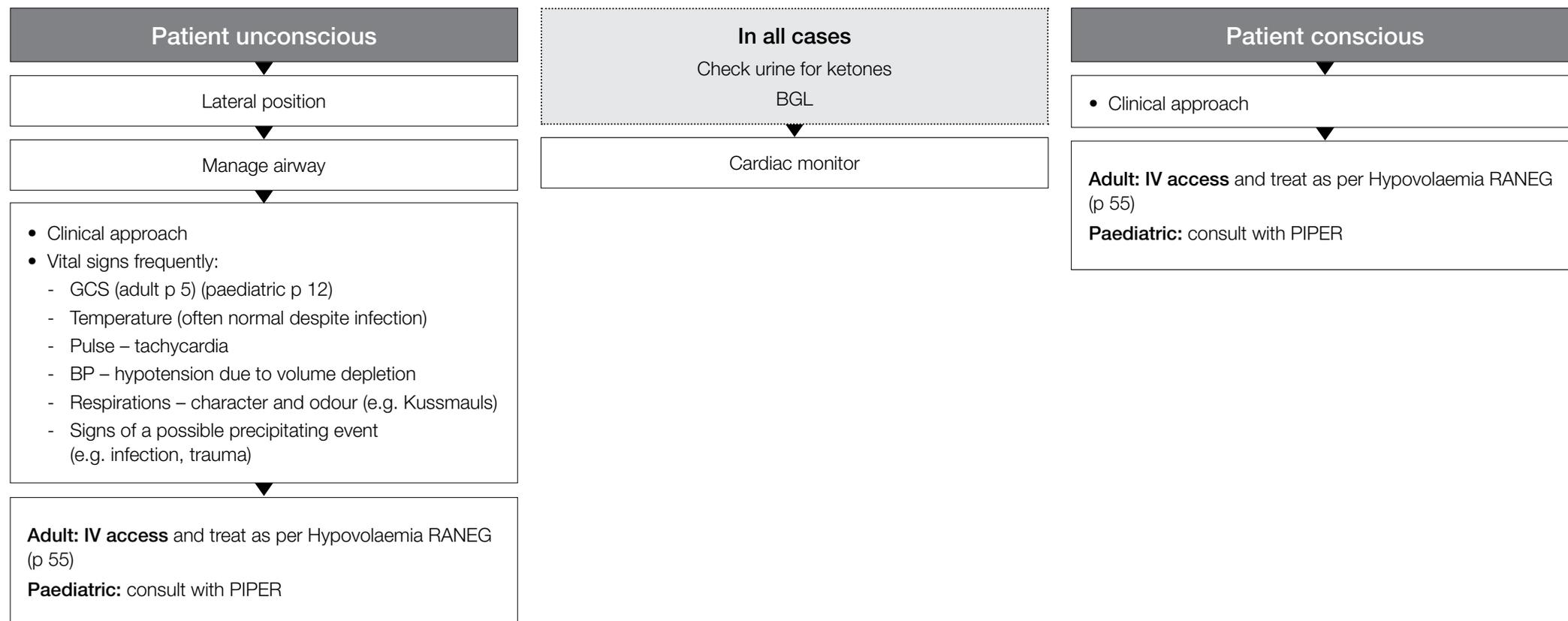
Special notes: Oral prednisolone is best given as soon as practicable in all cases – allows for corticosteroid effects to take effect. Nebulised adrenaline is given as a priority in severe croup.

Croup

Symptoms	Severe	Moderate	Mild
Conscious state	Agitated, distressed or lethargic (tired child); decreased conscious state	Can be placated; interactive with surroundings not particularly distressed or anxious looking	Alert and comfortable
Chest wall (intercostal) retraction	Yes – marked use of accessory muscles	Yes – some tracheal tug and chest wall retraction	Nil (intercostal) retraction
Breath sounds	Significantly decreased	Normal or mildly decreased	Normal
Stridor	Initially audible now decreasing in intensity	Persistent stridor at rest; easily audible	No stridor at rest
Cyanosis	Yes	Nil	Nil
SpO ₂	< 92% on air	< 95% on air	
Management	Severe	Moderate	Mild
Vital signs	Assess condition 5 minutely	As tolerated; monitor closely – may progress rapidly to severe	As necessary
Oxygen	Yes	Yes	No
Prednisolone	Prednisolone 1 mg/kg oral (p 151)	Prednisolone 1 mg/kg oral (p 151)	No
Adrenaline (nebulised)	**Priority** adrenaline (1:1000) 5 mg (5 mL) nebulised (p 126) if relapse or no improvement – continue/recommence adrenaline nebulised	Consider adrenaline (1:1000) 5mg (5mL) nebulised (p 126) if not improved after 30 mins post Prednisolone administration	No
Transfer	Yes	Yes	Reassure; transfer if required for Dr assessment and review

Hyperglycaemia – ketoacidosis (adult & paediatric)

Version: 2 Reviewed: November 2016



Hyperthermia (environmental)/heat stress (adult & paediatric)

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Special notes

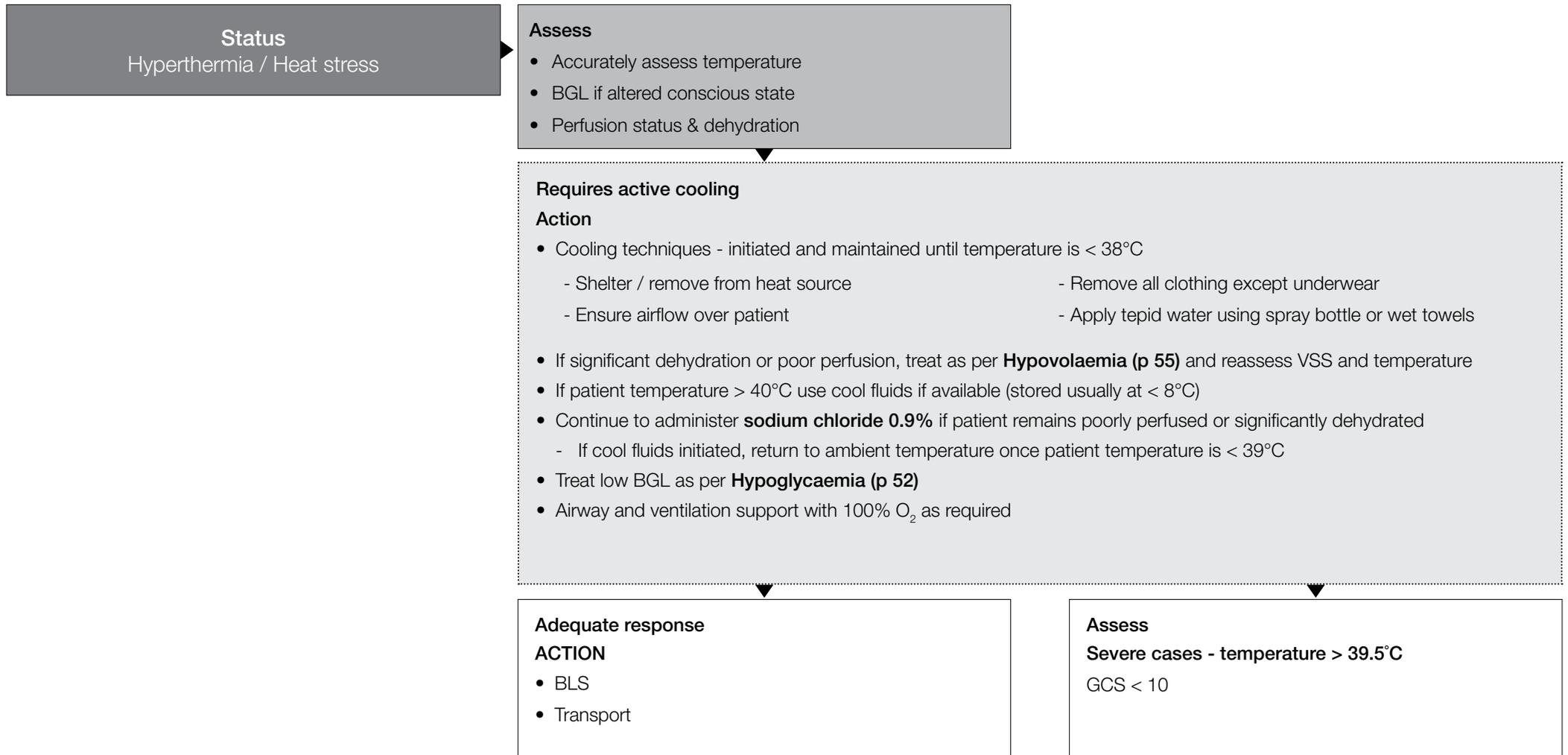
- Patient body temperatures of $< 40^{\circ}\text{C}$, can normally be managed with basic cooling techniques alone.
- Be wary of fluid volumes in renal dialysis patients causing fluid overload. Administer judicious increments with volumes not usually exceeding 10 mL/kg.
- This RANEG is not intended for the management the febrile patient due to infection.

General care

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

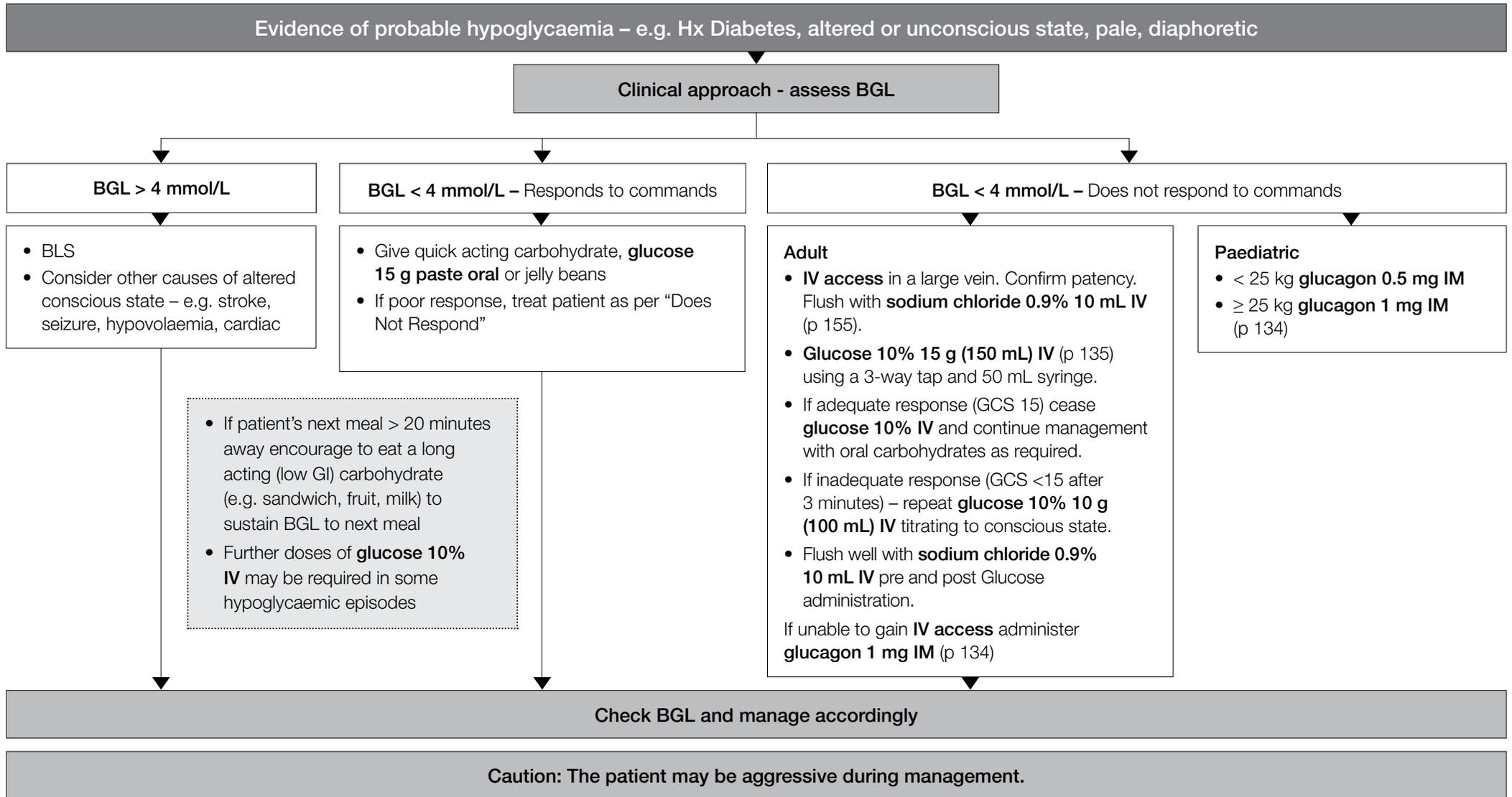
Hyperthermia (environmental)/heat stress (adult & paediatric)

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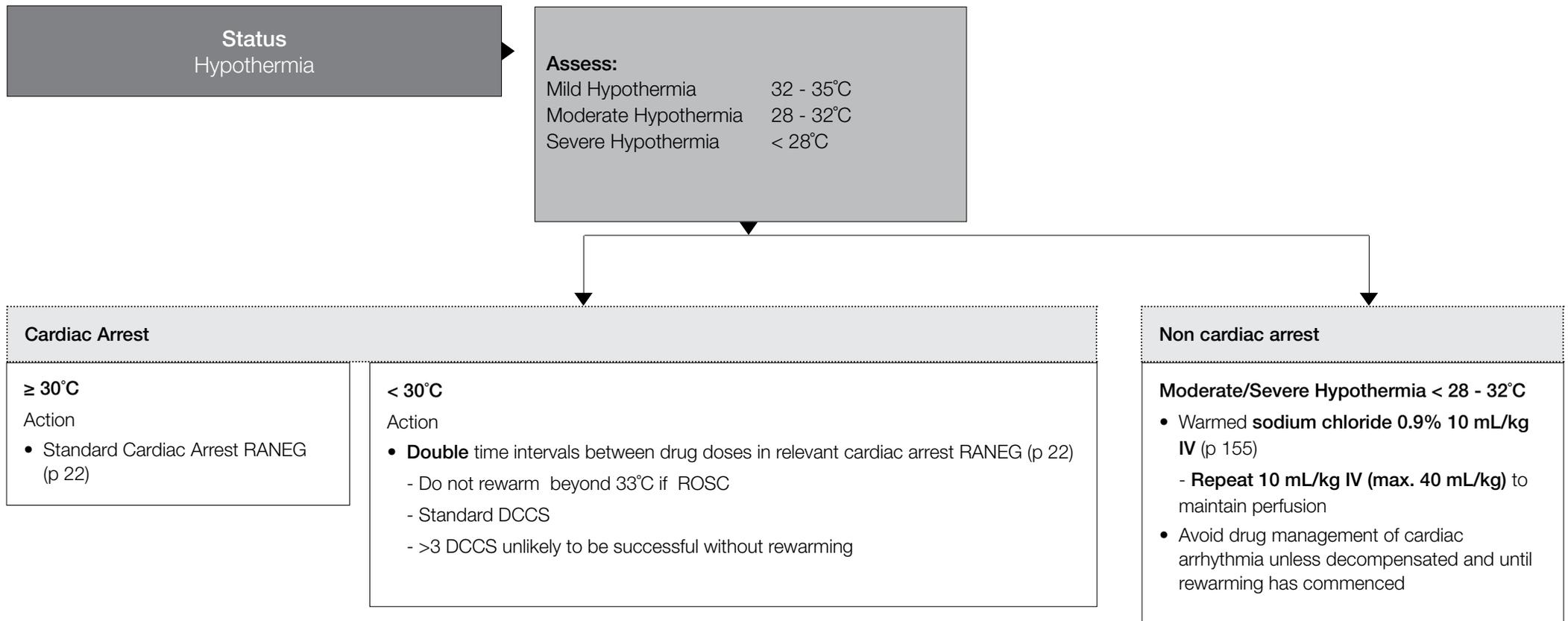
Hypoglycaemia (adult & paediatric)

Version: 6 Reviewed: December 2018



Hypothermia/cold exposure (adult & paediatric)

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Hypothermia/cold exposure (adult & paediatric)

page 2 of 2 Version: 6 Reviewed: December 2018

Special notes

- Hypothermia is insidious and rarely occurs in isolation. Where the patient is in a group environment other members of the group should be carefully assessed for signs of hypothermia.
- Arrhythmia in hypothermia is associated with temperature 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 temperature 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 patient is essential.

General care

- Shelter patient from wind or consider moving into warmer environment.
- Remove all damp or wet clothing.
- Gently dry patient with towels / blankets.
- Cocoon-wrap in bed sheet/space blanket/blanket (thermal wrap).
- Cover head with towel, blanket or beanie.
- Zip patient in 'body bag' with an insulated bottom layer or sleeping bag if available.
- Use hot water bottles or chemically activated warming blanket if available.
- Assess BGL if altered conscious state.
- Only warm frostbite if no chance of refreezing prior to arrival at hospital.

Warmed fluid

- **Sodium chloride 0.9%** warmed to normothermic should be given to correct moderate / severe hypothermia and maintain perfusion if available. Fluid < 37°C could be detrimental to patient.

Hypovolaemia (adult & paediatric)

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Special notes

- Titrate fluid administration to patient response
- Adult - Aim for HR < 100, SBP > 100 if VSS altered (non haemorrhagic)
- Paediatric – to improve SBP appropriate for age
- Always consider tension pneumothorax, particularly in the patient 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
- Clinical signs of significant dehydration include:
 - Postural perfusion changes including tachycardia, hypotension or dizziness
 - Decreased sweating and urination
 - Poor skin turgor, dry mouth, dry tongue
 - Fatigue and altered consciousness
 - Evidence of poor fluid intake compared to fluid loss
- Dehydration in the hyperglycaemic patient should be managed under this RANEG

Haemorrhagic Hypovolaemia

- DOES NOT apply to Paediatrics. Treat as per Hypovolaemia. In penetrating trunk injury or uncontrolled haemorrhage accept carotid pulse and consult with PIPER.
- Adults: Haemorrhagic hypovolaemia applies to patients with blunt/penetrating trauma, suspected ruptured AAA, massive GIT haemorrhage, and pregnant trauma patients
- DOES NOT apply to patients with TBI, isolated SCI, APH or PPH. Manage inadequate perfusion as per the relevant RANEG for these conditions
- For APH associated with major trauma, consult with PIPER

Modifying factors

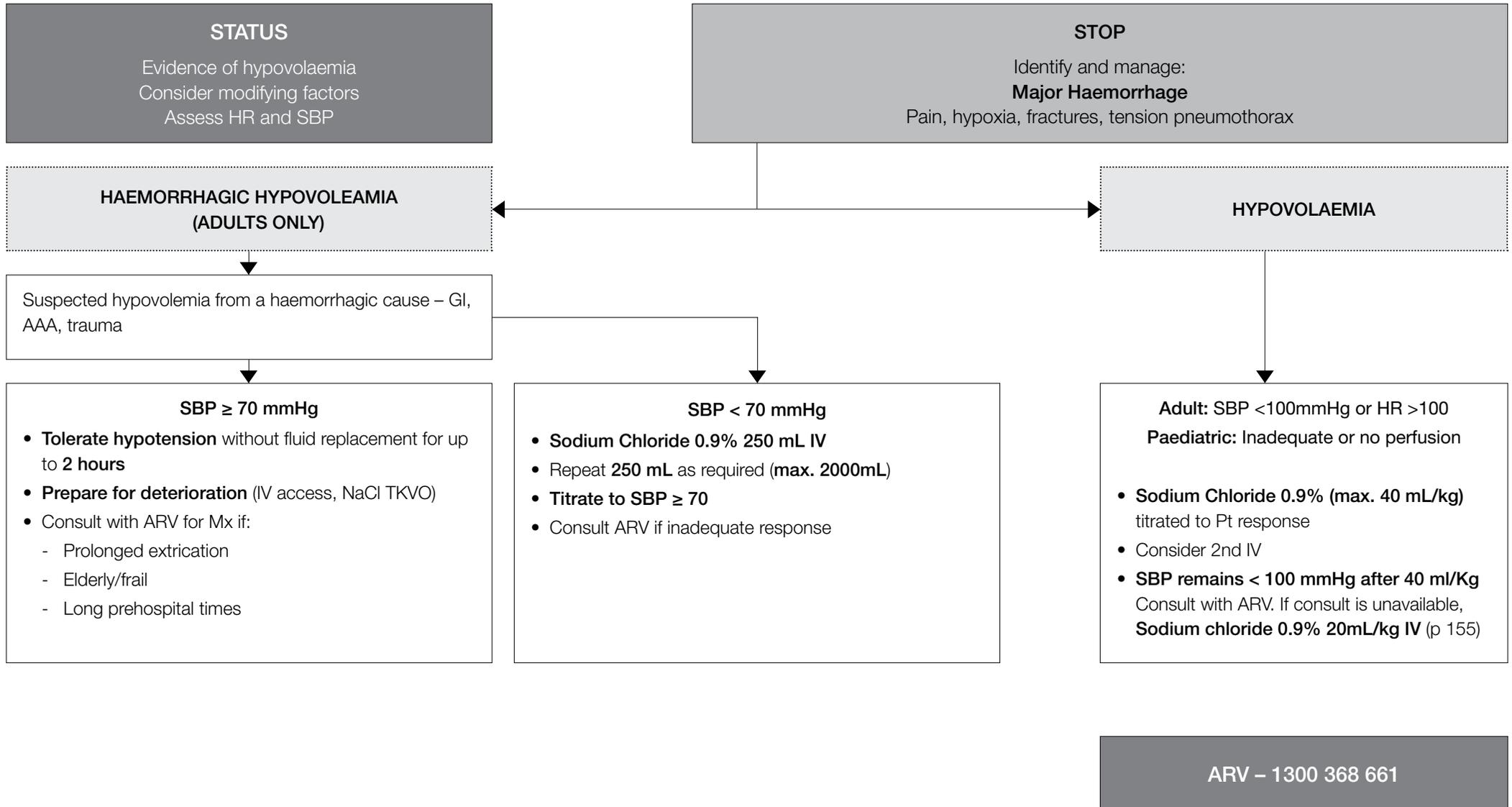
- Isolated spinal cord transection Rx:
 - Adult – isolated neurogenic shock with SBP < 90 can be given **Sodium Chloride 0.9 % 10 mL/kg IV** (p 155) to correct hypotension
 - Paediatric – up to 5 mL/kg **Sodium Chloride 0.9 % IV**
- Cardiac Arrest & ROSC – Max. 20 mL/kg **Sodium Chloride 0.9 % IV**. Consult ARV after 20 mL/kg
- Dehydration in adults - Adequate perfusion but significant dehydration: Consider **Sodium Chloride 0.9 % 20 mL/kg IV** over 30 minutes
- Chest injury – Consider tension pneumothorax (p 88)
- TBI – Aim is for SBP of > 120 mmHg
- APH - treat as per Antepartum haemorrhage and threatened abortion RANEG (p62)
- PPH - treat as per Postpartum haemorrhage RANEG (p67)

General Care

- Identify and manage major haemorrhage as a priority
- A BP can be difficult to ascertain accurately in critically ill patients. Patients with a BP < 70 mmHg will often present with absent radial pulses and decreased alertness. It may be appropriate to combine these assessments with the use of BP, especially where BP is thought to be inaccurate or cannot be taken
- Where the patient is not alert but has a BP ≥ 70 mmHg/ radial pulse present, consider other causes of altered conscious state (e.g. TBI, ETOH, OD, hypoglycaemia dementia)
- Blood products are the preferred resuscitation fluid and, where possible, should be considered in preference to normal saline (e.g. AAV)

Hypovolaemia (adult & paediatric)

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Meningococcal septicaemia (adult & paediatric)

Version: 5 Reviewed: December 2018

Clinical approach/PPE
Expose fully to examine for rash

Suspected meningococcal septicaemia

- Typical purpuric rash (may also be pin prick or petechial 'rash')
- Rash will be non-blanching. Glass object can be pushed against the rash to test.
- Signs of sepsis
 - Fever, rigors, joint and muscle pain
 - Cold hands and feet
 - Tachycardia, hypotension
 - Tachypnoea
- Meningeal signs
 - Headache, photophobia, neck stiffness
 - Nausea and vomiting
 - Altered consciousness
 - Irritable or whimpering (child)

Evidence present

- **Ceftriaxone (p 130).**
- **Adult – ceftriaxone 1 gm IV (dilute with 10 mL water for injection and administer over approximately 2 minutes)**
If unable to obtain **IV access** dilute **ceftriaxone 1 gm with 3.5 mL 1% lignocaine HCl (p 139) made up to 4ml and administer IM**
- **Paediatric – Dilute ceftriaxone 1 gm with 3.5 mL 1% lignocaine HCl made up to 4ml and administer 50 mg/kg (max 1 gm) IM into upper lateral thigh**

Evidence not present

- Manage symptomatically
- Observe closely as patient can deteriorate rapidly

Prompt diagnosis and early administration of antibiotics can be life saving in these cases.

Meningococcal septicaemia assessment

Version: 4 Reviewed: December 2018

Meningococcal disease is a rare but serious illness usually presenting as meningitis or meningococcal septicaemia. There is a peak incidence in winter and spring.

Most at risk from meningococcal septicaemia are those < five years and between 15–24 years.

Triage assessment

- DRABCD
- Assess:
 - GCS (adult p 5) (paediatric p 12)
 - presence of rash – initially pale blotchy skin which may progress to a pin prick, petechial or purpuric non blanching rash.
 - a non blanching rash can be tested with a transparent glass object (eg. a drinking glass). The rash will not fade or disappear when the object is pressed against it.

Subjective assessment

In children and adults:

- associated history – close contact with suspected cases; acute onset
- presenting symptoms:
 - fever, pallor, rigors, sweats
 - headache, neck stiffness, photophobia, backache, cranial nerve palsy
 - vomiting and/or nausea, and sometimes diarrhoea
 - lethargy
 - arthralgia, myalgia; difficulty walking

Objective assessment

- GCS – drowsiness, irritability, confusion, agitation, seizures or altered conscious state, moaning, unintelligible speech
- perfusion status poor.

Absence of a rash does not exclude meningococcal disease.

- In infants and young children the following may also occur:
 - irritability
 - tiredness, floppiness, drowsiness
 - twitching or convulsions
 - grunting or moaning
 - photophobia.

Note in particular:

- rapid deterioration in clinical condition
- repeat presentations to surgery/hospital
- normally calm friends/relatives who are more worried than symptoms apparently justify.

Control of contacts

The risk of meningococcal disease in close contacts, while higher than the general population, is still very low.

Early commencement of antibiotics may be required for those who have had close contact with the case seven days prior to onset of symptoms. This includes health professionals who have had close contact during treatment and procedures involving respiratory secretions.

The Communicable Diseases Prevention and Control Unit, Department of Health, is responsible for identification of contacts who required antibiotics.

As meningococcal infection is a **Group A notifiable disease**, notification to the Department of Health must be made immediately by phone or fax by the treating doctor.

The RAN may also make notification by calling **1300 651 160**.

Obstetrics – emergency birth

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Birth is not a sterile procedure therefore it is not necessary to drape the woman's perineum; however, a clean area is useful.

A birth pack should consist of the following equipment:

- umbilical cord clamps x 2
- sterile disposable metal scissors
- sterile disposable metal clamps x 2
- suction catheter – size 10
- underpad
- pads (mother)
- name bands x 2 (baby)
- gloves
- protective gown
- faceshield (or goggles and mask)
- biohazard bags x 2
- plastic container (for placenta)
- plastic zip-lock bags and woollen hat (to maintain temperature for the management of preterm babies).
- copy of emergency childbirth flowchart, APGAR form and transfer forms (from *Emergency birthing framework*).

In addition you will need:

- linen (baby), towels and blankets
- nappy or towel to dry baby
- syringes (2 mL x 1) and needles (19G blunt and 23/25 G) for maternal drugs.

Imminent birth

- Put on gloves and faceshield/mask and goggles.
- Allow the woman to assume a position of choice.

- Provide analgesia if required - Note: opioid analgesics are C/I in late second stage labour
- Swabbing is not necessary, but in the event that maternal faeces have contaminated the perineum, you may like to wipe down with a pad that is supplied in the pack.
Warm tap water can be used to moisten pads if required.
- The head will normally advance with each contraction.
- If the head is birthing too fast, encourage the mother to pant and slow the process down. Encourage the mother to breathe with an open mouth (pant) rather than push, this will often decrease the pushing action and the explosive nature of the birth.
- Stand to the side of the woman.
- Place the fingers of your left hand on the baby's head to feel strength of descent of head.
- Apply gentle downward pressure to control/prevent sudden expulsion of the baby's head but do not hold back forcibly.
- Following the birth of the head, insert one or two fingers along the back of the baby's head to check for umbilical cord around the baby's neck:
 - loosely wrapped cord – if the cord is around the neck loosely, it is easy to pull it over the baby's head, checking that it is not wrapped around more than once.
 - tightly wrapped cord – if the cord cannot be easily slipped over the baby's head, two metal clamps are attached to the cord and the cord is cut between the clamps and then the cord is unwound.
- If possible, wait until the next contraction before the birth of the shoulders (this will allow time for the shoulders to internally rotate) unless the cord has been cut.
- With the next contraction place your hands on each side of the head if required to assist birth, exert a gentle downwards traction until the anterior (top) shoulder appears under the symphysis pubis.
- Again, if required to assist birth exert gentle upward pressure facilitating the birth of the posterior (lower) shoulder. The body should then follow quickly aided with a gentle push from the woman if necessary.

- It is important that the newborn is supported as it emerges.
- Place the newborn as close as possible to the mother (skin to skin) and cover with wrap to avoid unnecessary heat loss. The baby should begin to respond to this stimulus and take a breath.
- Note time of birth and document.
- Check the baby's HR (> 100).

*HR is the best indicator for adequate ventilation and most important indicator for resuscitation.

Note: Routine intrapartum oropharyngeal and nasopharyngeal suctioning for infants born with meconium-stained amniotic fluid is no longer recommended.

Remember: In a normal birth:

- the baby will arrive (present) headfirst
- the face will be facing towards the mother's anus
- the mother may pass faeces when starting to push
- the baby will be a bluish colour at birth

Obstetrics – emergency birth

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Birth of baby

- **Note time of birth**
- Assess baby – Is the baby moving/crying?

Vigorous → see routine care

Non-vigorous → provide resuscitation.

Refer to **Newborn resuscitation** (p 23) and **Newborn basic life support** (p 24)

Routine care

1. Standard precautions/warm environment.
2. Place baby on the mother's abdomen or chest (skin to skin) and cover with wrap/warm blankets to keep warm. Maintain normothermia (36.5–37.2 °C per axilla). If available place a woollen hat on the newborn's head to maintain warmth.
3. Provide tactile stimulation and warmth by drying thoroughly with soft cloth. The baby should respond to this stimulus and take a breath.
4. Encourage breast feeding to help the uterus contract.
5. Wait for cord to stop pulsating. Clamp and cut cord (apply two metal clamps and cut between).
 - Leave at least 10 cm between the baby's skin and first clamp and 5 cm between the first and second clamp.
 - Ensure clamps are closed properly.
 - Cut the cord between the two clamps and leave in place (involve support person).
6. Assess and record APGAR (p 65) at 1 and 5 minutes (and if required 5 minutely thereafter until > 7).

Birth of placenta

- Do not pull on cord, await signs of separation.
- Check uterus for another baby – check the level of the mother's uterus (top should be no higher than mother's umbilicus and it should be firm).
- If no signs of active bleeding or separation there may be no need to birth the placenta.
- Signs of normal separation of the placenta will generally occur, these may include:
 - slight gush of blood
 - lengthening of the cord, or
 - the placenta will become visible at the opening of the vagina and then can be birthed.
- Place the placenta in plastic container/biohazard bag ready for transfer.
- If placental separation occurs naturally (note this may take up to one hour):
 - Wait for signs of separation.
 - Placenta and membranes are birthed by maternal effort. Ask the mother to give a push.
 - Maternal positioning such as squatting or sitting by using the forces of gravity will aid expulsion.
 - Breastfeeding or nipple stimulation may assist separation or expulsion of placenta.

Newborn normal physiological parameters

- **Weight:** Average full term weight = 3.5 kg
- **Normal blood volume:** 80 mL/kg
- **Heart rate:** (assess with stethoscope over apex of heart). 110–170 bpm
- **Respiration:** 25–60 bpm
- **Skin:** Colour – usually dusky and peripherally cyanosed initially. It may take 7 to 10 minutes post birth for SpO₂ to reach > 90% and for colour to become pink in a term baby
- **Conscious state:** Active motion, grimace and/or crying
- **Temperature:** 36.5–37.2 °C per axilla

Note: Newborns lose heat via the large surface area of their head and by evaporation from their wet body once outside the uterus.

Obstetrics – emergency birth

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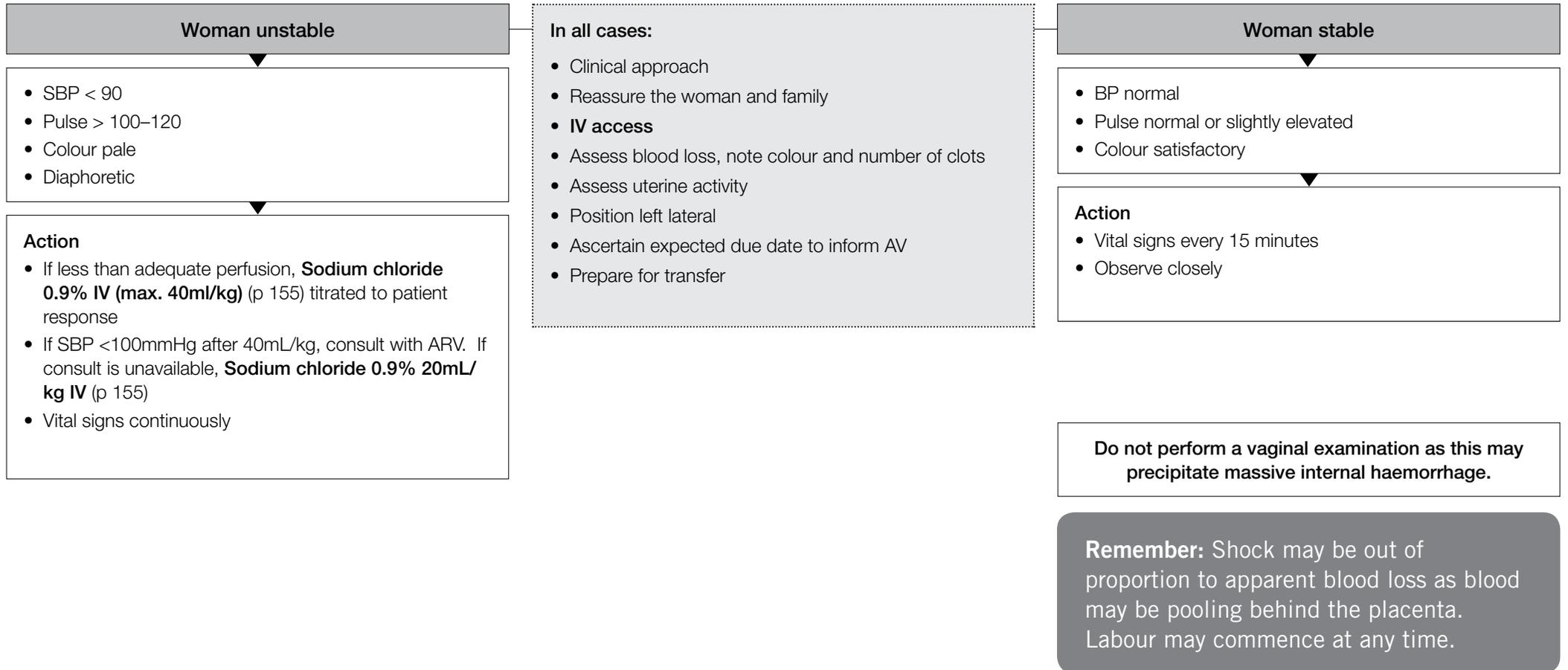
After care

- Ensure the mother and baby are warm; precipitate labours and birth often result in shock for the mother. (The bubble wrap around the equipment bundle may be used to wrap the baby in to keep it warm.)
- Record maternal and baby observations including:
 - mother – temperature, pulse, BP, state of perineum, uterus (fundus) (palpate abdomen to see if firm or soft) and blood loss (need to do maternal observations every 15 minutes for the first hour)
 - baby – colour, temperature, respirations, heart rate and cord (check clamp and for bleeding)
 - other documented times that are beneficial are:
 - time of birth
 - time of birth of placenta
- If not already done, contact referral hospital for advice on transfer
- If not already done, contact AV for transfer advice
- Ensure a copy of all documentation accompanies the mother and baby for transfer
- Ensure that the placenta, (if birthed) is in a container and bagged and labelled for transfer

Note: If actively bleeding (more than 500 mL) or if the mother exhibits signs of shock refer to **Postpartum haemorrhage (PPH)** (p 67).

Antepartum haemorrhage and threatened abortion

Version: 4 Reviewed: December 2015



Antepartum haemorrhage assessment

Version: 3 Reviewed: December 2015

Triage assessment

- Assess:
 - skin colour
 - GCS (Adult p 5)
 - sweating
 - anxiety

Subjective assessment

- Events leading to admission:
 - pain continuous or intermittent
 - trauma, for example, recent fall/car accident
- Obstetric history:
 - estimated due date
 - antenatal history – ask woman or family for details
 - complications
- Medical history
 - hypertension
 - clotting defects
 - blood group if known

Objective assessment

- Check:
 - vital signs
 - pain: location, nature and severity

Important:

- If BP > 140/90, assess for oedema of face, sacrum, ankles, fingers
- Check uterine activity for onset of labour
- Do not palpate the abdomen
- Estimate amount of bleeding
- Do not perform a vaginal examination, as this may precipitate massive maternal haemorrhage
- Transfer blood stained pads etc. with patient to allow better establishment of blood loss

Cord prolapse assessment

Version: 3 Reviewed: December 2015

- Assess:
 - estimated due date
 - vital signs of mother
 - colour of amniotic fluid
 - onset of labour – time/date
 - obstetric history as per emergency birth

Key points

- Keep cord handling to a minimum as this can lead to spasm or contraction of umbilical vessels.
- Early diagnosis and prompt treatment are effective in reducing the perinatal mortality rate.
- Remove/prevent pressure on cord from presenting part using described position.
- Reassure the woman regarding baby's condition.
- **Keep cord warm and moist** (replace in vagina if possible).

Urgent action

- Clinical approach.
- Wash hands and use sterile gloves.
- Gently replace cord in vagina.
- Position woman kneeling (head down, bottom up).
- Insert hand into vagina. Apply pressure to presenting part (head) to avoid compression of cord.
- Prepare for urgent transfer.

Cord prolapse is usually associated with an unstable lie or malpresentation.
Caesarean section is the preferred mode of delivery.

Emergency birth assessment and APGAR

page 1 of 2 Version: 3 Reviewed: December 2015

Maternal

Triage assessment

- Assess:
 - emotional status of mother
 - imminent birth evidenced by urge to push accompanied by bulging perineum
 - obvious rupture of membranes (soaked clothes) – check colour of amniotic fluid

Subjective assessment

- Assess current status:
 - time of onset of labour
 - frequency, duration, strength of contractions
 - membranes intact or ruptured
 - urge to push
- Take obstetric history:
 - number of pregnancies
 - number of live births
 - estimated due date
 - antenatal care
 - complications during pregnancy – medical or obstetric
 - medication and allergies
 - previous obstetric and/or gynaecological history
 - previous medical history
 - blood group if known

Objective assessment

- Vital signs:
 - maternal blood pressure, pulse, respirations
 - foetal heart rate
 - vaginal loss
- Assess stage of labour:
 - abdominal examination
 - frequency, duration, strength of contractions
 - character and amount of vaginal discharge, such as show or liquor
 - involuntary pushing
 - bulging perineum
 - appearance of presenting foetal part

Post delivery

- Refer to after care (p 59).
- Refer to Postpartum haemorrhage (p 67).

Emergency birth assessment and APGAR

page 2 of 2 Version: 3 Reviewed: December 2015

Newborn

General concept: The primary focus is to establish and maintain effective ventilation and preventing hypothermia.

Normal neonatal transition includes:

- lungs change from fluid filled to air
- pulmonary blood flow increases
- intra and extra cardiac shunts initially reverse then close
- relatively large airways pressures are required to open alveoli and begin to breathe air.

Vigorous babies are very effective at clearing their own airway and establishing adequate breathing. Non-vigorous babies may require some assistance such as:

- airway clearance
- tactile stimulus
- IPPV
- CPR
- adrenaline
- IV fluid

The level, sequence and timing of resuscitation efforts need to be based on what is normal for post-birth transitioning.

1. Breathing is assessed by HR (this is the best indicator of adequate ventilation)
2. Chest movement (retractive breathing and /or persistent apnoea requires ventilatory assistance)
3. Centrally pink and peripherally cyanosed is normal, but if this persists > 7–10 minutes administer supplemental O₂ until pink

Refer to Newborn resuscitation (p 23)

APGAR scoring system

The APGAR score should be conducted 1 minute after birth and repeated at 5 minutes after birth. A score of:

- 7–10 is considered satisfactory.
- 4–6 has moderate depression and may need respiratory support.
- 0–3 indicates a newborn requiring resuscitation.

APGAR sign	Score 2	Score 1	Score 0
Appearance (skin colour)	Normal colour all over (hands and feet pink)	Normal colour (but hands and feet bluish)	Bluish-grey or pale all over
Pulse (HR)	> 100 bpm (normal)	< 100 bpm	Absent (no pulse)
Grimace (responsiveness or 'reflex irritability')	Pulls away, sneezes or coughs with stimulation	Facial movement only (grimace) with stimulation	Absent (no response to stimulation)
Activity (muscle tone)	Active, spontaneous movement	Arms and legs flexed with little movement	No movement (floppy tone)
Respiratory effort	Normal rate and effort	Slow or irregular breathing	Absent (no breathing)

Consider: liaising with the AV clinician for guidance

Postpartum haemorrhage

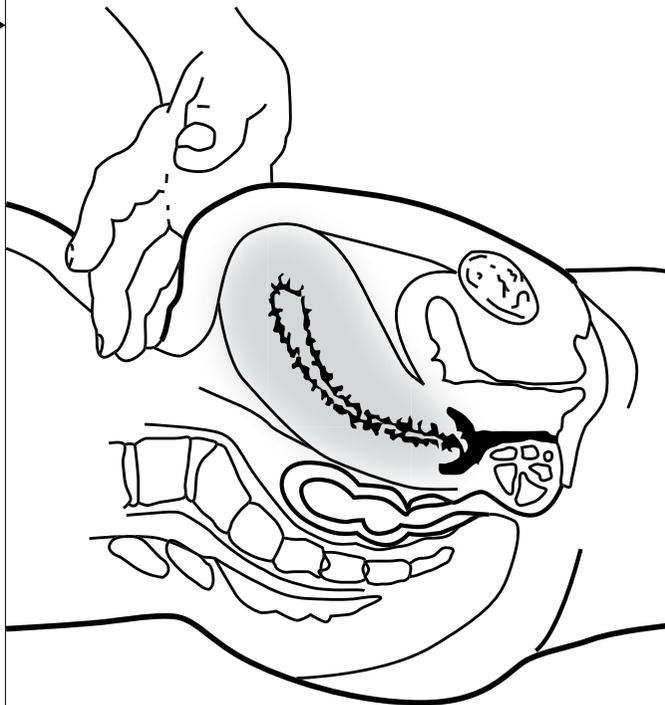
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A PPH is said to have occurred if blood loss exceeds 500 mLs (PPH can occur before or after the birth of the placenta)
Actions depend on the vital signs

Placenta not birthed

- Clinical approach
- Palpate Abdomen for any undelivered twins
- **Oxytocin 10 IU IM** (p 149)
- Check if the uterus is firm and contracted:
 - if contracted look for other signs of bleeding, such as cervical, perineal or vaginal lacerations; pack vagina if laceration evident and record number of packs in situ
 - if not contracted, massage uterus to encourage contraction
- Insert IDC
- If placenta visible at vulva, gently remove
- BP <90mmHg:
 - consider **Sodium chloride 0.9% IV (max 40mL/kg)** (p 155) titrated to patient response
 - Consult ARV for further fluid. If consult unavailable repeat **Sodium chloride 0.9% 20mL/kg IV** (p 155)
- If bleeding continuing, repeat **oxytocin 10 IU IM** (p 149)
- Continue to massage uterus
- Establish total blood loss

Figure 6: Massage uterus



Placenta birthed

- Clinical approach
- **Oxytocin 10 IU IM** (p 149)
- Check if the uterus is firm and contracted:
 - if contracted look for other signs of bleeding, such as cervical, perineal or vaginal lacerations; pack vagina if laceration evident and record number of packs in situ
 - if not contracted, massage uterus to encourage contraction
- Insert IDC
- Treat symptoms of blood loss:
 - **sodium chloride 0.9% 20 mL/kg IV** (p 155) and reassess. If woman remains hypotensive repeat as per hypovolaemia RANEG (p 55)
- If bleeding continues, repeat **oxytocin 10 IU IM** (p 149)
- Continue to massage uterus
- Establish total blood loss
- Ensure placenta and membranes accompany woman

Postpartum haemorrhage assessment

Version: 3 | Reviewed: December 2015

Triage assessment

- Check:
 - skin colour
 - GCS (adult p 5) (paediatric p 12)
 - sweating
 - anxiety

Subjective assessment

- Obstetric history:
 - date and time of birth
 - type of birth
- Normal
- Forceps
- Caesarean section
 - if recent (in last hour or two), has the placenta birthed?
 - pregnancy complications
- Medical history:
 - hypertension
 - diabetes, etc.
- Assess emotional state:
 - whereabouts of baby?
 - place in care of family if available

Objective assessment

- Check vital signs
- Assess bladder status:
 - empty if necessary, promotes separation and delivery of placenta if it is still in situ
- Assess placenta:
 - has it birthed?
 - examine placenta for completeness; note any missing cotyledons
- Assess state of uterine fundus
 - relaxed
 - contracted
- Estimate and save all blood loss/clots etc.
- Vaginal examination:
 - consider lacerated cervix, vaginal wall
- Perineal status

Remember: An empty contracted uterus does not bleed in the absence of coagulopathy.

Oxygen use in emergency presentations (adult)

page 1 of 2 Version: 4 Reviewed: December 2018

This RANEG is only applicable to patients ≥ 12 years. For patients < 12 years clinical judgement should be exercised.

Evidence of hypoxaemia or breathlessness

Patient assessment:

- Acute or chronic
- Respiratory status
- Perfusion status
- Assess & monitor SpO₂ continuously
- Consider causes of hypoxaemia

Moderate – severe hypoxaemia

Mild – moderate hypoxaemia

Adequate

Chronic hypoxaemia

SpO₂ < 85%

OR

Critical illnesses (Regardless of SpO₂)

- Cardiac arrest or resuscitation
- Major trauma/head Injury
- Carbon monoxide poisoning
- Shock
- Severe sepsis
- Anaphylaxis
- Decompression illness
- status epilepticus

SpO₂ 85 – 91%

SpO₂ $\geq 92\%$

SpO₂ 88 – 92%

Chronic hypoxaemia

- COPD/pulmonary disease
- Morbid obesity
- Bronchiectasis
- Neuromuscular disorders
- Cystic Fibrosis
- Severe kyphoscoliosis

High concentration O₂ may be harmful in the COPD patient at risk of hypercapnic respiratory failure.

Action

- Initial management
 - non-rebreather mask 10-15 Lpm
 - simple face mask 5-10 Lpm (if above not available)
 - if inadequate tidal volume consider O₂ 100% via BVM
- Once patient stable
 - titrate O₂ to SpO₂ $\geq 92\%$
- If patient deteriorates or SpO₂ remains < 85%
 - O₂ 100% via BVM
 - Consider LMA

Action

- Titrate O₂ to SpO₂ $\geq 92\%$
 - nasal cannula 2-6 Lpm
 - simple face mask 5-10 Lpm (if above inadequate or not available)

Action

- No O₂ required
- Reassure patient

Action

- Titrate O₂ to SpO₂ 88-92% if no critical illness present
 - nasal cannula 2-6 Lpm
 - simple face mask 5-10 Lpm (if above inadequate or not available)
- If patient deteriorates or SpO₂ remains < 85%
 - treat as per moderate-severe hypoxaemia

Oxygen use in emergency presentations (adult)

page 2 of 2 Version: 4 Reviewed: December 2018

Management principals

- This RANEG is intended for use by RANs where a reliable SpO₂ reading is available.
- Oxygen is a treatment for hypoxaemia, not breathlessness.
- Oxygen should be administered to achieve an adequate or target SpO₂, while continuously monitoring the acutely ill patient.
- Oxygen should not be routinely administered to patients with adequate SpO₂ (including stroke, acute coronary syndromes & arrhythmias).
- In patients presenting acutely short of breath, oxygen administration should be a priority over obtaining a SpO₂.
- 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.
- If pulse oximetry is not available or unreliable, initiate oxygen using clinical judgement until a reliable SpO₂ reading is obtained.

Special circumstances

- Early aggressive oxygen administration may benefit patients who develop critical illnesses and are haemodynamically unstable. In this group of patients aim for SpO₂ 100%. Once the patient is haemodynamically stable, oxygen should be titrated to achieve SpO₂ ≥ 92%.
- Patients with chronic hypoxaemia (e.g. COPD, neuromuscular disorders, morbid obesity) who develop critical illnesses should have the same initial aggressive oxygen administration.
- If a diagnosis of COPD is unknown, it should be assumed in any patient who is > 40 years, a long-term or ex-smoker with a history of chronic breathlessness on minor exertion.
- Pregnant hypoxaemic women (> 20 weeks) should be managed with left lateral tilt to improve cardiac output.
- Patients presenting with anxiety/panic disorders (e.g. hyperventilation syndrome) in general do not require oxygen, however no attempt should be made to retain carbon dioxide (e.g. paper bag breathing).
- All patients suspected of having inhaled potentially toxic gases (e.g. house fires, carbon monoxide poisoning, etc.) should be given high dose O₂ until arrival at hospital. In these clinical situations, patients who show no signs of breathlessness may still benefit from this treatment.
- Where the patient may have been exposed to other poisons, administer O₂ to maintain an SpO₂ of 92- 96%. The National Poisons Centre can be contacted on **13 11 26**.

- Special circumstances occur in the setting of paraquat and bleomycin poisoning where the use of O₂ therapy may prove detrimental to the patient. The maintenance of prophylactic hypoxaemia in these patients (SpO₂ of 85 - 88%) is recommended.
- Patients with medically diagnosed pneumothorax, but without an intercostal catheter in situ, may benefit from high dose O₂ regardless of SpO₂.

Determining oxygen percentages by litres flow					
	Lpm	Nasal cannula	Simple mask	Partial rebreather mask	Non-rebreather mask
Oxygen delivery rate litres/minute	2	23% to 28%	x	x	x
	3	28% to 30%	x	x	x
	4	32% to 36%	x	x	x
	5	40%	40%	x	x
	6	Max 44%	45% to 50%	35%	55% to 60%
	8	x	55% to 60%	45% to 50%	60% to 80%
	10	x	x	60%	80% to 90%
	12	x	x	60%	90%
	15	x	x	60%	90%

X = a concentration cannot be reached with this particular method

Poisoning (adult & paediatric)

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National Poisons Centre
Tel: **131 126**

Suspect overdose/poisoning in all:

- unconscious patients
- patients with unexpected altered level of consciousness
- unusual presentations e.g. seizures, confusion
- multiple patients with same presentation.

STOP:

- Ensure safety/standard precautions/special precautions.
- Beware aggression and hidden sharps
- Avoid self contamination
- Decontaminate patient if possible

Assess

History

1. **What** substance?
2. **How** much?
3. **Which** route?
4. **When** taken/exposed?
5. **Why** – accident/deliberate?

Vital signs

- Baseline and minimum 15 minutely as patient may deteriorate rapidly
- Continuous cardiac and SpO₂ monitoring

Clinical exam

- Head to toe: Look for signs which maybe suggestive of:
 - bruising/puncture marks: **IV drug use**
 - constricted pupils and respiratory depression: **opiate use (caution: consider neurological injury/event)**
 - dilated pupils: **anticholinergics, amphetamines, alcohol**
 - dyskinesia: **many drugs** particularly metoclopramide/chlorpromazine
 - sweating, aggression, confusion: **hypoglycaemia**
 - sores/bleeding around nose: **solvent inhalation**
 - oropharyngeal burns/oedema: **corrosives**

Supportive care: in all cases

1. Clinical approach
2. **If** patient has altered conscious state, assess BGL and manage as per **Hypoglycaemia** RANEG (p 52)
3. **If** patient is inadequately perfused manage as per **Hypovolaemia** RANEG (p 55)
4. **If** altered temperature manage as per **Hypothermia** RANEG (p 53) or **Hyperthermia** RANEG (p 50)
5. **If** seizures, manage as per **Seizures** RANEG (adult p 78) (paediatric p 79)

Poisoning (adult & paediatric)

page 2 of 2 Version: 6 Reviewed: December 2018

Specific care

<p>Narcotics</p> <ul style="list-style-type: none"> • See Naloxone (p 144) 	<p>Organophosphate poisoning</p> <ol style="list-style-type: none"> 1. Avoid self-contamination, wear PPE and minimise staff exposure 2. Where possible, remove contaminated clothing and wash skin thoroughly with soap and water 3. Confirm evidence of suspected poisoning <ul style="list-style-type: none"> • The keyword on label is 'anticholinesterase' (commercial and domestic products) • Look for cholinergic effects which include: Salivation, Sweating, Nausea, Bradycardia and Bronchospasm • ID container generic and trade names and contact: National Poisons Centre: 131 126 4. If salivation compromises airway or bronchospasm and/ or bradycardia with poor perfusion and hypotension: adults: atropine 1200 mcg (1.2 mg) IV every 5 minutes, until excessive cholinergic effects resolve. See Atropine (p 129)
<p>Sedatives</p> <ul style="list-style-type: none"> • Includes: GBH, alcohol, benzodiazepines and volatile agents • Treat symptomatically 	
<p>Psychostimulants</p> <ul style="list-style-type: none"> • Reduce stimuli • Treat symptomatically • Treat Cardiac Chest Pain (p 32). Caution: aspirin contraindicated if SBP > 160 due to risk of stroke 	
<p>Tricyclic Antidepressants</p> <ul style="list-style-type: none"> • Consider the potential to develop toxicity, vigilantly observe for: <ol style="list-style-type: none"> 1. altered conscious state 2. less than adequate perfusion 3. arrhythmias • Management: <ul style="list-style-type: none"> - cardiac monitoring - if GCS < 10 hyperventilate with 100% O2 at rate of 20–24/min 	

Treat the patient not the poison

Respiratory distress (adult)

Version: 4 Reviewed: December 2018

Possible causes:

<p>Respiratory</p> <ul style="list-style-type: none"> • Pneumothorax • Asthma • Anxiety/hyperventilation • Chest infection • Inhaled foreign body • Smoke inhalation • Anaphylaxis 	<p>Cardiac</p> <ul style="list-style-type: none"> • Left ventricular failure • Pulmonary oedema • Pulmonary embolus • Arrhythmia • Tamponade • Acute coronary syndrome 	<p>Toxic/metabolic</p> <ul style="list-style-type: none"> • Salicylate poisoning • Diabetic ketoacidosis
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<p>Gross upper airway obstruction stridor, cyanosis, ineffective respiratory effort, +/- history of choking</p> <p>Yes</p> <ul style="list-style-type: none"> • Alternate back blows and chest thrusts if obstruction thought to be cause • Assist ventilation if obstruction unrelieved and respiration ceases (see airway obstruction/choking RANEG p 33) 	<p>Stupor/coma with shallow breathing; no gag, cough reflex</p> <p>Yes</p> <ul style="list-style-type: none"> • Airway/LMA • Assist breathing if required • Vigilant observation
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Special Notes:

- **Furosemide** should be used cautiously in the hypotensive patient
- **Furosemide** is not an appropriate first line treatment in hypertensive patients with a sympathetically driven APO. Nitrates and CPAP should be the first priority
- Where the patient is normotensive or hypertension has been corrected with nitrates, **Furosemide** may be considered where there is evidence of volume overload

In all cases:

- Clinical approach
- Position patient to facilitate breathing
- Obtain history
- Look for:
 - conscious state
 - intercostal retraction
 - use of accessory muscles
 - paradoxical uneven chest movement
 - sweating
 - cyanosis

COPD

Should be suspected in any patient over 40 years old who has:

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

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

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

<p>Acute pulmonary oedema postural dyspnoea, frothy sputum, 'crackles' on auscultation</p> <p>Yes</p> <ul style="list-style-type: none"> • Refer to Acute Pulmonary Oedema (Cardiogenic) Guideline (p 74) 	<p>Severe asthma/COPD</p> <p>Yes</p> <ul style="list-style-type: none"> • See Asthma RANEG (p 37)
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COPD

Irrespective of severity:

- **Salbutamol 10mg** and **Ipratropium Bromide 500 mcg Nebulised**. Single Dose
- **Dexamethasone 8mg IV/IM**
- After initial treatment, titrate O2 flow to target SpO2 88-92%
- If inadequate response after 10 minutes, consult ARV

Acute Pulmonary Oedema (Cardiogenic) (Adult)

page 1 of 2 Version: 2 Reviewed: December 2018

Cardiogenic APO:

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

Non Cardiac APO

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

Special Notes

- **Nitrates** treat the underlying cause of cardiogenic APO and should be administered to all patients presenting in symptomatic **cardiogenic** APO unless contraindicated.
- **CPAP** is an appropriate treatment for respiratory failure associated with APO while the underlying cause is addressed. It may be required in patients unresponsive to nitrates or where respiratory failure is significant enough to require immediate treatment concurrent with nitrates.
- **Furosemide** is not an appropriate first line treatment in hypertensive patients with a sympathetically driven APO. Nitrates and CPAP (when required) should be the initial priority. Where the patient is normotensive or hypertension has been corrected with nitrates, Furosemide may be considered.

Acute Pulmonary Oedema (Cardiogenic) (Adult)

page 2 of 2 Version: 2 Reviewed: December 2018

APO

Is an abnormal pathophysiological state characterised by fluid filled alveolar spaces and interstitium which impairs gas exchange and decreases lung compliance.

CPAP Contraindications

1. GCS < 13
2. Facial trauma
3. Pneumothorax
4. Active vomiting
5. Life threatening arrhythmias
6. The need for a secure airway
7. Hypoventilation

CPAP use via Flow-Safe II Device

- If oral GTN indicated, then ensure administration prior to mask application (p 136)
- SpO2 may initially decrease once high concentration O2 removed
- Portable O2 regulators may have a fixed flow rate of 8 L/min. (PEEP of 5-7 cmH2O). Initiate CPAP at 8 L/min until higher O2 supply is available
- Target PEEP of 10 cmH2O (O2 flow rate of 12-14 L/min)
- Observe patient. SBP may decrease if management effective
- Remove device if contraindications arise
- Remove GTN If SBP falls <110 mmHg (oral) or <90 mmHg (patch)
- If nil improvement after 1 hour, consult ARV

Application of Flow- Safe II device:

- Assemble device and detach harness side clips from mask
- Ensure oxygen flow prior to application on patient (min. 8 L/min)
- Use hand to bunch cheek towards mask
- Place mask in position using other hand, narrow part over bridge of nose
- Manipulate for best fit
- Allow patient to adapt to mask. Provide reassurance
- Apply head harness and adjust as needed

Primary management aims:

- Reverse any hypoxia
- Reduce myocardial oxygen demand
- Increase FiO2
- Reduce patient work of breathing

Consider causes

- Seek evidence of cardiogenic APO
- Complete a Respiratory status assessment (p 7)

No improvement OR Full field APO

- CPAP
- Suction and assisted ventilation if required
- Oxygen therapy if indicated

If patient is normotensive or hypotension has now resolved with evidence of fluid overload:

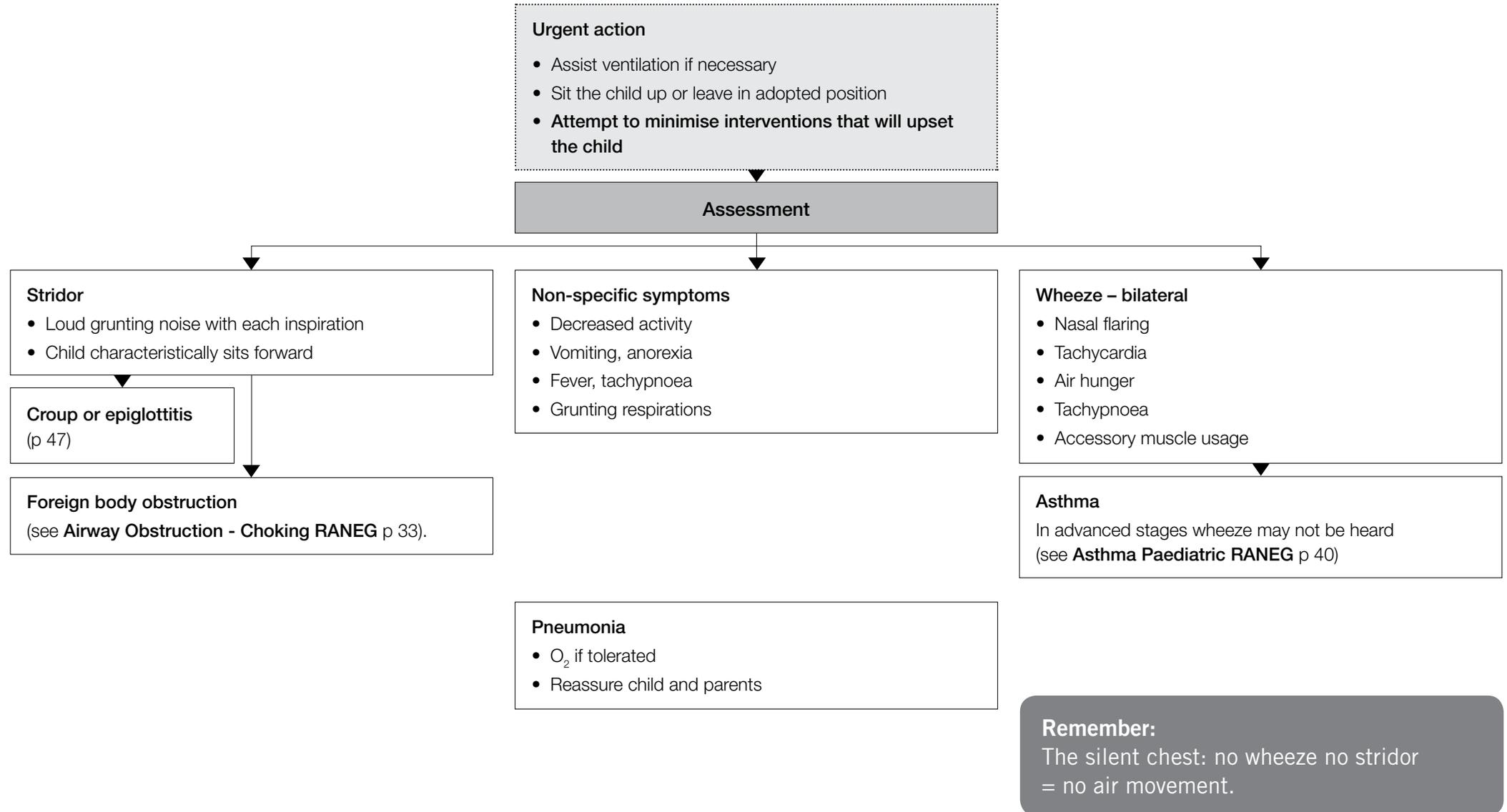
- Consider Furosemide 40mg IV (or patients normal daily dose) (Max 100mg)
- If unable to gain IV access Furosemide 40mg IM (or patients normal daily dose) (max 100mg)

Short of breath and crackles on auscultation

- GTN 600mcg S/L if SBP > 110mmHg
- OR
- GTN 300 mcg S/L if no previous administration, <60kg, elderly or frail.
 - Repeat 300 or 600 mcg S/L @ 5 minute intervals titrated to pain or side effects.
 - Apply GTN Patch 10mg/24hr upper left chest/arm.
 - Remove patch if BP falls <90 mmHg.
 - Oxygen therapy if indicated

Respiratory distress (paediatric)

Version: 3 Reviewed: December 2018



Respiratory distress assessment

Version: 4 Reviewed: December 2018

Triage assessment

- Assess:
 - skin colour: pallor, cyanosis
 - level of consciousness
 - respiratory status:
 - ability to speak
 - ability to cough
 - ability to move air
 - chest shape and movement

Subjective assessment

- Take history of present episode (**treat while assessing**):
 - how long symptoms have been present
 - what the patient was doing when this occurred
 - precipitating factors such as exposure to toxins, allergies, anxiety, URTI
 - is the patient becoming fatigued
 - reason for acute exacerbation
- Assess associated symptoms:
 - cough (describe any sputum)
 - wheezing
 - chest pain
 - pleuritic: sharp pain on inspiration
 - cardiac: crushing central chest pain, may radiate
 - presence of orthopnoea or paroxysmal nocturnal dyspnoea
 - fever, chills
 - ankle oedema

- voice changes
- degree of anxiety
- Determine measures taken to relieve symptoms, such as aspirin, nebuliser, medications
- Medical history:
 - lung or cardiac disease
 - usual level of activity
 - history of smoking
 - medication including PRN medications, herbal and home remedies
 - allergies – history of hayfever/asthma
 - hospitalisations, especially for respiratory disease
 - any other previous illness
 - trauma history
 - family history of asthma and allergies
 - last chest X-ray
- Ask about recent stress, emotional event or illness

Objective assessment

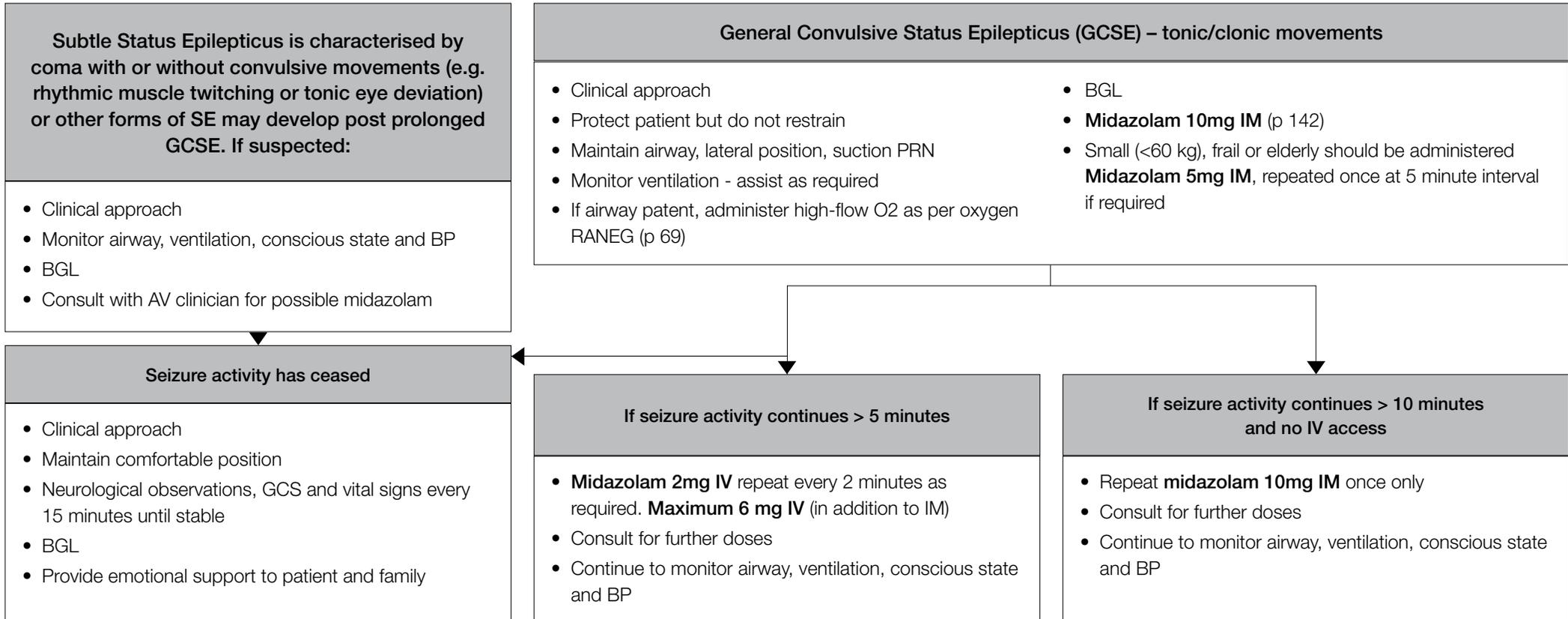
- Vital signs:
 - **Respiratory:** check rate, rhythm and quality of respirations and SpO₂; note also accessory muscle use and intercostal and sternal retractions
 - **Pulse:** tachycardia (bradycardia with children) may indicate hypoxia
 - **Blood pressure:** blood pressure may be normal initially, then may rise slightly; during decompensation blood pressure will fall

- **Temperature:** tympanic or rectal if respiratory rate increased or marked respiratory difficulty present
- **Peak flows:** if patient distressed leave until later
- Check respiratory effort:
 - **Physical examination:**
 - skin colour: cyanosis or pallor of lips or nail beds; note diaphoresis
 - breathing pattern, such as prolonged expiratory phase, use of accessory muscles
 - stridor or audible wheeze
 - tracheal deviation
 - increased anterior posterior diameter ('barrel chest')
 - distended neck veins
 - **Breath sounds:**
 - bilateral comparisons
 - presence or absence of crackles, wheezes
 - palpation: note crepitus
 - **Neurological status:**
 - may be altered because of hypoxia; look for signs of change, such as lethargy, agitation, increased anxiety, confusion or irritability
 - **Signs of external trauma:**
 - bruising
 - injury

Seizures (adult)

Version: 7 Reviewed: December 2018

- Evidence of Status Epilepticus (SE) (\geq 5 minutes of seizure activity or 2 seizures without full recovery of consciousness)
- Consider causes e.g. hypoglycaemia, hypoxia, head trauma, stroke/ICH, electrolyte disturbance, meningitis
- Consider patient's own medication plan and the treatment already given



Consider eclampsia in pregnant patients with no prior seizure history or diagnosed with pre-eclampsia.
 GCSE is life-threatening to both mother and baby and midazolam is indicated. Consult with Paediatric, Infant, Perinatal Emergency Retrieval (PIPER) Tel: 1300 137 650 or through AV clinician

Seizures (paediatric)

Version: 8 Reviewed: December 2018

- Evidence of Status Epilepticus (SE) (≥ 5 minutes of seizure activity or 2 seizures without full recovery of consciousness)
- Consider causes e.g. hypoglycaemia, hypoxia, head trauma, stroke/ICH, electrolyte disturbance, meningitis
- Consider patient's own medication plan and the treatment already given

Subtle Status Epilepticus is characterised by coma with or without convulsive movements (e.g. rhythmic muscle twitching or tonic eye deviation) or other forms of SE may develop post prolonged GCSE. If suspected:

- Clinical approach
- Monitor airway, ventilation, conscious state and BP
- BGL
- Consult with AV clinician for possible Midazolam administration

General Convulsive Status Epilepticus (GCSE) – tonic/clonic movements

<ul style="list-style-type: none"> • Clinical approach • Protect patient but do not restrain • Maintain airway, lateral position, careful suction PRN • Monitor ventilation - assist as required • If airway patent, administer high-flow O2 as per oxygen RANEG (p 69) • BGL 	<ul style="list-style-type: none"> • Medium Child (5-11 years) Midazolam 2.5-5 mg IM • Small Child (1-4 years) Midazolam 2.5 mg IM • Small & Large Infant (<12 months) Midazolam 1 mg IM • Newborn Midazolam 0.5 mg IM
<ul style="list-style-type: none"> • Continue to monitor airway, ventilation, conscious state and BP 	

Seizure activity has ceased

- Clinical approach
- Maintain comfortable position
- Neurological observations, GCS and vital signs every 15 minutes until stable
- BGL
- Provide emotional support to patient and family

If seizure activity continues > 10 minutes

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

Febrile seizure (convulsion)

<ul style="list-style-type: none"> • Undress to singlet, nappy/underpants • Temperature, MSU • Look for focus of infection 	<ul style="list-style-type: none"> • Administer paracetamol (p 150) oral (dose appropriate for age) if there is pain present e.g. otitis media 	<ul style="list-style-type: none"> • Transfer
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Snake bite (adult & paediatric)

Version: 5 Reviewed: December 2018

In all cases

- Reassure the patient
- Keep the patient still
- Cut away clothing to expose limb
- Remove jewellery
- **Do not** wash the site
- Implement and maintain first aid measures including application of pressure immobilisation bandage as per **Pressure Immobilisation Technique RANEG** (p 116)
- Check vital signs and take neurological observations
- Take history as per **Snake Bite Assessment RANEG** (p 81)
- Urinalysis
- Monitor for signs of envenomation

Signs of envenomation (p 81)

Present

- Clinical approach
- Monitor airway, ventilation, conscious state and BP
- Cardiac monitor - sinus tachycardia, ectopy, ST segment and T wave changes are not uncommon
- If pain Severe, consider Methoxyflurane (p 140)/ Morphine (p 143)/ Fentanyl (p 132)
- If patient is inadequately perfused manage as per **Hypovolaemia RANEG** (p 55)
- If anaphylaxis is suspected treat as per **Anaphylaxis RANEG** (adult p 34) (paediatric p 35)
- If nausea present, consult with AV Clinician for antiemetic.

Not present

- Clinical approach
- Reassure patient and significant others
- Implement and maintain first aid measures
- Transport

Do not remove first aid measures once in-situ and transport regardless.

If signs of envenomation are present, arrange for early transport to appropriate facility for antivenom. Consider aero-medical evacuation

For urgent advice contact:
National Poisons Centre
Tel: 13 11 26

The onset of symptoms in children is likely to be more rapid and severe than in adults because of the higher ratio of venom to body mass.

Snake bite assessment

Version: 4 Reviewed: December 2018

Triage assessment

- DRABCD
 - GCS (adult p 5) (paediatric p 12)

Subjective assessment

- Take history of episode:
 - Does patient feel any different? - puncture marks may not be visible
 - When was the patient bitten (elapsed time) - ascertain from patient, relative or significant other details surrounding the event
 - Geographical location of snake (common snakes in that area)
 - Description of the snake if possible (colour, length). Although venom identification kits can be used - attempting to catch the snake should never occur
 - Type and timing of first aid and any activity following bite
 - Type and timing of symptoms – presentation consistent with the actions of the venom
 - Relevant patient past history – any allergy or past exposure to anti-venom, general allergy history, renal, cardiac or respiratory disease and medications

Objective assessment

- Vital signs
- Urinalysis – note haematuria
- Neurological assessment and GCS (adult p 5) (paediatric p 12)

Signs and symptoms of envenomation

General

- Presentation is variable and often signs and symptoms will fluctuate
- May commence with headache, nausea and vomiting, abdominal pain, hypotension, decreased conscious state
- Abdominal pain may be severe due to a combination of factors such as lymph node involvement, direct effect on intestinal muscle/abdominal muscle, haemorrhage and changes in the excretory activity of the kidneys

Local

- Fang marks, oedema at site
- Site may or may not be painful
- Ooze from bite site
- Petechiae
- Bruising or redness
- No signs at all

Systemic

Less than an hour after bite:

- Nausea and vomiting
- Headache and sweating
- Transient hypotension, decreased conscious state
- Regional inflammation and tenderness of lymph nodes

1–3 hours after bite:

- Ptosis and blurred vision on lateral gaze, voice changes.
- Difficulty in swallowing
- Abdominal pain

- Increasing confusion
- Dark urine (due to haemoglobinuria)
- Haemorrhage
- Hypotension/Tachycardia
- Tachypnoea

Over 3 hours after bite:

- Paralysis of larger muscles
- Loss of respiratory muscle function
- Hypoxia
- Circulatory failure, cyanosis
- Shock
- Dark urine
- Rhabdomyolysis

In cases of significant envenomation the patient will be critical in minutes rather than hours.

Remember: Often patients who have had snake bite will not develop systemic envenomation. They will not need antivenom, because the snake has injected little or no venom.

Spider bite (adult & paediatric)

Version: 4 Reviewed: December 2018

- Rest and reassure patient
- **First aid:**
 - Do not wash bite site if funnel web or mouse spider bite is suspected as retained venom will assist identification
 - **Pressure immobilisation technique** (p 116) for suspected funnel web and mouse spider bites only (never for other spider types as may greatly increase pain levels)
 - For all other spider types clean the wound with dilute antiseptic to help prevent secondary infection
 - Apply ice for all spider types (including redback) with exception of white tail, funnel web and mouse spider
 - Elevate wound if appropriate
- Vital signs (serial)
- Take history similar to **snake bite assessment** (p 81)
- Observe for general signs of envenomation

For urgent advice contact:
National Poisons Centre
Tel: **13 11 26**

Signs of envenomation

General

- Painful bite site
- Anxiety
- Nausea, headache
- Muscle weakness
- Tachycardia
- Malaise
- Local sweating at site

Funnel-web spider

- Pain at site, but little local reaction
- Twitching
- Rapid deterioration
- Tingling around the mouth and tongue spasms
- Profuse sweating
- Copious secretion of saliva
- Abdominal pain
- Breathing difficulty
- Confusion leading to unconsciousness
- Hypertension

Red-back spider

- Increasing local pain ++ site becomes hot, red and swollen
- Pain spreading to remote sites++
- Muscle cramps
- Nausea, vomiting and abdominal pain
- Profuse sweating, especially at the bite site
- Swollen tender glands in the groin or armpit of the effected limb
- Patchy paralysis

Present

- Reassure patient
- Cardiac monitor
- Vital signs (serial)
- **IV access**
- Give **paracetamol oral** (p 150) (dose appropriate for age) for pain
- If pain severe consider **methoxyflurane** (140)/ **morphine** (p 143)/ **Fentanyl** (p 132)

Antivenom is the best treatment for the pain of a redback bite: **transfer.**

Trauma – management of multi-trauma patient (adult & paediatric)

page 1 of 2 Version: 5 Reviewed: December 2018

Primary survey

Airway

Rapid assessment for signs of airway obstruction:

Look for presence of airway compromise:

- foreign body
- evidence of airway burns
- facial/neck fractures and/or lacerations

Listen for abnormal sounds:

- snoring
- gurgling
- stridor
- hoarseness
- unable to speak in sentences

Feel for tracheal position and diminished air movement:

- establish patent airway while ensuring cervical-spine protection in all trauma patients
- use manual manoeuvres and introduce airway adjuncts as necessary
- if gag absent and unable to manage airway insert nasopharyngeal airway or LMA (as appropriate)
- suction as required
- stabilise cervical spine with rigid collar support, rolled towels +/- tape

Breathing

Look for:

- paradoxical chest movement
- fractures, lacerations and bruising
- respiratory rate
- use of accessory muscles
- patient colour

Listen for:

- breath sounds
- unequal air entry

Feel for:

- subcutaneous air
- crepitus
- position of trachea
- dullness or hyperresonance

Oxygen

- clinical approach

Life-threatening problems

- tension pneumothorax: chest decompression (p 103)
- consider assisted ventilation
- sucking chest wound: Leave open. Dressing required only if haemorrhage (consider QuickClot dressing)

Circulation

Look for:

- obvious signs of bleeding
- signs of pallor
- GCS (adult p 5) (paediatric p 12)
- abnormalities under the rigid collar

Listen for:

- muffled heart sounds

Feel:

- skin moisture and temperature
- pulses

Control external haemorrhage with direct pressure to the wound

IV access x 2. If required, **Sodium chloride 0.9%** (p 155) as per hypovolaemia RANEG (p 55). If circulation absent commence CPR and follow cardio pulmonary arrest RANEG (p 22)

Disability – rapid neurologic evaluation

A = Alert

V = Responds to vocal stimuli

P = Responds to painful stimuli

U = Unresponsive

- Evaluate pupil size and response

Exposure and environmental control

- Completely undress the patient for examination when able
- Keep patient warm – warm blankets, warm IV fluids, warmed O₂, warm environment

continued next page

Trauma – management of multi-trauma patient (adult & paediatric)

page 2 of 2 Version: 5 Reviewed: December 2018

Secondary survey

Head, skull and face

- Examine and palpate the head, skull and face for deformities, tenderness, crepitus, instability, lacerations and bleeding
- Record pupil size, response and ocular abnormalities.
- Check for contact lenses and remove
- Examine ear canals, mouth and nose for leakage of fluid
- Inspect for bruising around the eyes – (raccoon eyes)
- Check for broken teeth
- GCS (adult p 5) (paediatric p 12)

Neck and cervical spine

- Assume cervical spine injury in trauma, especially with altered conscious state or blunt injury above the clavicle
- Inspect and palpate neck
- Examine for cervical spine tenderness, penetrating wounds, subcutaneous emphysema, tracheal deviation, laryngeal fracture
- Observe the appearance of the neck veins

Thorax

- Examine the entire chest for injury
- Auscultate breath and heart sounds
- Palpate the clavicles and ribs
- Apply sternal compression to detect sternal fractures or flail segments
- Consider abdominal injury if lower thorax injured

Abdominal

- Inspect for signs of injury eg. bruising, pain tenderness, distension, rigidity and guarding
- Listen for bowel sounds
- Palpate
- Consider renal injury:
 - flank pain
 - bruising
 - haematuria
- Consider chest injury if abdomen injured

Perineum/rectum/vagina

- Examine for contusions, haematomas, lacerations and bleeding
- Blood at the urethral meatus may indicate urethral injury – **do not** insert a urethral catheter
- Pain on pelvic palpation or pelvic mobility can suggest pelvic fracture. If present apply pelvic splint
- Observe for bruising over the iliac wings, pubis, labia or scrotum

Musculoskeletal

Back:

- Perform log roll and examine back
- Check anal sphincter tone
- Inspect and palpate for deformities, haematomas, soft tissue injuries and assess circulation
- Consider thoracic and lumbar spine fractures

Musculoskeletal (continued)

Extremities:

- Motor and sensory evaluation of the extremities
- Signs of spinal injury:
 - hypotension and relative bradycardia
 - decreased motor function and sensation
 - priapism

Other considerations

- Danger to self
- Obtain a complete set of vital signs
- Diagnostic monitoring such as ECG
- Ensure clear, accurate and concise documentation
- Pre hospital information: (MIST)
 - M** = Mechanism of injury
 - I** = Injuries sustained
 - S** = Signs and symptoms
 - T** = Treatment
- Patient generated history: (AMPLE)
 - A** = Allergies
 - M** = Medications currently used
 - P** = Past illnesses/pregnancy
 - L** = Last meal
 - E** = Events/environment related to the injury
- Analgesia
- Hypothermia is associated with mortality in trauma. All available warming methods should be employed

Multi-trauma assessment

page 1 of 2 Version: 2 Reviewed: November 2016

Triage assessment

- DRABCD
- Asphyxia is the most common cause of death after an accident
- Assess:
 - level of consciousness: patient's memory of incident – GCS (adult p 5) (paediatric p 12)
 - obvious injuries
- **Note:**
 - first responder/witness observations or interventions
 - patient position
 - shape of the limbs
 - damage to clothing, bleeding
- **Ask the conscious patient:**
 - where does it hurt
 - can you breathe/cough without it hurting
 - can you move your limbs
 - pertinent medical history
 - allergies, medication, tetanus status
 - last meal eaten
- **Pulse guidelines:**
 - if palpable at wrist, SBP > 80 mmHg.
 - palpable in groin, SBP 60–80 mmHg.
 - not palpable in groin but palpable in the neck, SBP < 60 mmHg

Subjective assessment

Take report of incident from patient, witnesses or any first responders, including:

- **Mechanism of injury (MOI)**

Blunt:

- Road traffic accident:
 - patient's position in vehicle
 - restraint devices, vehicle characteristics e.g. model, area of impact e.g. front, side, rear
 - speed and MOI
 - damage to vehicle, especially windscreen, steering wheel, other occupants.
- Motorcycle accident:
 - speed and MOI
 - distance victim thrown
 - use of helmet
- Pedestrian:
 - speed and MOI
 - distance victim thrown
 - vehicle characteristics e.g. model
- Fall:
 - mechanism: down stairs, from a building, from a moving vehicle
 - distance
 - type of surface patient landed on such as cement, grass, water

- Assault:
 - type of object used
 - number and location of blows
 - were assailants known to patient
- Crush injury:
 - MOI, such as roller, direct weight
 - duration of entrapment
- Watercraft/boating
 - MOI
 - type of craft involved.
- Sport and recreation-related
 - MOI

Penetrating:

Type of object used:

- Stab wound (notify police if indicated):
 - direction
 - estimated depth of penetration
 - size of instrument
- Gunshot wound (notify police):
 - weapon type
 - calibre and firing distance
 - number of shots fired
 - location of entrance and exit wounds
 - presence of powder burns on skin or clothing

Multi-trauma assessment

page 2 of 2 | Version: 2 | Reviewed: November 2016

Objective assessment

The multiple trauma patient needs a coordinated team approach, enabling assessment and intervention to be carried out simultaneously. When the phases of care are performed in the manner discussed, best outcome potential for the patient is maximised.

Important points:

- Determine all injuries.
- Exact priority rules cannot be developed. Priorities of care will be determined by each individual patient's condition, the exact nature and mix of injuries and the availability and ability of attending staff.
- The priority of care is given to those injuries that have the greatest potential to impact on airway, breathing and circulation.
- The traditional breakdown of history, examination, investigation and treatment are not often followed in trauma management. It may be that examination and treatment are well underway before investigations are back or the history is made clear.

Primary survey

DRABCDE:

- Dangers
- Response
- Airway, with cervical spine control
- Breathing and ventilation
- Circulation and haemorrhage control
- Disability (neurological deficit)
- Exposure

Immediate life-threatening conditions are identified and addressed during the primary survey.

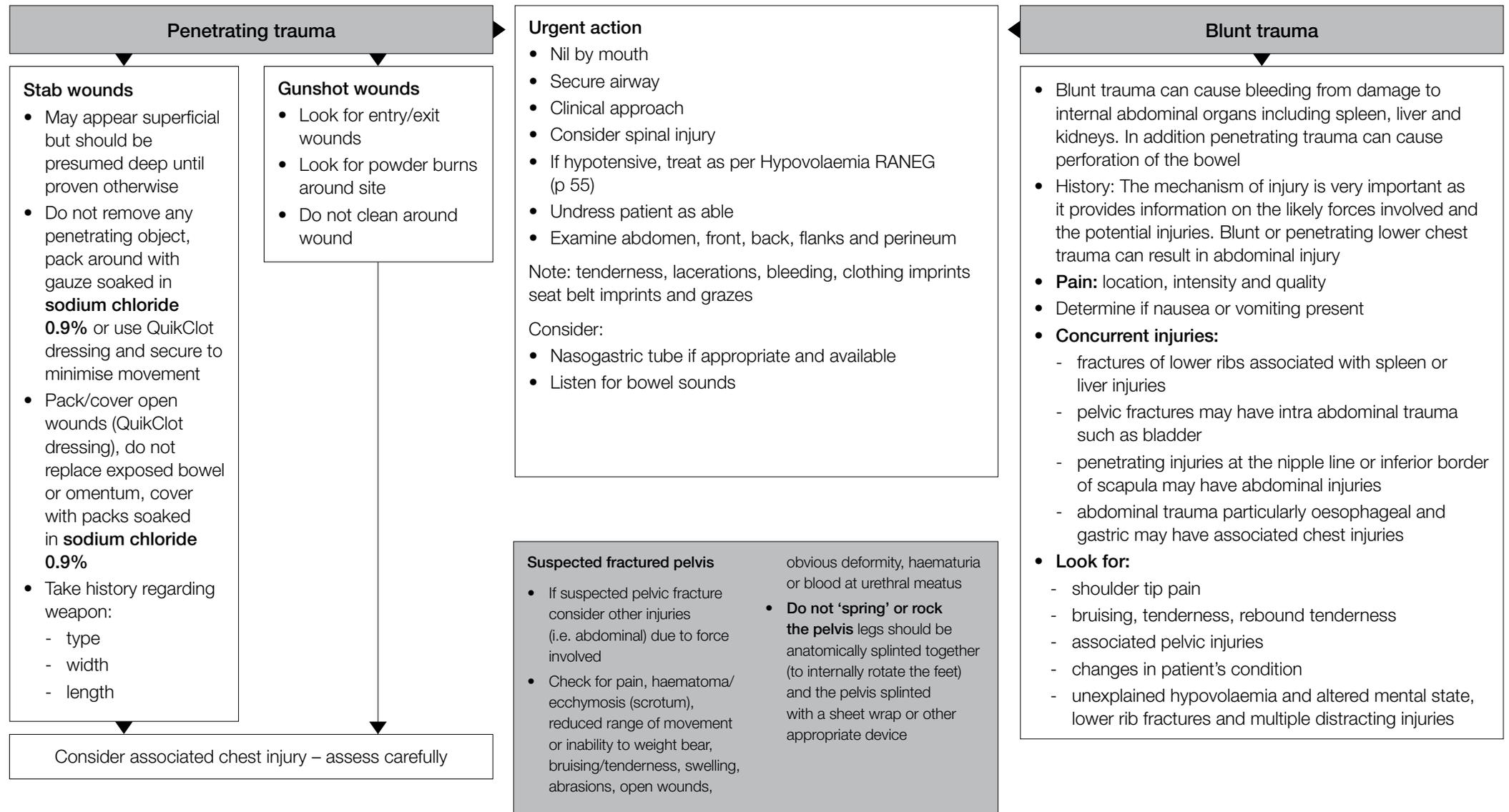
Secondary survey

History and head to toe examination. Detailed examination is performed. All injuries should be identified and decisions about treatment made.

- Head to toe assessment once **airway, breathing, circulation** stable:
 - evaluate history of unconsciousness, palpate scalp for evidence of lacerations, depression fracture
 - check for loose teeth as these may be aspirated; if patient conscious replace teeth and splint with foil
 - examine the neck for pain, tenderness, deformity, displacement of trachea and distended neck veins
 - check for splinting, asymmetry, paradoxical respiration, which may lead to airway obstruction
 - blunt injuries to thoracic wall (steering wheel) may result in aortic rupture, fractured sternum, palpate ribs, noting crepitus and identify the site of injury
 - observe for flail chest
 - the spleen, liver, stomach, intestines and pancreas are vulnerable to blunt trauma – palpate the abdomen frequently
 - examine all pulses carefully, compare bilaterally
 - suspect a fracture with localised pain, swelling, deformity, bruising
 - predisposing causes: stroke, AMI, syncope
 - note decreased sensation and inability to move extremities
 - palpate the spine

Abdominal trauma (adult & paediatric)

Version: 4 Reviewed: November 2018



Chest injury (adult & paediatric)

Version: 5 Reviewed: December 2018

Mechanism

- Blunt injury - direct blow to chest such as impact of steering wheel
- Iatrogenic - aggressive ventilation
- Spontaneous pneumothorax

Presentation

- Severe inspiratory chest pain, anxiety, cyanosis
- Dyspnoea

Ventilation inadequate

- Clear airway
- Clinical approach
- Analgesia
- Assess chest wall/back
- If inadequately perfused (exclude tension pneumothorax) and treat as per Hypovolaemia RANEG (p 55)

Ventilation adequate

- Clinical approach
- Analgesia
- If inadequately perfused (exclude tension pneumothorax) and treat as per Hypovolaemia RANEG (p 55).

Consider cervical spine immobilisation

- Consider:**
- Pneumothorax
 - Flail chest
 - Cardiac tamponade
 - Pulmonary contusion
 - Aortic disruption
 - Tracheobronchial disruption
 - Oesophageal disruption
 - Tension pneumothorax

Tension pneumothorax

Signs

- Decreased or nil breath sounds on affected side
- Increasing distension of neck veins
- Tracheal shift to opposite side
- Subcutaneous emphysema
- Inadequate perfusion

Management

If some signs of the above are present, **SBP < 70 mmHG** and **GCS < 10**, attempt **immediate chest decompression**.

- If bilateral tension pneumothorax decompress right side first
- Insert Air Release System (ARS) needle into the 2nd intercostal space, just medial to the mid-clavicular line, above the 3rd rib, at right angles to the chest wall, aimed slightly towards the vertebral body
- If no air escapes but copious blood flows through the cannula then a major haemothorax is present; remove the cannula, cover the insertion site with a clear adhesive dressing
- If air escapes, or air and blood bubble through the cannula, leave insitu and secure
- If ARS unavailable, use a long (> 45 mm) 14 gauge cannula instead (adults)
- Paediatrics (<12 years): use a 14 or 16 gauge cannula depending on patient size.

Mechanism

- Penetrating injury - stab or missile wound to chest

Presentation

- Chest pain +/- restlessness, anxiety, cyanosis
- Dyspnoea
- Look for entry/exit wound

Ventilation inadequate

- Clinical approach
- Open chest wound: Leave open. Dressing required only if haemorrhage (consider QuickClot dressing)
- Leave penetrating objects insitu and splint to minimise movement
- Assess chest wall/back
- If inadequately perfused (exclude tension pneumothorax) and treat as per Hypovolaemia RANEG (p 55).
- **Transfer immediately**

Ventilation adequate

- Clinical approach
- If inadequately perfused (exclude tension pneumothorax) and treat as per Hypovolaemia RANEG (p 55).
- **Transfer immediately**

Insertion site for cannula/intercostal catheter (**SMART**):

- Second intercostal space
- **Mid** - clavicular line (avoiding medial placement)
- **Above** rib below (avoiding neurovascular bundle)
- **Right** angles to chest
- **Towards** body of vertebrae

Limb injuries (adult & paediatric)

Version: 5 Reviewed: December 2018

In all cases assess for shock -

- Apply direct pressure to control external bleeding. Use QuickClot Haemostatic dressing to assist in haemorrhage control.
- Immobilise and splint as required.
- Combat Application Tourniquet (CAT) may be considered in the event of a limb injury with uncontrolled, life-threatening haemorrhage. If tourniquet is applied, document time applied on the tourniquet and in PCR. DO NOT remove the tourniquet once applied.
- Protect and immobilise spine if indicated (p 92).
- Pain relief: **Methoxyflurane** (140)/ **Morphine** (p 143)/ **Fentanyl** (p 132)
- Treat as per hypovolaemia RANEG (p 55)
- Complete secondary survey (p 2)
- Examine injured limb – even if splint already in place – ensure correctly applied – check pulse distal to the splint (cut off/remove clothes)
- Perform neurovascular assessment distal to fracture site
- Apply simple sterile dressings to wounds (saline soaked dressing where appropriate)
- Splint fractures (immobilise the joint above and below fracture site) and elevate as soon as practicable
- Care of the amputated limb or digit (p 94)
- **IV access**

Splinting

- Realignment of limb fractures will be necessary where there is significant compromise to distal circulation (no pulse, cyanosis etc.)
- Re-align long bones as near as possible to normal
- If joint involvement re-alignment not recommended
- Open fractures, irrigate with **sodium chloride 0.9%** prior to splinting and dress with saline soaked dressing
- Consider anatomical splinting where appropriate

Lower extremities

Fractured femur

- Check deformity, local swelling, point/localised tenderness, variable degrees of extremity shortening and external rotation, inability to weight bear, pain
- Immobilise limb using appropriate splinting

Fractured patella

Severe pain, point/localised tenderness, inability to weight bear, swelling, inability to straighten leg:

- avoid manipulation
- apply ice packs
- rest patient in position of comfort

Fractured tibia/fibula

Severe pain, inability to dorsiflex foot, capillary return to toes may be diminished:

- immobilise – using appropriate splint

Fractured ankle

Immediate pain, swelling, immobility, inability to weight bear, point tenderness, deformity:

- immobilise – apply splint as able and ice pack

Upper extremities

Dislocated shoulder

- Characterised by severe pain, inability to move, and deformity
- Patient will hold arm in position of comfort, support this action

Fractured clavicle

- Characterised by pain and inability to move arm; patient often holding injured hand with unaffected arm
- Apply sling

Fractured humerus

- Painful and unable to move arm
- Nerve damage is evidenced by numbness of thumb and inability to raise hand at wrist
- Apply sling

Fractured radius/ulna

Point/localised tenderness, swelling, deformity, pain:

- Immobilise above and below joint and apply sling and ice packs where able

Fractured wrist

Point/localised tenderness, pain, swelling, deformity (not always):

- immobilise above and below joint and apply sling and ice pack

Limb injuries assessment

page 1 of 2 Version: 4 Reviewed: November 2016

Soft tissue injury

- May incorporate many structures including blood vessels, nerves, muscle, skin, ligaments and tendons
- If suspected apply RICER principles – Rest, Ice, Compression, Elevation and Referral

Dislocations and subluxations

- Joint surfaces that are no longer in contact, or partially displaced
- Occurs when the joint is forced beyond anatomical range of motion
- Symptoms include loss of normal mobility, pain, change in contour of the joint and discrepancy with length of the extremity. Spontaneously reduced dislocations need further medical assessment including radiology

Fractures

- Results from stress or force placed on the bone that it cannot absorb
- May be caused by direct or indirect trauma including pathological fractures in patients with bone disease
- Classified as stable/unstable and open/closed
- Blood loss (estimated in adult):
 - humerus – 500 to 2500 mL
 - elbow – 250 to 1500 mL
 - radius/ulna – 250 to 1000 mL
 - pelvis – 750 to 6000 mL
 - hip – 1500 to 3000 mL
 - femur – 500 to 3000 mL
 - knee – 1000 to 2500 mL
 - tibia/fibula – 250 to 2000 mL
 - ankle – 250 to 1500 mL
 - spine/ribs – 1000 to 3000 mL

Triage assessment

- Assess:
 - chief complaint
 - DRABCD (think haemodynamic compromise and disability – pain level)
 - general appearance (including swelling and deformity)
 - environment
 - history
 - comorbidities
 - apply Australasian Triage Scale (ATS) category

Subjective assessment

- Determine history of injury
- Mechanism of injury
 - blunt
 - penetrating
 - crush
- Pain levels – factors that increase or decrease pain
- Ability to weight bear
- Past medical history:
 - pulmonary problems, bleeding disorders, diabetes
 - previous fractures
- If paediatric patient, and patient or family cannot give adequate explanation of mechanism of injury, consider possibility of child abuse
- Be alert to possibility of hip/pelvic/cervical fractures in elderly patients who may have had minor falls

Objective assessment

- Assess vital signs (including GCS)
- 5 P's – pain, pallor, paralysis, paraesthesia and polar (coolness)
- Neurovascular assessment
 - pulses – presence and quality
 - upper limbs – radial, ulnar and brachial
 - lower limbs – femoral, popliteal, posterior tibial and dorsalis pedis
 - temperature – feel if skin is cool or warm
 - capillary refill – filling time more than 2 seconds is abnormal
 - sensation
 - colour of whole limb – compare with unaffected side
- Pain – usually caused by injury to the periosteum
- Oedema/swelling
- Ecchymosis due to blood in the tissues
- Muscle spasm – caused by continuous contraction of the muscle over the injured part
- Crepitus – caused by the fractured bone ends moving against each other; can be heard or felt
- Movement – do not test full range of movement on an injured limb as this could cause further injury to ligaments, muscle and/or vessels
- Deformity
- Skin integrity:
 - wounds – particularly if over the fracture site
 - if the skin is stretched or pale over the fracture site

Limb injuries assessment

page 2 of 2 Version: 4 Reviewed: November 2016

Paediatric considerations

- A child's skeleton is more flexible than adults and is actively growing
- The elastic nature of a child's bones allows a greater level of energy absorption prior to fracture – don't underestimate the degree of soft tissue injury or underlying organ injury

General guidelines for fracture management

- Primary survey and initiate appropriate interventions
- Evaluate neurovascular status (before and after moving the limb)
- Impaled/penetrating objects – secure, **do not** remove
- Manage pain
- Remove rings, other jewellery and tight clothing/shoes from injured extremities
- Re-evaluate neurovascular status after repositioning or immobilisation
- Cover open wounds with sterile dressing and/or saline-soaked dressing
- Apply ice packs to areas of swelling
- Elevate injured extremity

Trauma – Spinal injury (adult & paediatric)

Version: 6 Reviewed: December 2018

Does patient meet trauma time-critical guidelines? (p 4 & 9)

Yes
Full spinal Immobilisation

Spinal Immobilisation

- Reassure patient and give instructions not to move head/body
- Do not move patient unnecessarily
- Apply rigid cervical collar
- Place patient supine if possible
- Maintain head in midline position using rolled towels or approved proprietary device, and tape
- Secure patient to spine board with straps or tape over chest, hips and knees (the head should not be independently restrained)
- Lateral position if vomiting or roll spineboard if already secured

Remember: If MOI only, a paediatric patient automatically meets trauma time-critical guidelines (p 3). Apply all spinal care.

- Clinical approach
- Manage airway as appropriate
- Pain relief as required - **Methoxyflurane** (140)/**Morphine** (p 143)/ **Fentanyl** (p 132)
- Immobilise and support fractures.
- Manage hypovolaemia – consider **sodium chloride 0.9% IV** to improve perfusion in patients with isolated neurogenic shock
 - **adult:** if SBP <90mmHg, **Sodium chloride 0.9% 10mL/kg IV** (p 155) bolus
 - **paediatric:** if hypotensive for age, **Sodium chloride 0.9% 5mL/kg IV** (p 155) bolus

If hypotension is consistent with hypovolaemia from other injuries and patient becomes unstable, follow hypovolaemia RANEG (p 55).

- Keep patient warm using space blanket
- Protect pressure areas
- Consult with appropriate service for ongoing management or transfer requirements

No
But has positive mechanism of injury (adult)

- Conduct full examination (including neurological examination) and obtain relevant history
- If any of the following are present then provide spinal immobilisation:
 - age > 55 years
 - history of bone disease (e.g. osteoporosis, osteoarthritis or rheumatoid arthritis)
 - unconscious or altered conscious state (GCS < 15) or period of LOC
 - drug or alcohol affected
 - significant distracting injury (i.e. extremity fracture or dislocation)
 - spinal column pain/bony tenderness
 - neurological deficit
- If none of the above are present spinal immobilisation/ cervical collar may not be necessary

If any doubt exists as to history or the above assessment, or if there is inability to adequately assess the patient, then spinal immobilisation must be provided.

Trauma – Spinal injury assessment

Version: 5 Reviewed: December 2018

Triage assessment

- Assess:
 - respiratory status, observe for diaphragmatic breathing
 - immobilisation of spine, use a well fitted rigid collar and spine immobilisation board or available spinal immobilisation equipment
 - movement of extremities

Subjective assessment

- Take history:
 - MOI reported by patient or witnesses (suspect cervical spine injury with any trauma above clavicle, head injury, diving accident, coma, high speed accident)
 - extent of movement and sensation after injury
 - method of immobilisation at scene – by witnesses/ ambulance personnel or other first responders
 - past injuries to spinal column and residual deficits
- Check associated symptoms:
 - complaints of pain along spinal column, with/ without palpation
 - numbness or tingling of extremities (note: presence or absence of cervical pain is a reliable indicator only in the alert patient; always consider spinal injury in the traumatised, unconscious, or intoxicated patient or when the mechanism of injury is consistent with potential spinal damage)

Objective assessment

- Vital signs:
 - hypotension and bradycardia may be present
 - observe respirations as paralysis of the intercostal muscles and/or the diaphragm may occur
- Assess mental status
- Check ability to move extremities; deficits occur at and distal to the level of injury
- Spinal cord injury may be manifested by:
 - absence of anal sphincter tone
 - urinary retention
 - loss of sweating reflex
 - loss of vasomotor tone
 - hypotension
 - loss of thermoregulation (temperature control)
- Check for obvious spinal deformity
- Priapism is indicative of spinal cord injury

Assess for associated injuries

Force great enough to result in spinal injury may also cause significant other injuries. Ensure full secondary survey is undertaken.

SPINAL CORD INJURY CARD

THE LEVEL AT WHICH SENSATION IS ALTERED OR ABSENT IS THE LEVEL OF INJURY

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

SENSORY EXAMINATION

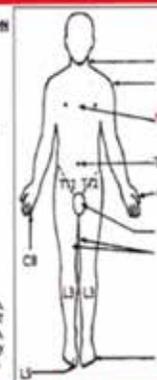
EXAMINE BY:
Light touch
Response to pain

USE:
The hand on your palm to what is normal sensation

EXAMINE:
Upper Limbs and hands
Lower Limbs and feet

EXAMINE:
Both Sides

T4 EXAMINATION:
Must be carried out in the MID-AXILLARY line, NOT the MID-CLAVICULAR line, as C2, C3 and C4 all supply sensation to the nipple line.



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

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MOTOR EXAMINATION

THE LEVEL AT WHICH WEAKNESS OR ABSENCE OF MOVEMENT IS NOTED, IS LEVEL OF INJURY

MOTOR EXAMINATION: EXAMINE BOTH SIDES

UPPER LIMB MOTOR EXAMINATION	LOWER LIMB MOTOR EXAMINATION
ASK PATIENT TO:	ASK PATIENT TO:
1. Shrug Shoulders =C4	5. Flex Hip =L1 & L2
2. Bend Elbow =C5	6. Extend Knee =L3
3. Push Wrist Back =C6	7. Pull Foot Up =L4
4. Open/Close Hands =C8	8. Push Foot Down =L5 & S1

THORACIC AND ABDOMINAL MOTOR EXAMINATION
Look for Activity of Intercostal and Abdominal Muscles

DIAGNOSIS OF SPINAL CORD INJURY IN THE UNCONSCIOUS PATIENT

1. Look for paradoxical respiration (i.e. Quad has lost intercostal muscles so he/she relies on the diaphragm to breathe)	4. Loss of reflexes below level of lesion
2. Flaccid Limbs	5. Erection in the Unconscious Male
3. Loss of response to painful stimuli below the level of the lesion	6. Low B.P. (Systolic less than 100) associated with a normal pulse or bradycardia should be treated as a QUADRAPLEGIC until proven otherwise

IF YOU DON'T THINK ABOUT A SPINAL CORD INJURY YOU WILL MISS IT!!

TREATMENT:

1. A. B. C.
2. Immobilise Injured Part
3. Lift Patient in one piece, in Position Found
4. Don't Move Patient too many times

Trauma – Traumatic amputation (adult & paediatric)

Version: 4 Reviewed: December 2018

In all cases

Assessment and management

- **Control haemorrhage** with pressure dressings. If haemorrhage unable to be controlled, consider application of Combat Application Tourniquet (CAT).
- If severe limb wounds not controlled by CAT, apply QuickClot Haemostatic dressing
- Support the limb in a functional position if partly severed – splint as appropriate
- Remove dirt/debris if practical. If tourniquet is applied, document time applied on the tourniquet and in PCR. DO NOT remove the tourniquet once applied.
- Dress stump site with **sodium chloride 0.9%** packs; cover with a dry bandage
- Elevate limb or body part
- Keep patient nil by mouth
- **IV access**

If less than adequate perfusion treat as per Hypovolaemia RANEG (p 55)
Analgesia **Methoxyflurane** (140)/ **Morphine** (p 143)/ **Fentanyl** (p 132)

Care of the amputated part

Always treat as though amputated part is going to be used for reimplantation

- Keep part cool
- **Do not freeze**
- Place part in double plastic bag as follows:
 - wrap the part in gauze soaked in **sodium chloride 0.9%** and place in inner bag
 - place inner bag with part into outer plastic bag filled with ice slush, if available

Success of reimplantation depends on a number of factors:

- availability of team
- amount of damage to part
- time elapsed since the accident
- general condition of the patient

Trauma – Traumatic head injury (adult & paediatric)

Version: 6 Reviewed: December 2018

Airway/breathing:

- Clinical approach
- Clear airway (do not move neck unnecessarily)
- Apply cervical collar (p 101)
- If airway is patent and breathing/ventilation is adequate (even with trismus), **do not** insert NPA/OPA
- If airway is **not** patent and gag is present (+/- trismus), insert NPA and assist ventilations
- If gag is absent insert OPA or LMA and assist ventilations (any gag can harmfully raise intracranial pressure and must be avoided)
- Ensure adequate ventilation and tidal volume of 10 mL/kg

Circulation:

- **Sodium chloride 0.9% IV (max 40mL/kg)** (p 155) titrated to patient response (unless in the setting of penetrating truncal trauma or uncontrolled overt bleeding)
- If SBP <100mmHg after 40mL/kg, consult with ARV. If consult is unavailable, **Sodium chloride 0.9% 20mL/kg IV** (p 155)
- **Avoid hypotension** – aim to maintain SBP of:
adult: 120 mmHg
paediatric: appropriate for age as per inadequate perfusion RANEG (p 13)
- Consult ARV if penetrating truncal trauma or uncontrolled haemorrhage

Ongoing management:

- Sitrep ASAP
- GCS & vital signs at least every 15 minutes.
- Treat sustained seizure activity with **midazolam** (p 142) as per **seizures** (adult p 78 or paediatric p 79).
- Examine scalp for lacerations, fractures or boggy areas.
- Exclude causes of altered conscious state such as hypoglycaemia, hypotension, tension pneumothorax, hypoxia, hypothermia, hyperthermia, etc.

Agitated Traumatic Head Injury:

- **RAN safety is paramount and must be taken into consideration prior to any patient management**
- In patients with mild to moderate acute traumatic head injury (GCS 10-14), **sedation can only be given after consultation with the duty AV Clinician / Adult Retrieval Victoria**

Consider:

- Fractured base of skull (BOS) – signs may include raccoon eyes (peri-orbital bruising); spinal fluid leaking from ear or nose or bruising behind the ears (*nasopharyngeal airways are a precaution with #BOS*).
- 5HEDS assessment criteria (p 96)
- Depressed skull fracture
- Extradural haematoma
- Subdural haematoma
- Concussion

Bradycardia, hypertension and irregular respirations are late signs of raised intracranial pressure ('cushing triad').

Note: Any change in conscious state (such as patient becomes irritable) may be the first sign of a significant head injury or hypoxia – ensure good oxygenation and ventilation, perform GCS and vital signs frequently and report findings.

Trauma – Traumatic head injury assessment

Version: 4 Reviewed: November 2016

Clinical presentation of specific head trauma

• Fractured base of skull

May present with:

- Battle's sign – bruising behind ears (late sign)
- raccoon eyes – orbital bruising
- rhinorrhoea – spinal fluid from nose
- otorrhoea – spinal fluid from ear
- haemotympanum – blood behind the eardrum

(All of the above are signs of possible skull fracture)

• Depressed skull fracture

May present with:

- signs and symptoms determined by amount of brain damage
- injury may result in cerebral oedema, look for decreased level of consciousness, dilated pupil on side of haematoma, weakness on opposite side

• Extradural haematoma

May present with:

- LOC followed by improved GCS and subsequent deterioration; severe vomiting, headache; rapid deterioration with decreased GCS, dilated pupil on side of haematoma, weakness on opposite side

• Subdural haematoma

May present with:

- altered level of consciousness, headache, personality changes, dilated pupil on side of haematoma, weakness on opposite side

• Concussion (retrospective diagnosis)

May present with:

- transient LOC, memory loss, nausea, vomiting, dizziness, headache

Late signs of raised intracranial pressure

May present with:

- hypertension/increased pulse pressure
- bradycardia
- irregular respiration

NOTE: Any change in conscious state, for example, patient becomes irritable, may be the first sign of a significant head injury or hypoxia – GCS and neurological observations frequently.

5HEDS Blunt Head Injury Assessment Criteria

When assessing the pattern of injury, the patient can be considered to have a serious blunt head injury in the setting of blunt head trauma with or without loss of consciousness/ amnesia and GCS 13 - 15 with any of:

- **5** minutes or greater of LOC
- **H** visible or suspected head fracture
- **E** more than one episode of emesis
- **D** neurological dysfunction noted
- **S** seizure activity observed at any time

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Airway adjuncts

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In the patient with an unprotected airway, the airway needs to be manually cleared before breathing can be assessed, stabilised or supported. Often positioning the patient in the left lateral position, or performing a head tilt, chin lift or jaw thrust (triple airway manoeuvre), will be enough to create a patent airway.

If you are satisfied with these measures, and your patient can be ventilated and the airway remains patent, no airway adjuncts are required.

However, if there is some difficulty in maintaining the airway, either through physical problems, or not enough 'hands' to help, then an airway adjunct may be helpful or life-saving.

Oropharyngeal (Guedel) airway

1. Maintains forward displacement of tongue in unconscious patients

Contraindications:

1. Trismus
2. Gag reflex present (can induce vomiting with unprotected airway – see caution)
3. Traumatic brain injury and neurological event where airway is patent and ventilation is adequate despite trismus (may induce gag and rise in ICP).

Sizing and insertion:

1. Choose airway: measure from the corner of the patient's mouth to the earlobe. (see Figure 8)
2. Lubricate with patient's saliva or water
3. With airway clear, triple airway manoeuvre maintained, hold oropharyngeal (Guedel) airway by flange with natural curve upside down

4. Pass the tip first and insert half way, rotate 180° while continuing to insert until flange rests on the patient's lips. If patient gags remove immediately (see Figure 9)

Note: Paediatric: use a tongue depressor or laryngoscope to push the tongue down and insert directly in line with the anatomical curve of the airway. Do not rotate OP airway on insertion.

5. Maintain triple airway manoeuvre and assess breathing
6. Ensure lower lip is not pinched between teeth and OP airway

Caution: Avoid airway adjuncts in primary brain injuries unless unable to maintain airway and adequate ventilation with basic techniques and BVM. A nasopharyngeal airway (unless contraindicated) would be used in preference to an oropharyngeal (guedel) airway. Invoking a gag reflex in these patients can cause a prolonged rise in intracranial pressure resulting in secondary brain injury

Figure 8



Figure 9



Nasopharyngeal airway

Indications:

1. Unconscious with trismus.

Contraindications:

1. Middle third facial fractures
2. Significant nasal trauma

3. Traumatic brain injury and neurological event where airway is patent and ventilation is adequate despite trismus (may induce gag and rise in ICP)

Precautions:

1. Base of skull fractures (may intrude into brain tissue)
2. CSF from nares or ears

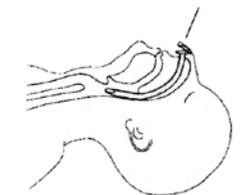
Sizing and insertion:

1. Measure from the tip of the patient's nostril to the tip of the earlobe and should be about the diameter of the patient's nostril (see Figure 10)
2. Lubricate the NP airway with lubricating gel
3. Inspect nostrils for obstruction and select widest
4. With airways clear, triple airway manoeuvre maintained, push tip of NP airway gently upward towards eyes, insert gently along floor of nose (90° to patient's face)
5. If resistance is experienced rotate clockwise and anticlockwise while inserting (**do not** force)
6. If further resistance is felt, re-lubricate and try other nostril or smaller NP airway
7. Insert to measured length (too far may invoke gag or move into oesophagus) (see figure 11)
8. Maintain triple airway manoeuvre, nasopharyngeal airway position, assess breathing and suction PRN; replace if obstruction remains

Figure 10



Figure 11



Airway adjuncts

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Laryngeal mask airway (LMA)

Indications:

1. Unconscious patient without gag reflex
2. Ineffective ventilation with BVM and airway management (oropharyngeal (Guedel) airway/ nasopharyngeal airway)
3. Greater than 10 minutes assisted ventilation required

Contraindications:

1. Intact gag or resistance to insertion
2. Strong jaw tone +/- trismus
3. Suspected epiglottitis or upper airway obstruction

Precautions:

1. Inability to prepare the patient in the 'sniffing position'
2. Patients 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)
3. Patients < 14 years of age due to enlarged tonsils
4. Significant volume of vomit in airway

Side effects

Correct placement of the LMA does not prevent passive regurgitation or gastric distension and should not be considered the equivalent to an endotracheal tube

I - Gel Supraglottic Airway

1. Select I - Gel LMA size by estimation of patient weight
2. Lubricate anterior and posterior surfaces of the airway tip using lubricating gel

Size	Patient weight (kg)	Colour	Doudenal tube size
5 (larger adult)	90+	orange	14
4 (normal adult)	50-90	green	12
3 (small adult)	30-60	yellow	12
2.5	25-35	clear	12
2	10-25	grey	12
1.5	5-12	blue	10
1	2-5	pink	N/A

Prepare patient:

1. Utilise PPE including P2 mask (standard precautions)
2. Position self behind patient's head
3. Ensure airway is not obstructed and head in neutral alignment
4. If necessary place an appropriate support under head
5. Extend head and flex neck into 'sniffing position' by spreading fingers of right hand over patient's occiput and right thumb centrally above eyebrows parallel with patient's nose
6. Ensure external auditory meatus is in the same horizontal plane and level with the supra sternal notch
7. Pre-oxygenate patient with 100% O₂ via BVM
8. Assistant to pull down lower jaw to ensure opening of at least three fingers or insertion will fail

Insert LMA:

1. Grasp the LMA between the fingers and thumb of left hand, with the distal aperture facing towards the tongue and black print facing away from the tongue; in patients with enlarged tonsils the LMA may unintentionally rotate 180° during insertion
2. Maintain appropriate pressure to lower jaw to allow passage of LMA; jaw thrust to be used as required
3. Advance the mask over the top of the tongue, pushing the back of the mask against the hard palate
4. Maintain downward pressure until forward movement stops
5. If resistance is encountered early, a gentle clockwise and anti-clockwise rotation of the tube around its long axis when entering the pharynx may assist to correctly seat the I-Gel (approx +/- 20°)

Figure 12



Airway adjuncts

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Post-insertion checks

1. The correctly positioned I-Gel should have the teeth approximately in line with the horizontal black line. It may still be correct if the teeth are lower down (adult sizes only).
2. Attach BVM and gently ventilate ensuring minimal air leakage whilst observing rise and fall of the chest.
3. Auscultate anterior chest for equal and adequate air movement and abdomen to ensure nil abdominal air sounds and correct placement.

If inadequate seal detected:

1. Rotate LMA clockwise/anticlockwise $\pm 75^\circ$ with downward pressure (icecream scooping) to seat LMA correctly.
2. If above fails, use jaw thrust and reinsert. This will likely require assistance to perform to make a space posterior to the tongue in the pharynx.

Securing the LMA:

1. Secure I-Gel with 2.5cm transpore tape by applying tape across right cheek over and around I-Gel tube at level of lips forming a chevron then securing to the left cheek.
2. Secure another length of tape across tube to form a chevron then across both sides of mandible.
3. Ensure that the I-Gel tube is sitting centrally. An offset position could unseat the cuff and cause leak.
Alternatively the I-Gel can be secured using cotton tracheal tube tape.

General care:

1. If insertion fails check position of LMA cuff using a laryngoscope. If minor adjustment fails to correct the problem, remove the LMA. Immediately insert an oropharyngeal (Guedel) airway/nasopharyngeal airway and ventilate using a BVM. Only two attempts may be made to reinsert LMA.
2. Patients may be managed in the lateral position when the LMA has been correctly inserted and taped in situ. It is generally recommended that patients be Mx supine and carefully observed to avoid aspiration.
3. If the conscious state of the patient improves and there is an attempt to reject the LMA, remove the LMA with the cuff inflated.

Alcohol intoxication

Version: 3 Reviewed: December 2017

Any person who presents as incoherent, disorientated or drowsy should be treated as having a cerebral event until proven otherwise.

Triage assessment

- DRABCD
- Assess:
 - GCS (adult p 5) (paediatric p 12)
 - gait: normal or ataxic

Subjective assessment

- History of present event:
 - reason for presenting; may be unrelated to alcohol, such as chest pain – these patients require assessment
 - history should be obtained from a reliable witness, for example, family member, or first responder
 - duration, type and amount of alcohol consumed, if known
 - assess possibility of other drug or medication intake
- Past medical history:
 - current medications and allergies
 - any previous help from alcohol support groups
 - possibility of seizures, trauma, poisoning
 - acute or chronic alcohol intake

Objective assessment

- Vital signs
- Lying and standing BP if:
 - patient gives history of fluid loss such as vomiting/diarrhoea
 - patient is tachycardic
- Respiratory status – may be diminished with high levels of alcohol
- GCS (adult p 5) (paediatric p 12) until head injury disproven
- Complete neurological assessment, including FAST
- Check for obvious trauma such as lacerations or abrasions
- Appearance
- Incontinence
- Vomitus on clothes or body
- Nutritional status

Document: 'patient ataxic with slurred speech' or 'odour of alcohol on breath' or 'patient admits to alcohol ingestion', rather than claiming patient is intoxicated.

Priorities of care

- Protection of airway
- Assessment of complaints or injuries
- Protection from further injury
- Re-evaluation when patient is sober
- Obtain BGL

Evaluate other complaints or concerns of altered mental status

Management

- Ensure personal safety. Be aware of the potential for patient agitation/aggression/violence. Consider seeking help from police or others
- A calm approach helps make the patient feel safe. Confrontation stimulates the person who is hypersensitive because of alcohol
- Treat as a priority since the longer an intoxicated person has to wait, the greater is their potential for disruption and further deterioration
- Patients may attempt to refuse care or self discharge. The ability of the patient to make an informed decision must be assessed and documented. If the patient is assessed as competent ensure they are discharged with a responsible third party and appropriate discharge advice is provided and documented. In the non competent patient further assistance from police or other agencies may be required. RAN safety is a priority.
- Be critical in your observation to avoid underestimation of underlying pathology
- Check level of consciousness at least hourly; if asleep, the person must be roused; do not assume the person is deeply asleep – they may be unconscious
- Check airway frequently to ensure it is not obstructed

Cervical collars

page 1 of 2 Version: 4 Reviewed: December 2017

It is important to fully immobilise the spine of a potentially spinal cord injured patient so that no further injury occurs, as the fracture or other injury sustained may be unstable.

Remember that a cervical collar alone does not immobilise the cervical spine. If the neck needs immobilising then the whole spine needs immobilising. The use of a spine board, cervical collar, rolled towels each side of the head and strapping is required for full spine stabilisation and immobilisation. The head should not be independently restrained.

Spinal immobilisation with neutral alignment may not be possible in a patient with a diseased vertebral column with associated anatomical deformity and should be modified accordingly (position of comfort).

The unique primary purpose of a cervical collar is to rigidly maintain a minimum distance between the head and neck so that any significant movement of one towards the other, and the resulting intermittent compression of the cervical spine it would produce, are eliminated. The upper margin of the cervical collar purchases the head anteriorly where it is inserted under the angle and lateral portion of the mandible, and posteriorly where the back section is inserted and secured below the posterior bulge of the occiput. The lower edge of the collar, when properly secured, sits firmly on the shoulder girdle and portions of the upper rib cage. Due to its rigidity and the minimum thickness between its outer edges and the underlying bone, the collar transfers any unavoidable loading from the head through the collar to the torso (or from the torso through the collar to the head), instead of the neck.

Using the collar

Most brands of rigid collar measure using similar techniques. There are two main types of collar:

- a series of separate collars in different sizes to fit all people
- or
- one size collar that can be configured to each of the different sizes by using snap locks to change the height of the collar

The collars come packed flat and need to be formed into a collar shape – practise this before use!

Measuring patient for collar

- Proper sizing is critical for good patient care. Too short a collar may not provide enough support, while too tall a collar may hyperextend. The key dimension on a patient is the distance between an imaginary line drawn across the top shoulders, where the collar will sit and the bottom plane of the patient's chin.
- Do not adjust the selected collar on the patient.
- Do not rely on a collar alone to properly restrict the motion of a patient's cervical spine.
- There are a number of different rigid collars available and as they have different sizing measures you will need to follow the instructions provided with the type of collar you have available.

Fitting the collar

Prepare the patient

- Ask patient not to move head or neck by getting patient to focus on a fixed distant object in current line of sight
- Remove any jewellery which may cause pressure once collar is fitted
- Move or remove restrictive clothing from around the neck

Position self

- Stand or kneel beside or behind the patient to get into a stable position
- Position assistant (if available)

Inform patient

- Ensure the patient knows and understands what you are intending to do
- Advise patient to report any changes in symptoms

Align head and neck in neutral position

- Gently rotate head to midline
- Gently move head until eye level is perpendicular to coronal plane of body

Cervical collars

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Select correct collar by sizing as instructed

Prepare collar

- Pre-form collar
- Flex collar to form a round shape

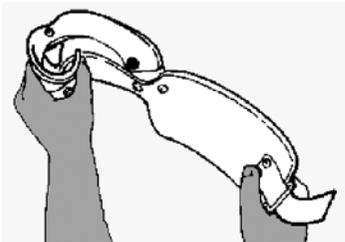
Apply collar

- Ensure patient's head is in neutral position & manually stabilised
- Position the chin piece by sliding the collar up the chest wall
- Make sure the chin is well supported by the chin piece and that the chin extends far enough onto the chin piece
- Recheck the position of the patients head and collar for proper alignment

Secure the collar

- Tighten collar until proper support is obtained
- Ensure collar fits firmly and secure velcro

Figure 13: Preparing a cervical collar



If patient is supine

- Slide the back portion of collar behind patient's neck (fold velcro inward)
- Once the Velcro loop is visible, position chin piece and attach Velcro so as to prevent turning patient's head/neck

Figure 14: A fitted cervical collar



Check

- Is it applied directly to the skin and not over clothing?
- Is the chin sitting down properly – not slipping down inside, or jutting over the rim of the chin piece?
- Is the neck in neutral position - select smaller or larger size if collar causes patient's neck to hyperextend or flex forward?
- Is the patient reasonably comfortable:
 - correct sizing
 - correct alignment
 - no pressure on soft tissues of neck
- When collar in place, **leave in situ**
- Any problems? If so, remove and start again

Chest decompression (adult & paediatric)

Version: 7 Reviewed: December 2018

Needle decompression is an emergency life saving procedure to let out air trapped in the pleural space, causing a tension pneumothorax, which will kill the patient if not relieved.

Signs and symptoms of a tension pneumothorax include:

Early clinical signs

- chest pain/injury
- tachycardia
- dyspnoea, tachypnoea
- diminished breath sounds on injured side

Later clinical signs

- distended neck veins
- tracheal shift (difficult to assess)
- low SpO₂ on supplemental O₂
- stiff bag in ventilated patient

Cardinal signs

- poor perfusion, (increasing heart rate +/- decreasing BP) and/or
- decreasing conscious state in awake patient

Attempt immediate chest decompression

Equipment

- Adult: Air Release System 10G needle. Paediatric 16G long IV cannula (> 45 mm)
- Alcohol swabs, prep solution
- Clear adhesive dressing
- Sharps container
- Sterile gloves
- Protective eyewear

Procedure

- Make patient comfortable (they may need to be sitting to facilitate breathing)
- Locate 2nd intercostal space, in the midclavicular line, on the affected side (figure 15)
- Swab site with alcohol solution
- Hold the needle perpendicular to the skin and insert into intercostal space just above the 3rd rib (avoiding neurovascular bundle) (figure 16)
- Continue to insert the cannula until a 'give' is felt and then slide the catheter over the needle as if inserting an IV
- Listen for air escaping from the catheter
- Remove and dispose of needle safely
- If air or air and blood bubble through the cannula, leave in situ and secure using two clear adhesive dressings on either side
- If no air escapes but copious blood flows through the cannula, then a major haemothorax is present; remove the cannula, cover the site with a clear adhesive dressing and mark site
- If no air is released, remove the cannula and cover insertion site with a clear adhesive dressing and mark site
- Continue to observe and monitor patient
- If patient only partly improves or gets worse, check if cannula has kinked, clotted (flush with normal saline) or consider if now tension pneumothorax on opposite side

If bi-lateral chest decompression decompress **right** side first

Figure 15: Chest decompression point

Insertion site for cannula/
intercostal catheter
(SMART):

- **S** - Second intercostal space
- **M** - Mid - clavicular line (avoiding medial placement)
- **A** - Above rib below (avoiding neurovascular bundle)
- **R** - Right angles to chest
- **T** - Towards body of vertebrae

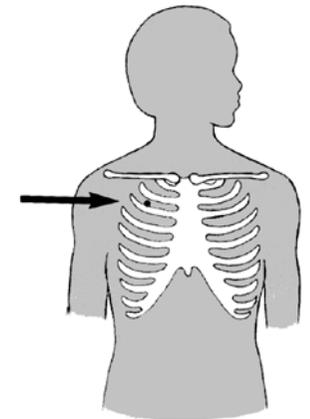
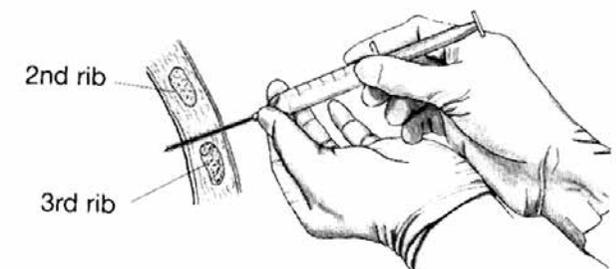


Figure 16: Needle insertion



Coroners Court of Victoria and deaths

Version: 6 Reviewed: December 2017

Victoria has a State Coroner and deaths are reported to a central point, the Coroners Court of Victoria. The Coroners Court of Victoria must be informed if death is associated with any of the following:

- the person dies unexpectedly/suddenly
- the person died from an accident or injury (including falls) or as a result of effects of accident or injury
- the person died in a violent or unnatural way
- the person died during or as a result of a medical procedure (where the death wasn't reasonably expected by the treating medical practitioner)
- the person was 'held in care' immediately before they died
- a doctor has been unable to sign a death certificate giving the cause of death
- the identity of the person who has died is not known, or
- when the cause of death is uncertain
- a reviewable death is required following death of a child (<18) where the death is the second or subsequent death of a child of the parent, guardian or foster parent

Such cases must be reported immediately to the Coroners Court of Victoria, regardless of the time of day or night; it is a 24-hour service.

Key concepts/definitions:

Unexpected death

Any death can be unexpected. A doctor who has been regularly treating a patient may have an opinion about the cause of death, but if the person's death was not expected at that time by the treating doctor, it needs to be reported to the Coroner.

Accident or injury

Even when the cause of death seems clear, the Coroner still needs to find out what happened. For example, a car accident may have been caused by the driver having a heart attack or by a fault in the car. Identifying what contributed to the accident allows preventative measures to be recommended.

Medical procedure

A medical procedure is defined as a procedure performed by (or under the general supervision of) a registered medical practitioner and includes imaging, internal examination and surgical procedures.

Held in care

The definition of 'held in care' is very broad. It includes people in police custody or being taken/attempted to be taken into custody, people in jail, involuntary patients in mental health facilities, and children in juvenile justice centre. This provision also relates to deaths occurring anywhere in Victoria that are caused by injuries incurred while in custody.

If there is any doubt as to whether a case should be reported or not, the advice of the Coroners Court should be sought.

Tel: **1300 309 519**

Role of RAN

- A RAN may verify death (using the clinical determinants on p 105) and record their assessment, name and details in an appropriate record (such as case note, file).
- RANs should report any death in a home or outside a hospital to police, who will, if necessary contact the Coroners Court of Victoria.
- If a RAN arrives at a patient who is found to be deceased, all care should be taken to preserve the scene in case it is deemed to be a crime scene.
- Where a palliative care patient chooses to die at home, it is helpful to advise the family that the police may attend at the time of death. Further, if the death at home at that time is unexpected it is standard procedure for police to be notified to attend.
- Police will arrange transport of the body to the appropriate place as deemed by the Coroners Court of Victoria.
- The clothing remains on the body and is removed on the authority of the police or pathologist. Police advice should then be sought as to the disposal of clothing.
- Identification of the body is carried out in the presence of police. If the body is in a state not suitable for viewing, police should contact the pathologist who will make the body as presentable as possible.
- Sudden Unexpected Death in Infancy (SUDI) is considered reportable (see '**Sudden unexpected death of a child**') (p 119).
- Stillborns and spontaneous abortions are not reportable deaths. Stillborns should be referred to the 'Consultative Council on Obstetric and Paediatric Mortality and Morbidity' (ph: (03) 9096 7022).
- Guidance for the ongoing management of cases involving stillborns and spontaneous abortions can be obtained from the 'Consultative Council on Obstetric and Paediatric Mortality and Morbidity' (ph: (03) 9096 7022).

Verification of Death

Version: 2 Reviewed: December 2016

Verification of death

- Verification of Death refers to 'establishing that a death has occurred after thorough clinical assessment of a body'.
- Registered Nurses can provide verification if in the context of employment and if there is certainty of death. Providing verification of death is not mandatory for Nurses.
- Certification of death must still ultimately be provided by a Medical Practitioner as to cause of death. This falls outside the scope of verification of death.
- Clinical assessment of a deceased person includes 6 clinical elements. These are the 'determinants of death':
 - No palpable carotid pulse.
 - No heart sounds heard for 2 minutes.
 - No breath sounds heard for 2 minutes.
 - Fixed (non responsive to light) and dilated pupils (may be varied from underlying eye illness).
 - No response to centralised stimulus (supraorbital pressure, mandibular pressure or sternal pressure).
 - No motor (withdrawal) response or facial grimace to painful stimulus (pinching inner aspect of elbow or nail bed pressure).

N.B. ECG strip that shows asystole over 2 minutes is a seventh and optional finding that may be included.

Ideally the determinants of death should be evaluated 5 - 10 minutes after cessation of resuscitation to ensure late ROSC does not occur.

- The Verification of Death form should include all findings along with the full name of person (if known), location of death, estimated date and time of death (if known), name of the RAN conducting the assessment and if the treating doctor has been notified.
- Police must be notified in cases of reportable or reviewable death with the attending crew remaining on scene until their arrival. Cases of SIDS are considered reportable.
- A reportable death would include unexpected, unnatural or violent death, death following a medical procedure, death of a person held in custody or care (alcohol or mental health), a person otherwise under the auspice of the Mental Health Act but not in care or a person unknown.
- A reviewable death is required following death of a child (< 18 years) where the death is the second or subsequent death of a child of the parent, guardian or foster parent.
- The original Verification of Death form should be left with the deceased and the copy attached to the printed PCR.

Crisis intervention

page 1 of 2 Version: 4 Reviewed: December 2017

What are the general characteristics of a crisis?

A crisis can be defined as a sudden and unexpected event for which the individual, family or group are unprepared. Coping mechanisms are stretched beyond normal. These events are usually short in duration and have the potential to produce dangerous, self-destructive or socially unacceptable behaviour.

What are the precipitating factors?

Fear and anxiety are basic emotions experienced in an emergency. This may be intensified by pain, alcohol or other drugs, head injury, previous emotional or psychiatric problems and unavailability of meaningful, adequate support systems.

What are the goals of crisis intervention?

There are three important goals of crisis intervention:

- shield the person from additional distress
- assist the person and their family to organise and mobilise available resources
- return the person and their family to pre-crisis level of functioning.

How do you assess a crisis?

The signs and symptoms of a patient who is deteriorating in a crisis situation may include:

- agitation
- hyperactivity or inactivity

- rapid or slow speech, may be characterised by altered vocalisation
- gastrointestinal upset
- staring into space
- wandering about aimlessly
- denial of a problem
- mental confusion.

High priority factors in assessment

- Is there potential for harm for yourself or other clients?
- Is the patient's life or any part of their body in danger?
- Is there a need for immediate use of physical/chemical restraints?

Secondary factors in assessment

- What is or seems to be the problem?
- Are there others involved in or near the scene of danger?
- Consider that a criminal situation may also exist.

How to intervene

- Communicate with the patient using verbal and non-verbal methods. This is the key tool in crisis assessment after physical and safety needs have been met.
- Good communication allows the patient to be accepted as an individual. Do not attempt in-depth analysis – deal with the issue at hand.

Safety strategies to use

- **Protect** yourself by remaining near exits; do not position yourself in a corner of a room or near equipment that may be used as a weapon.

- **Never** take unnecessary risks, attempt to disarm the patient or attempt to restrain the patient without an adequate number of trained personnel.
- **Wait** until the situation has calmed down before attempting to touch the patient.

Communication strategies that may be useful

- Impart a controlled, calm, non-judgmental attitude to the patient.
- Show sensitivity when dealing with your own, and the patient's, verbal and non-verbal communication.
- Listen carefully, focus on the main problem, and address other problems one at a time.
- Never promise anything that you cannot deliver, do not argue nor moralise with a patient.
- Do not take the patient's emotions or behaviour personally; it is not necessary to be angry because the patient is angry.
- Allow the patient to adequately express themselves and inform them of what you are doing and why.
- Ask for help if an impasse occurs or if the situation becomes too tense and you feel you are unable to handle the situation physically, emotionally or clinically. Consider calling specialist crisis intervention personnel, if available. Take your time unless a medical emergency exists or there is physical danger to self or the patient.
- Encourage information sharing and help from the patient's family and friends where possible.

Bush Support Line
Tel: 1800 805 391

Crisis intervention

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Common factors in all intervention

- Remain practical and consider immediate needs through an action/goal oriented approach.
- Involve the patient in the intervention and continually reassess the situation to make sure the most important needs of the patient are being met.

Follow up for staff

- Use defusing/debriefing support that is available. Take the time to talk about the incident and your feelings with supportive colleagues, friends or family.
- Ambulance Victoria staff support line is available to all RANs and their families. Services include peer support, counselling, chaplains and can be contacted 24/7 on 1800 MANERS

Crisis counselling – peer support service

Where RANs are exposed to critical incidents or require psychological/emotional support, the following avenues are available:

- **AV Peer Support and Ambulance Counselling Unit** - 1800 626 377
- **Road Trauma Support Services Victoria** – 1300 367 797 (and for members of the public).
- **Bush Support Line** – 1800 805 391

Remember: No matter how well you know someone, people's reactions may be different from what you expect in a crisis.

1800 MANERS
(1800 626 377)

- 1 PEER SUPPORT**
- 2 VACU COUNSELLING LINE**
- 3 EMERGENCY SERVICES CHAPLAIN**
- 4 HEALTH, SAFETY & WELLBEING (INCLUDING WORK COVER)**
- 5 POLICE STATEMENTS & COURT ATTENDANCE**

This service is available to all employees and immediate family members, including ACOs and CERTs.

employeesupport@ambulance.vic.gov.au

Bush Support Line
Tel: 1800 805 391

Debriefing/defusing

page 1 of 2 Version: 1.1 Reviewed: December 2017

This information is a brief overview only. Debriefing requires an experienced facilitator with appropriate training.

What is debriefing/defusing?

Debriefing and defusing are processes initiated after a critical incident, designed to reduce potential short or long-term problems. A critical incident refers to any situation that causes the individual to experience unusually strong emotional reactions, which may affect them now or later. These can range from natural disasters to traumatic patient deaths or multiple casualty incidents.

Defusing

Defusing is a shortened debriefing (30 minutes) that is held within eight hours of a critical incident. Defusings tend to reduce the impact of an event, are less structured, and facilitate a prompt return to normal activities.

Aims of defusing

- Reduce the need for formal debriefing.
- Enhance a formal debriefing, if required.

Debriefing

Aims of debriefing

- Vent feelings and decrease tension.
- Normalise reactions and educate in strategies to deal with them.
- Assist with practical strategies and support to promote recovery.
- Assess and refer those at risk of developing long-term reactions.

Organising a debriefing

Debriefings should only be conducted by those who have had appropriate training, both in debriefing, group work and recognising those who need referral for ongoing support. This could be any member of the health team. A debriefing usually takes place 1–3 days after the critical incident; delays result in hazy memories and more complex reactions.

Debriefing requires a quiet room, free of interruptions, and should include **all those directly** involved (excluding children, family members of patients/victims, media and management who do not have a direct role). Debriefings may take several hours to conduct, so refreshments should be available in the room.

Tips for debriefers

- Mirror the group's mood to help establish rapport.
- Do not allow any individual to dominate (including yourself), even if long silences sometimes result.
- Keep participants within the bounds of debriefing – steer away from extraneous issues.
- Deal only with emotional/psychological issues. Operational problems and apportioning blame are not part of a debriefing.
- Help the group move through each phase in unison – draw in the reluctant, as able, and refocus on the process to ensure participants have the opportunity to vent all feelings.

The debriefing process

Phase 1: Introduction

- Introduce participants, explain purpose and process, and set guidelines.
- Stress confidentiality, encourage involvement and caution to avoid judgments.
- Advise that emotions can be triggered and that this is normal.
- Stress that participation is at all times voluntary.

Phase 2: Facts

- Summarise the incident and sequel.
- Ask each person to explain their role, actions and impressions.

Phase 3: Thoughts

- Ask participants what they were thinking during the incident.
- Ask participants - what thoughts they would like to erase.

Phase 4: Feelings

- This phase may require little input from the facilitator except for 'Tips' above. It is also the point at which emotions can surface most readily.
- Ask participants how they felt during the incident, what was worst for them, and what their reaction was to sights, smells, sounds and so on
- Ask how they now feel.

Debriefing/defusing

page 2 of 2 Version: 1.1 Reviewed: December 2017

Phase 5: Symptoms

- Share the descriptions of common symptoms. This can, in itself, be most relieving.
- Ask participants about unusual things they experienced during and since the incident.
- Ask what others would say about participants' behaviour since the incident.
- Ask about sleep or other changes since the event.

Phase 6: Teaching

- Provide information on normal reactions to critical incidents – a handout to read later is useful.
- Share ideas on dealing with reactions, such as insomnia.

Phase 7: Re-entry

- Summarise reactions and the value of sharing these.
- Re-emphasise confidentiality.
- Emphasise recovery, learning and growth.
- Provide information on further support.
- Ask if there are further questions, or issues to be taken to management.
- Thank participants for their involvement.

Consideration should be given to individual follow-up and referral as required, to debriefing the debriefer, and to management and operational issues.

Conducting a defusing session

The broad guidelines for debriefing still apply, however, the phases are not followed with any formality. The questions asked by the facilitator will be:

- What happened?
- What were the issues (not personalities or behaviour of others)?
- How are you feeling now?

Reactions should be discussed and normalised, if appropriate, and practical advice provided about dealing with reactions.

Advantages of debriefing

- Demonstrates that the organisation recognises and cares for its staff members. This assists greatly in staff motivation.
- Staff are viewed as human and not 'super RANS'.
- Assists in creating and maintaining supportive interpersonal and team relationships.
- Assists RANs to express their ideas and feelings.
- Creates awareness that reactions are often shared by colleagues.
- Facilitates a process whereby work-orientated stress is being managed in the workplace rather than at home where it could be destructive.

ECG transmission (Zoll X) and alternate 12 lead placement

Version: 1 Reviewed: December 2018

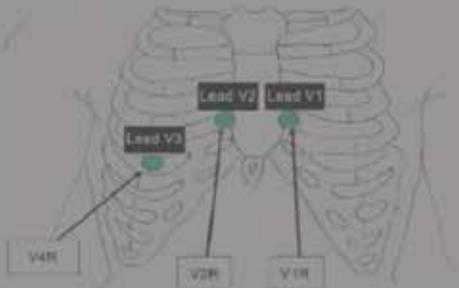
ECG TRANSMISSION (ZOLL X)

- Place limb and chest leads on patient
- Enter 12 lead menu and enter patient details: Age, Gender, Name (Surname) and ID (case number),
- Exit details menu and 12 lead will record
- If STEMI is the result, press hard button next to the 12 envelope on left side of screen
- Choose destination hospital from list and hit send
- Ensure transmission successful by watching top left corner of screen. 'Transmission successful' will appear in green

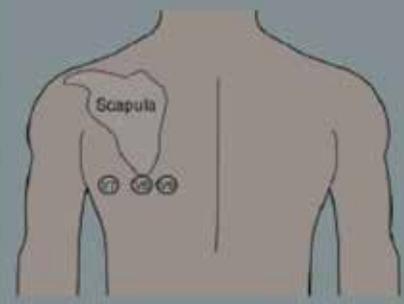
RIGHT SIDED AND POSTERIOR 12 LEAD PLACEMENT

RIGHT SIDED AND POSTERIOR 12 LEAD

SEQUENCE AND PLACEMENT OF ECG LEADS			I Lateral	aVR	V1 Septal	V7 Posterior
V4R	Use V3 lead	Is placed in the 5th intercostal space mid-clavicular line on the right side of the chest	II Inferior	aVL Lateral	V2 Septal	V8 Posterior
V8	Use V5 lead	Is placed at the apex of the scapula, 5th inter-costal space	III Inferior	aVF Inferior	V4R (R) Ventricle	V9 Posterior
V7	Use V4 lead	Is placed inline with V5 lead in the posterior or axillary line	REMEMBER TO RE-LABEL THE V LEADS ONCE YOU HAVE PRINTED THE ECG			
V9	Use V6 lead	Is placed to the left of the spine inline with V5 lead				



Version 4.0
January 2018



Scapula

When to record a right / posterior lead:

Evidence of an inferior & / or lateral STEMI with septal ST depression

Intravenous cannulation (adult & paediatric)

Version: 5 Reviewed: December 2017

A general guide

- Technique will vary according to manufacturer's recommendations and this serves as a general guide only
- Antiseptic hand washing
- Gloves and protective eyewear worn
- Ensure sharps container is in an appropriate location enabling safe and rapid sharps disposal
- Aseptic technique must be used during insertion
- New cannula per attempt
- Documentation should include
 - RAN's name, date, time, cannula size and site of insertion

Select intravenous site

- The cephalic and basilic veins in the lower arm and the vein in the dorsum of the hand are traditionally used as they are usually large and straight. The antecubital fossa site is useful in cardiac arrest and hypovolaemia as it is a larger vein and more proximal to the central circulation.
- Initial insertion attempts should begin with distal veins and progress up the limb.
- Ensure patient is comfortable.
- Place patient's limb in a dependant position and apply tourniquet to upper limb (≤ 10 cm above site of insertion).
- Ensure arterial blood supply is not occluded.
- Instruct patient to open and close fist and/or tap gently to distend veins – select palpable vein.
- Try to avoid veins at points of flexion, or where there is bruising, infection or inflammation.
- Sites contraindicated – arm same side as radical mastectomy; A-V fistula.

Prepare skin by cleansing with an alcohol/chlorhexadine solution and allow to air dry. Utilise the aseptic no touch technique.

- Select cannula size appropriate for available vein and intended use that can be confidently inserted – e.g. 20 G in adult dorsal vein for administration of IV analgesia; 18 G is a good general purpose, 16 G in adult antecubital fossa for rapid fluid administration, 22–24 G for a child.

Stabilise the vein by applying traction to the skin with the thumb of non-dominant hand approx. 2 cm distal to insertion point.

Warn patient of needle prick, if conscious.

Puncture skin with the needle bevel up, 10–20° angle to the skin, until a sensation of loss of resistance is felt.

- Enter the vein on the top or side.
- Check for blood flow into cannula hub.
- Reduce needle angle to skin and advance a further 4–5 mm, to ensure the cannula, not only the needle, is in the vein.
- Advance the cannula over the needle into the vein.
- **Release tourniquet**
- Apply fingertip pressure at the distal end of the cannula to prevent extravasation of blood (avoid touching insertion site).
- **Remove needle** and immediately safely dispose in a sharps container.
- If cannulation attempt fails do not attempt to reinsert the needle into cannula – remove entire device and start again with a new cannula.
- Apply pressure to puncture site.

Connect to IV line or reflux valve

- Check patency by flushing with 5–10 mL **sodium chloride 0.9%** or IV Infusion.
- **Apply clear occlusive dressing and further secure with tape.**
- **Check IV site regularly** for signs of leakage, phlebitis or swelling.
- All IV bungs require 6-hourly **sodium chloride 0.9%** 5 mL flushes to maintain patency.

The paediatric patient

The RAN may cannulate paediatric patients where there is a vein visible – currently this relates to the RANEGs for paediatric cardiac arrest (p 26) (for the administration of adrenaline IV) and hypovolaemia (p 55) (for administration of sodium chloride 0.9% IV)

- Paediatric veins may be difficult to see as small children have additional subcutaneous fat.
- Cannula size required for smaller veins is usually 22–24 G. Due to smaller diameter and lower blood pressure the backflow will be slower. Consider priming the cannula with sodium chloride 0.9% to assist in detecting flashback.
- It is essential to secure the IV cannula well to prevent accidental dislodgement. Arm boards and tape may be necessary. Leave insertion site visible.
- Sites for IV access include the back of hand, forearm and cubital fossa.
- Continuous monitoring of fluid volume administered and infusion site is required to prevent complications – if possible use a burette to accurately regulate the amount of fluid administered. (Remember that children have a circulating blood volume of 70–80 mL/kg).

Laryngoscopy – inspection of upper airway

page 1 of 2 Version: 2 Reviewed: December 2017

Introduction

Direct laryngoscopy is a procedure to view the inside of the larynx and associated structures using a rigid laryngoscope. Different types of laryngoscopes include the Penlon laryngoscope – a plastic one piece laryngoscope with curved adult blade; those with battery powered light (bulb) or a fiberoptic light source.

There are two main types of laryngoscope blades – curved and straight. The curved blade is most often employed and is designed to slip between the epiglottis and the base of the tongue. Straight blades are usually used for infants, and exposes the vocal cords by lifting the epiglottis itself.

Indications for use of laryngoscope and/or Magill's forceps

- Choking – to remove foreign body in an unconscious patient
- Cardiac arrest – for direct airway inspection
- LMA – to check position of LMA cuff if ventilation is difficult or inadequate
- The patient who is in an altered conscious state without a gag reflex requiring inspection of an airway.

Precautions

- Epiglottitis
- Croup

Technique

Position self and patient

- Position patient supine
- Position self behind patient's head

Do not lever laryngoscope on the teeth.

Prepare equipment

- Check laryngoscope:
 - bulb secure
 - light on
- Ensure pad/towel available if required
- Have suction equipment available
- Place laryngoscope alongside left of patient's head
- Suction equipment placed on right of patient's head

Prepare patient (Figure 17)

- Elevate patient's head using small pillow, folded towel or equivalent
- Gently apply moderate extension of the head and jaw support
- Maintain 'sniffing' position

Insert laryngoscope

- Right hand supporting and steadying patient's head
- Pick up and hold laryngoscope lightly by the handle with the left hand, thumb along handle (Figure 18)
- Gently insert laryngoscope blade down extreme right side of mouth (Figure 19)

Inspect upper airway

- Check for foreign body in oropharynx:
 - look right and left
 - use suction if required

Sight vocal cords

- Gradually move blade in, keeping tongue on left at all times (Figure 20)
- Try to position tip of blade in vallecula groove
- With thumb along the line of handle exert gentle lifting pressure along axis of handle

Check that the:

- Airway is clear
- Vocal cords are in view



Figure 17: Position the head



Figure 18: Holding the laryngoscope



Figure 19: Insert laryngoscope down right side of mouth



Figure 20: Gradually move blade in, keeping tongue on left at all times



Figure 21: Ensure bend of Magill's forceps follows the natural curve of laryngoscope blade: maintain view

Laryngoscopy – inspection of upper airway

page 2 of 2 Version: 2 Reviewed: December 2017

Removal of a foreign body from the upper airway using Magill's forceps

Foreign body sighted...

Prepare Magill's forceps

- Pick up forceps in right hand:
 - grip with thumb and third or ring finger
 - use index finger to steady forceps

Introduce forceps

- Place tip of forceps in groove of laryngoscope blade.
- Ensure bend of Magill's forceps follows the natural curve of laryngoscope blade: - maintain view (Figure 21)
- Advance tips of forceps along blade with tips closed

Remove visualised impacted foreign body

- Keep foreign body in sight
- Move tips of forceps to within 2 cm of the foreign body
- Open tips carefully
- Manoeuvre tips to surround the foreign body
- Carefully grip and remove foreign body gently

Check

- Re-inspect airway
- Ensure vocal cords visualised and clear

Assess

- Check respiratory status
- Check vital signs

Failed removal of foreign object

- May require forced ventilation via BVM

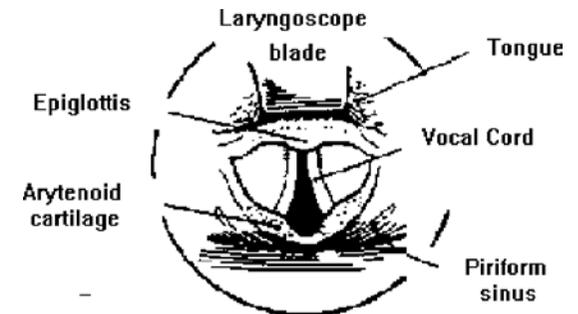
Post procedure care

- Administer O₂
- Assist ventilation as required
- Position patient lateral if still unconscious

Complications related to trauma from laryngoscopy

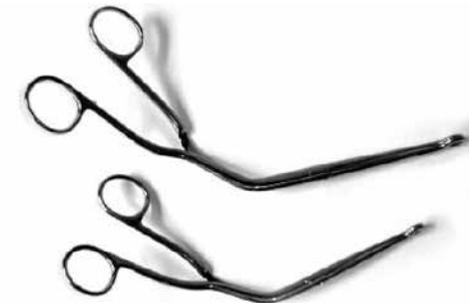
- Teeth – avoid with proper technique
- Soft tissues (bleeding) – usually avoidable with proper technique
- Oedema – usually due to repeated attempts
- Equipment failure – verify functional pre procedure

Figure 22: View of vocal cords



Source: Prazeres 2002

Figure 23: Magill's forceps



Magill's forceps – adult (top) and child (bottom) are long, curved forceps designed to reach into the posterior pharynx. Ideally suited for grasping and extracting a foreign body visualised during laryngoscopy.

Mental health issues in emergency settings

page 1 of 2 Version: 4 Reviewed: December 2017

A mental health emergency is when a patient experiences thinking or behaviour that is significantly challenging, and/or there is risk of harm to themselves or others.

Caring for any patient should be professional and empathic, using clear and attentive communication skills.

The arrival of a patient with mental health issues requires careful assessment.

Mental health patients often present requiring assessment following an overdose, acts of self-harm or demonstrating behaviours that are unusual or difficult. Patients may not always disclose their feelings and thoughts. They may be present as disinhibited behaviours, especially if under the influence of drugs or alcohol.

Safety

Where safety of staff or other patients is at risk, staff and patient safety must take priority and a security response, such as calling the police, may take place prior to clinical assessment and treatment.

Patients encompassing the entire spectrum of acute illness, injury, mental health problems and challenging behaviours may present to your facility. Pain, anxiety or substance use in patients, or their relatives, may provoke aggressive behaviours. This may not necessarily be a mental health condition but a reaction to their situation.

All patient reception areas should provide a safe, non-threatening environment, and have staff who have received basic training in minimisation of aggression.

Safety tips

- Seek help from other staff, family or the police.

- If the person is aggressive do not approach them alone.
- Talk to the patient in a quiet, well lit place (if possible).
- Always ensure that the patient is not between you and the door.
- Use space to protect yourself.
- Ensure the environment is safe and there is nothing that can be used as a weapon, for example, a sharps container.
- Talk to the person in a calm manner, and let them know you are there to help.

Look for:

- Signs of injury or self-harm
- Signs of impaired consciousness
- Hyper/hypoactivity
- Thought disorder
- Disturbed mood
- Signs of hallucinations
- Unusual behaviour

Enquire about:

- The start of the problem
- Use of alcohol or drugs
- Medications
- Past mental and physical health
- Any thoughts/attempts of harming self
- Any thoughts/attempts of harming others
- Hallucinations or thought disorders

If possible:

- Do vital signs and physical examination to detect/exclude a physical cause

- Consult early with your local regional mental health triage

If a person is suicidal:

1. Assess and ensure safety

- Is the person safe to wait?
- Is the person in obvious severe distress?
- Is the person affected by drugs or alcohol?
- Is the person a current patient of a mental health service?
- Is there a risk of danger to self or others?

2. Establish rapport

- Engage with the person; be non-judgmental, respectful and professionally empathic. Use open body language.

3. Collect collateral information

- Document and pass this information on to the next attending clinician.
- Ask accompanying friends or family members to remain available.
- Record a description of what the person is wearing to aid identification if the person leaves.

4. Assess suicide risk

- Apply the *Victorian emergency department mental health triage tool* (as per the Australasian triage scale p 121).
- For an initial, rapid suicide-risk assessment enquire about:
 - duration of the suicidal thoughts
 - any history of previous suicide attempts
 - recent help-seeking behaviours
 - the existence of a suicide plan
 - access to means to complete the plan.

Mental health issues in emergency settings

page 2 of 2 Version: 4 Reviewed: December 2017

5. Take action

- Provide continuous or one-to-one supervision and urgent assessment for acutely suicidal persons.
- If safe to do so remove lethal means of self harm such as pills or ropes. If any concern for personal safety activate duress and retreat from the scene.

6. People who do not wait to be seen

- If a person at risk does not wait to be seen, make every effort to contact the person (and their next of kin) and ask them to return for a proper evaluation.
- Where applicable, notify the police.
- Alert the person's GP or psychiatrist about the person's departure.
- Alert the local mental health service and provide referral.

All patients who have attempted suicide should be discussed with a mental health triage clinician.

Contact the regional mental health triage service in your area. Regional phone numbers are listed on p 175.

Mental status assessment

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

Adapted from Bloch & Singh 2007

Mental state examination	Factors to consider
Physical	
Appearance and general behaviour	What is the person doing and wearing, what is their general hygiene and posture, and how does the person look? How is the person behaving and how do they appear?
Motor activity	Observe overall level of movement (psychomotor retardation or agitation). A person who is suicidal may be agitated, or exhibit slowing of movements, speech and thoughts.
Emotional	
Attitude/ demeanour	Is the person closed, guarded or suspicious? What is their degree of cooperation and attentiveness, level of eye contact and tone of voice. A person who is suicidal may be distrusting or disengaged, and unwilling to disclose painful material.
Mood and affect	Mood can be observable or articulated, including depressed or euphoric mood, agitation, irritability, suspiciousness and fear. Stability of mood can also be noted. Affect may be exaggerated (fully animated or overly strong emotional reaction), euthymic (normal), restricted (limited emotional range and intensity), blunted (minimal variation) or flat (absence of emotional expression).
Cognitive	
Speech and language	Speech can be described in terms of volume, rate, idiosyncratic symbols or other odd speech and tone (include any accent or stuttering).
Disorders of perception	A clinician needs to ask about hallucinations, including whether there are command-type hallucinations. The enquiry needs to be expanded to include what the person will do in response to these command hallucinations, particularly those linked with dying or delusional beliefs. Does the person feel controlled or influenced by external forces, or distracted by internal stimuli?
Thought form or process	This refers to the organisation of a person's thoughts (logical/linear, circumstantial, tangential, flight of ideas, racing, loose associations, derailment, poverty of thought or thought blocking).
Thought content	What are the basic themes preoccupying the person; e.g. suicidal or homicidal ideation, paranoia, persecutory thoughts, delusions, ideas of reference, obsessions, compulsions? If there is suicidal or homicidal ideation, is there a plan, intent?
Insight and judgement	How much is the person aware of their illness and/or need for treatment/ hospitalisation? A strong lack of insight can be an important indicator of unwillingness to accept treatment.
Memory, orientation, intelligence, attention and concentration	Is the person oriented and coherent? Are attention, concentration and memory intact? Is the person able to focus their cognitive processes upon a given target?

Pressure immobilisation technique

Version: 3 Reviewed: December 2018

Pressure bandage application

The following assumes a bite to a limb.

- Select a self adhering bandage. If not available any broad pressure bandage can be used (eg crepe).
- Apply short dressing over and around the wound site for several turns.
- Apply second bandage commencing from the distal point of the limb.
- Apply bandage firmly but not excessively. The firmness should equate to that of a sprained ankle.
- Continue bandaging back up the limb in spiralling fashion as proximal as possible
- Mark the bandaged limb approximately where the bite location is to assist with later swabbing and toxin identification

Note: at no time should a tourniquet be utilised in snake bite management.



Immobilise limb

The principle is to immobilise the affected limb. The precise method can vary greatly. The following are anatomical options:

For an arm

- Tie a broad fold bandage around the upper arm and chest
- Repeat a similar bandage for the lower arm and abdomen
- Repeat a similar bandage for the hand against the leg.

For a leg

- Tie a broad fold bandage around the upper thigh and opposite leg
- Repeat a similar bandage around the knee and opposite leg
- Repeat a similar bandage for the lower leg and opposite leg
- Repeat a similar bandage for the foot against the other foot
- Alternatively, immobilise the leg in a traction splint but **without** traction applied
- Where possible position the limb dependant.



Non limb envenomation

Apply direct pressure to the bite site.

For urgent advice contact:
National Poisons Centre
Tel: **13 11 26**

Pulse oximetry

Version: 2 Reviewed: October 2017

Definition

The pulse oximeter non-invasively measures the saturation of peripheral oxygen (SpO₂) in the haemoglobin of arterial blood and is also a pulse monitor.

Indications

The pulse oximeter is used to detect hypoxaemia and to monitor the effectiveness of oxygen therapy. Monitoring can be continuous or intermittent.

Function

The pulse oximeter determines SpO₂ and heart rate by measuring the absorption of selected wavelengths of light as it passes through tissue in the finger or earlobe. The light generated in the probe source passes through the tissue and is detected by the photo-detector, which converts it to an electrical signal. This electrical signal is amplified to SpO₂ and heart rate values. The photodetector picks up light modulations made by pulsatile tissue (the blood, as it passes through the arterioles). Oxyhaemoglobin allows more light to pass through it than does deoxyhaemoglobin. The value obtained reflects how well all red blood cells are saturated with oxygen.

What is SaO₂?

Arterial oxygen saturation is defined as the ratio of oxygenated haemoglobin to the total haemoglobin. Haemoglobin is in the red blood cells either as oxyhaemoglobin (HbO₂) or reduced haemoglobin (1-Hb with the O₂ removed).

Arterial oxygen saturation is referred to as SaO₂, or when measured non-invasively as SpO₂, with peripheral monitoring providing a high degree of accuracy for saturations between 70-100%.

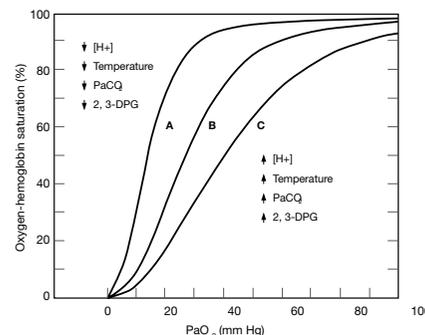
Using the oximeter

Select either a finger probe or ear probe and apply. Avoid nail polish, poorly perfused digits, or use in strong light sources.

Relationship between SpO₂ and PaO₂

O₂ saturation and partial pressure of oxygen are not synonymous. The relationship is determined by the oxyhaemoglobin dissociation curve. Conditions such as changes in acid-base balance and body temperature alter the relationship, which in turn alters the availability of oxygen to the body's tissues. Normally, saturation of oxygen should be above 95%, which is achieved when PaO₂ is above 80 mmHg. These values are normal for a well person without an acute illness or injury, which may increase their oxygen demands. By studying the diagram, we can see that as our PaO₂ falls, even a small decrease in PaO₂ causes a rapid drop off in our saturation levels. So, this is clinically important to us because we can see that by the time our saturation monitor alarms or indicates a drop in saturation levels, the decrease in PaO₂ may be quite large. So always look at your patient and assess clinical signs carefully – signs of hypoxia may be apparent before the saturation levels fall.

Figure 29: Oxygen-hemoglobin dissociation curve



B, Normal. Abnormalities that result in an increased, A, or a decreased, C, affinity of the hemoglobin molecule for oxygen are shown beside the outer curves.

Remember: The saturation monitor detects hypoxaemia – low levels of O₂ in the blood. It is the clinician who detects hypoxia – which is not enough O₂ for normal tissue function. You may detect hypoxia signs and symptoms before the machine records hypoxaemia.

Cautions:

1. High level of ambient light, such as from procedure lamps and infrared lamps can affect readings of SpO₂.
2. Fingernail polish and dirt may interfere with the light from the probe source and make readings questionable. Place probe sideways on finger, or use ear probe.
3. High levels of carboxyhaemoglobin (from carbon monoxide poisoning) can cause false high readings.
4. Patient movement may lead to disrupted signals and readings.
5. The reading is not reliable in conditions of poor perfusion. In such conditions an ear probe may be more useful.
6. Oximeter readings can be inaccurate below 70%.
7. Saturation readings are not accurate unless there is a good pulse wave and arrhythmias may not provide uniform pulsations.
8. The pulse oximeter measures oxygenation. It does not measure ventilation, CO₂ levels or work of breathing.

Remember: Always trust your clinical judgement – if your patient appears hypoxic, give O₂ and reassess regardless of the oximeter reading.

Sexual assault

Version: 4 Reviewed: December 2017

Priorities of care

- Treat life-threatening emergencies.
- Provide emotional support for the patient.
- Ensure privacy.
- Collect evidence – all clothing must go with the patient.

Leave clothes on if possible. If clothing needs to be removed:

- wear gloves
- try to remove clothing intact
- place each item in a separate paper bag
- if the clothing needs to be cut, record this.

Gloves: must be worn at all times to prevent contamination of evidence. Please explain to the person why this is necessary

- Where practicable minimise loss of evidence - encourage patient not to bathe, shower, urinate, defecate, eat, drink or clean teeth.
- Notify police.

Remember: A child may not present as a victim of sexual assault but with a cluster of other signs and symptoms. Referral to your local Department of Human Services (Child Protection Unit) is mandatory.

Nursing interventions

- Treat any life-threatening emergencies and stabilise the patient.
- Provide emotional support for the patient, such as holding hand and/or talking to them.
- Provide privacy and a safe environment. Remain with the patient until transfer to a facility that can deal with evidence collection.
- Ask whether the patient would like a support person present (family/friends).
- Mandatory reporting and referral may be relevant in some cases. The Centre Against Sexual Assault (CASA) will provide real time, case specific advice to RAN's.

Assessment

- Observe the patient's general emotional state.
- Note any physical injuries.
- Take a history of the incident if the patient volunteers information.
- Record the incident in patient's own words.
- Record any evidence of physical violence – note (or photograph with consent) bruises, scratches, state of clothing and any other injuries on patient's body.
- Evidence should be collected as guided by police or the Centre Against Sexual Assault (CASA).

Centre Against Sexual Assault (CASA)
Tel: 1800 806 292

Sudden and Unexpected Death of an Infant or Child

page 1 of 2 Version: 1 Reviewed: December 2014

The information in this guideline relates to deaths without an obvious cause (possible SIDS). When there is a different or more obvious cause of unexpected death see Coroners Court of Victoria and deaths (p 104)

Initial Response

- **Attempt resuscitation and other lifesaving procedures if appropriate, and continue until the Ambulance Paramedics arrive.** Parents need to feel that everything was done for their child.

- **In all cases** whether or not there are suspicious circumstances, the RAN will request Police attendance. Transport will not take place until Police advise that this can occur. Professional discretion when interacting with parents or other relatives is required.

- **Explain to the parents that the Police will attend** to gather information for the Coroner and that this is necessary for all sudden and unexpected deaths, regardless of age.

- **Be generous with your time.** Most parents wish to spend time with their child, prior to leaving for the hospital.

- **Other children in the family may need time with their brother or sister.** Even very young children can be included in the family's grieving process right from the start.

- **Offer to telephone another family member, a doctor or a friend.** It is helpful for the family to have the support of familiar and loving people.

- Following other causes of death, consider encouraging the ambulance paramedics to transport the parents and child to an emergency department of a hospital.

- **Outside Melbourne,** families' needs should be treated individually. Ambulance Paramedics and Police consult with the State Coroner's Office on 1300 309 519 (24 hours). Where

possible the family should be taken to the nearest hospital with an Emergency Department.

- **Encourage parents and other children to accompany the child to hospital** where they can spend time, with the support of experienced hospital staff, before taking leave of their child. Most hospital Emergency Departments have a private room for this purpose.

- Some parents may request to go to a different hospital, or stay at the scene with the child until the arrival of the Coroner's contract funeral director. The individual needs and requests of the parents should be respected wherever possible, but the State Coroner's Office must approve of these requests.

What Happens Next

- Keep parents informed about what is happening now and what will happen next.

- If asked, **explain that an autopsy is required by law to try to find the cause of any sudden and unexpected death regardless of age.** Reassure parents that an autopsy is an operation carried out by a pathologist with the same care as an operation on a living person.

- Some parents do not want an autopsy carried out for personal or religious reasons. The State Coroner's Office must be notified immediately of their objection.

- It is unlikely that the Coroner will support the objection to autopsy. **Parents may appeal immediately to the Supreme Court.** However, the Coroner's decision may still be upheld in the Supreme Court.

- **In Victoria, all autopsies for possible SIDS deaths are carried out in Melbourne** at the Coronial Services Centre in Southbank. Transport is at the expense of the Coroner. Infants are returned to their families or the nominated funeral director, usually within 48 hours.

- **Autopsies for other sudden and unexpected deaths which occur in country areas are usually conducted at the nearest regional hospital.**

- **Following a possible SIDS, the paediatric pathologist will ring the parents within 48 hours** with the initial findings of the autopsy. The pathologist undertaking the autopsy after the sudden death of a child from a cause other than SIDS, will probably not ring the parents after the completion of the autopsy.

- **Parents may see, touch and hold their child again after autopsy.**

- **Following a SIDS death, if the family agrees an Event Scene Investigation (ESI) will be undertaken by an Event Scene Investigator** from the Coronial Services Centre at Southbank. The Event Scene Investigator speaks with the parents about their baby's health, bedding and environment, and may take photographs. The Investigator will contact the family to arrange a visit within 24 hours.

- **Following other sudden and unexpected deaths, various units of the Victoria Police will gain information about the circumstances of death.** For example, following a fatal motor vehicle accident, the Accident Investigation Unit investigates the death; following a fire, the Arson Squad investigates. Members of these police units provide information to the family about any subsequent legal procedures.

- The parents **may** be contacted by a nurse from the **Donor Tissue Bank.**

- Explain that, following notification or referral, a SIDS and Kids worker will contact the family. This contact may occur on the day of the death or shortly after.

- **Having gained the parent's permission, please phone Red Nose 24 hour Help Line on 1300 308 307 with the notification of the child's death.**

Sudden and Unexpected Death of an Infant or Child

page 2 of 2 Version: 1 Reviewed: December 2014

Caring for Parents

- **Always use the child's name** unless parents indicate otherwise.
- **Avoid using cliches** such as "At least you have your other children". It is better to simply say "I'm so sorry your child has died" or "It must be awful for you".
- **There is no right way of grieving.** Acknowledge and accept the feelings expressed by the parents.
- **Respect cultural mourning customs.**
- Do not take personally any anger expressed.
- Do not be afraid to show your own emotions, but do not allow them to overwhelm the parents or detract from your ability to help.
- **Having gained the parent's permission, please notify Red Nose on 1300 308 307 of the child's death.**

Remember to Take Care of Yourself

- The death of a baby or young child is extremely distressing to all involved. **Do take a break** if possible before returning to other duties.
- You may need to talk about what you heard and saw, what you did and said, and how you felt. If so, **find a colleague, peer or friend who is a good listener.**
- **Make use of workplace arrangements for support. AV offers free peer support and counselling services to all RANs and their families. The staff support line is available 24/7 on 1800 626 377.**
- **Make use of workplace arrangements for support. Red Nose offers information and support to anyone who has been affected by the sudden and unexpected death of a child from 20 weeks gestation to 6 years of age. Phone 1300 308 307.**

Reproduced from Emergency Responder's Manual 3rd Edition. SIDS and Kids Victoria 2005 www.sidandkids.org

Triage

page 1 of 2 Version: 5 Reviewed: November 2016

Telephone triage

The what and why of telephone triage

Telephone triage is the practice of conducting a verbal interview to assess a patient's health status and to offer recommendations for treatment and referral. The goal of telephone triage is appropriate patient referral and level of care within an appropriate period of time.

Telephone triage is an important strategy for improving access to expert advice in rural or remote areas.

However, there are risks associated with telephone triage. For example, you may be asked to make a nursing diagnosis or provide an opinion of what you think may be wrong. This has legal implications if your opinion is incorrect, and you are able to be held liable for the information given. Other risks include incorrect assessment, incomplete collection of data, caller mistrust or misunderstanding and poor documentation.

Following standard protocols or flowcharts helps minimise the risk of these things happening and reduces the risk to the quality of care delivered to the patient. There should be no problem with duty of care with telephone queries, provided that processes are present to ensure that appropriately skilled staff are handling the calls, and that all calls and advice given are documented.

Performing telephone triage

The process of telephone triage has five main steps:

1. introducing yourself and opening communication channels
2. performing the assessment via interview
3. making the triage decision
4. offering advice according to protocols or established guidelines for care incorporating follow-up plans
5. documenting the call.

Step 1. Introducing yourself and opening communication

- Give your name and title so your patient feels they are receiving information from a knowledgeable person, allowing for trust and openness.
- Have a caring and non-judgemental manner. This improves the amount and detail of information revealed.
- Establish whether the caller has rung previously and if so, how long ago and what advice was given.

Step 2. Performing the assessment via interview

- Establish if the call is an emergency to life or limb by asking about:
 - symptoms
 - age
 - sex
 - breathing sounds
 - level of consciousness.
- Information gained must include demographic data (name, age etc.), baseline health information and current signs and symptoms.

- Listen to what is not said as well as what is said.
- Use experienced staff, so that nursing knowledge and intuition is used.
- Listen for non-verbal cues – sentence structure, pauses, breathing patterns, crying etc. Background noise may indicate what pressures the caller is under.
- If you are not talking to the patient, have them brought to the phone to listen to breathing, coughing etc.
- Remember, the more information collected, the more accurate your nursing diagnosis will be.
- Use open-ended questions; try not to lead the caller.
- Ask the patient to describe their symptoms, not to self-diagnose the cause of the symptoms.

Step 3. Making the triage decision

You are required to make a nursing diagnosis that establishes priorities of care based on the patient's signs and symptoms. A medical diagnosis establishes the cause of the patient's signs and symptoms. RANs do not provide a medical diagnosis.

- Use protocols and guidelines to help you make a nursing diagnosis.

Remember: You are not making a 'diagnosis' over the phone. Decisions are made on acuity of signs and symptoms.

Triage

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Step 4. Offering advice

- Base your advice on acuity of the signs and symptoms.
- Advice may include:
 - calling an ambulance
 - observing at home
 - seeing GP when convenient
 - transferring the call to a GP or other healthcare provider, as appropriate
 - self treatment at home
- Ensure that the caller clearly understands the advice by having them repeat the information back to you.
- Encourage the caller to call back if the condition worsens, or if they have a further issue. Give the caller options if the condition deteriorates or shows no improvement.

When using protocols or guidelines, consider:

- getting a 'general picture' of the patient
- choosing an appropriate protocol to follow the patient's main problem
- determining acuity level of the patient and following the protocol for that acuity level; upgrade if in doubt – do not downgrade
- sound nursing judgement should be exercised

Step 5. Documenting the call

- Be precise.
- Reflect advice given by the protocol followed.
- Include all data and as much information as possible to give a complete patient scenario.
- Consider if the caller wants to remain anonymous.
- If not talking directly to the patient, record details for both the caller and patient.

Telephone triage tips:

- Avoid stereotyping callers or problems.
- Avoid second guessing the caller.
- Do not try to be an expert on everything.
- Avoid absorbing patient/caller anxiety.

- The use of guidelines and protocols assist the RAN in providing advice by:
 - structuring the call and keeping information requests objective
 - problem solving – supporting the RAN through the decision making process
 - helping reconstruct the call and help generate documentation, tracking the decision process and defending the decision made

Remember: Make a nursing, not a medical diagnosis.

Triage - Multi-Casualty Event

Version: 5 Reviewed: November 2016

Multiple casualty triage

Multiple casualty triage principles are applied at the scene where there are multiple patients who are ill or injured. This triage involves a system for readily identifying the urgency of care for each patient.

Multiple casualty incidents

In all cases where the RAN attends confirmed or potential multiple casualty incidents, adherence to safety procedures and the wearing of appropriate personal protective equipment is mandatory.

- Ensure it is safe to approach the area and patient.
- Park the vehicle with regard to safety, vehicle egress and scene protection.
- Be aware of potential or actual risks to your own health and safety.
- If there is actual or a suspicion of hazardous materials contamination follow the procedures identified in the next section.
- On arrival you must notify the Ambulance Victoria (AV) Operations Centre of your arrival and provide an initial situation report (SITREP) using ETHANE.

E = Exact location

T = Type of incident (e.g. RTA, CBR, HAZMAT)

H = Hazards at scene (e.g. powerlines, vapour, spillage)

A = Access and egress

N = Number of casualties (walking, stretcher, deceased)

E = Emergency services at scene and required (e.g. additional ambulance resources and other agencies)

- Role of triage officer
 - Triage to assess the number and type of patients
 - Apply triage tags
 - Allocate the clinical priority for patients
- Commence only immediate life saving treatment, such as clearing an obstructed airway. More definitive treatment can be provided when resources allow.

- The goal of triage in a multi-casualty incident is to achieve the greatest good for the greatest number of patients.
- Initial triage decisions need to be made quickly and safely.
- Triage is dynamic and categories will change.

- Utilise the assistance of bystanders and other emergency services personnel where available and appropriate.
- Direct all walking patients to a designated area.
- Classify non-walking patients into two groups:
 1. Urgent removal: may survive with urgent treatment.
 2. Less urgent removal: injuries that will need hospital care eventually but are not currently time critical by definition, and patients beyond medical intervention in whom treatment may jeopardise the survival of other patients.
- Ensure the use of triage tags if available.
- Direct the first paramedics on scene to the most urgent cases.
- Ensure access/egress for first incoming ambulances, use bystanders to assist with keeping the area clear.

Hazardous materials and contaminated environments

1. Only approach from upwind, remain at least 250 m from incident.

2. Look for identifying marks/symbols, *Emergency procedures guide* (EPG) on containers or vehicles.
3. Contact incident controller (fire service or police) if in attendance, or on-site expert if available. A staging area should be established in a safe location.
4. Request DATACHEM information via AV Communications Centre or CFA on scene.

If identification information is available contact AV Communication Centre or CFA with the following:

Manufacturer's name	
Container	Type, shape, size and markings
Materials	Physical characteristics, behaviour
Transport company's name	
Vehicle registration number	

If the hazard cannot be identified **do not** enter the 250 m perimeter until expert advice from control agency personnel or the incident controller has been provided, and the area declared safe to enter.

Important!

If you don't think hazards, you won't suspect hazards!

Warning signs of hazardous materials exposure may include multiple casualties with similar signs and symptoms, dead and dying animals and insects and suspicious clouds or vapour.

If suspected or actual contamination occurs utilise the nearest water source to wash off contamination and remove outer clothing. These procedures will remove the majority of the contamination.

Triage - Regional & State Health Emergency Response Plans

Version: 5 Reviewed: November 2016

Regional Health Emergency Response Plans (RHERP)

Each rural Department of Health and Department of Human Services Region across Victoria have in place a Regional Health Emergency Response Plan (RHERP). This document complements the state health emergency response plan and forms the basis of any response in which a RAN may be used in connection with a larger incident.

Bush nursing centres have signed an agreement with AV to enable dispatch of RANs to emergency cases in their geographical area

If one or more RAN's are called to assist in an incident involving casualties that is developing or has reached a magnitude that triggers the RHERP the most senior RAN will, until AV paramedics arrive at the incident, be under the direction of the incident controller.

Throughout the period between the arrival of the first RAN and the first AV paramedic, the RAN will be responsible for assessment and triage of casualties. Any request for additional medical assistance will be communicated through the OpCen to the AV duty manager for action. The first AV paramedic onsite will assume the role and responsibilities of health incident commander. A senior AV manager may be deployed to the incident and dedicated to the health commander role.

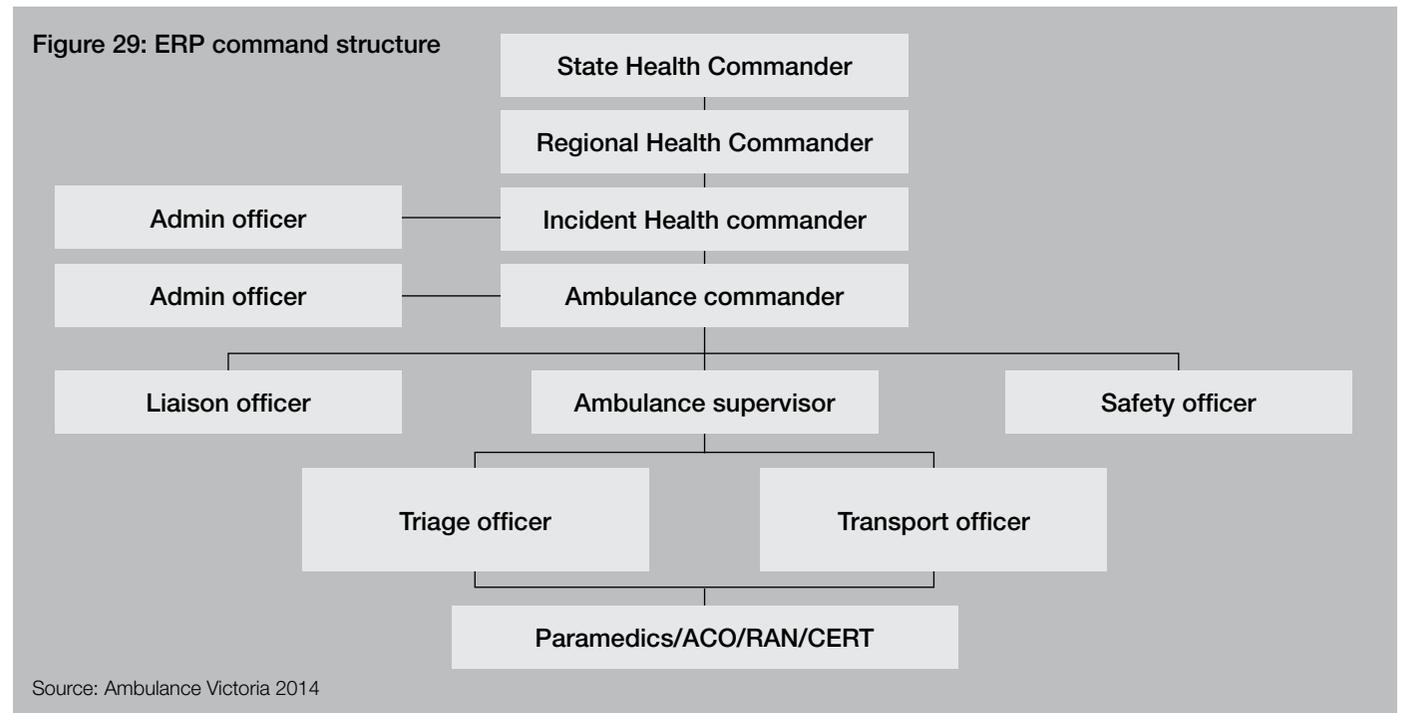
State Health Emergency Response Plan (SHERP)

Escalation to the SHERP will occur in line with transitional arrangements contained within either the regional or state plans.

SHERP provides a framework to ensure a coordinated whole of health approach to mass casualty incidents, complex trauma events, mass gatherings and other incidents impacting the health of Victorians.

An all hazards approach is adopted by SHERP to provide all necessary information to enable a safe, effective and coordinated health and medical response to emergencies. This includes:

- the coordination of health resources from the incident site through to affected hospitals
- the management of pre hospital resources and the hospital interface
- the coordination of the resources to support the management of the public health impacts of the incident



Part E - Information on drugs and therapeutic agents

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Information on drugs and therapeutic agents

This section of the RANEGs has been specifically written to focus on the pharmacology relevant to selected medical emergencies. It is not intended that this section be seen as a standard text on pharmacology but rather must be read through the eyes of the practicing RAN. Thus, the content has been restricted to authorised RAN practice in Victoria.

Name	Generic drug and therapeutic agents names are used where appropriate. Some 'common' proprietary names are included in brackets for clarity.	Contraindication	Indicates absolute contra indications to the use of a particular drug and therapeutic agents as it relates to the RANEGs.
Schedule	A nationally agreed system of assigning drugs and poisons in accordance with the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) for inclusion in each state/territory's drugs and poisons legislation. Drugs or medicines are regulated by the Drugs, Poisons and Controlled Substances Act and Regulations in Victoria and are classified into Schedules 1–9. Each schedule has associated restrictions. The purpose of classification is to group drugs and poisons that require similar regulatory controls over their availability.	Precautions	Relative contraindications or precautions in the administration of a drug and therapeutic agents are included in this section
Presentation	In many instances, drugs and therapeutic agents may be available in presentations other than those listed. However, this manual indicates those presentations that are currently stocked in the majority of BNCs.	Routes of administration	Most drugs and therapeutic agents can be administered through a variety of routes. However, this section includes only those routes of administration considered appropriate for use as specified in the RANEGs. As a general principle, they should not be mixed in the same syringe.
Pharmacology	A statement is included as to the nature of the drug and therapeutic agents.	Side effects	Common side effects attributed to the use of the drug and therapeutic agents are included in this section.
Action	A list of specific actions related to the RAN use of that drug and therapeutic agents.	Drug and therapeutic agents effect	Onset, peak and duration times relevant to the route of administration.
Metabolism	Included to indicate the fate of the particular drug and therapeutic agents within the body.	Usual dosages	Doses for adults and paediatrics as indicated in the RANEGs.
Primary emergency indications	The use of this heading is intended to limit the indications to those emergency situations for which the drug is primarily used as applies to the RANEGs. However, the drug and therapeutic agents may have other indications within healthcare.	Notes	Additional information and/or to highlight certain points.

Adrenaline

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Presentation

1 mg in 1 mL ampoule (1:1,000)

1 mg in 10 mL ampoule (1:10,000)

Schedule S3

Pharmacology

- A naturally occurring alpha (α) and beta (β) adrenergic stimulant

Action

- Increases conduction velocity through A-V node (β 1 effect)
- Increases heart rate (by increasing S-A node firing rate = β 1 effect)
- Increases myocardial contractility (β 1 effect)
- Increases the irritability of the ventricles (β 1 effect)
- Causes bronchodilatation (β 2 effect)
- Causes peripheral vasoconstriction (α effect)

Metabolism

- By monoamine oxidase and other enzymes in the blood, liver and around nerve endings
- Excreted by the kidneys

Primary emergency indications

- Cardiac arrest (VF/VT/PEA/asystole) (IV)
- Anaphylactic reactions (nebulised; IM)
- Croup or suspected croup with life-threatening airway compromise (nebulised)
- Severe asthma (IM)

Contraindications

- Hypovolaemic shock without adequate fluid replacement

Precautions

- Elderly patients
- Patients taking monoamine oxidase (MAO) inhibitors
- Patients with cardiovascular disease
- Adrenaline may have a lesser effect on the patient who is taking beta-blockers

Routes of administration

- Intramuscular
- Intravenous
- Nebulised

Side effects

- Sinus tachycardia
- Supraventricular arrhythmias
- Ventricular arrhythmias
- Palpitations
- Hypertension
- Pupillary dilatation
- May increase size of myocardial infarction

Drug and therapeutic agent effect

	Onset	30–90 secs
Intramuscular:	Peak	4–10 mins
	Duration	5–10 mins
	Onset	30 secs
Intravenous:	Peak	3–5 mins
	Duration	5–10 mins

Adrenaline

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Usual dosages Adult

- a) **Cardiac arrest: Adrenaline 1 mg (1000 mcg) IV** bolus. If no response repeat every 4 minutes (double time intervals in the hypothermic patient)
- b) **Anaphylaxis: Adrenaline 500 mcg (0.5 mg) IM (1:1,000)**. May be repeated at 5 minute intervals until satisfactory results or adverse side effects occur. With consideration of a lower dose of **300 mcg (0.3 mg) IM** for small/frail/elderly adults.

Adrenaline 5mg nebulised may be used for mild upper airway obstruction either in conjunction with **Adrenaline IM** or alone

Caution: *Adrenaline is only to be administered to patients suffering life-threatening anaphylaxis – not for a localised allergic reaction*

- c) **Asthma: Adrenaline 500 mcg (0.5 mg) IM (1:1,000)** repeated at 5-10 minute intervals as required to a maximum **1500 mcg (1.5 mg)** if patient not responding to treatment or is unconscious or becomes unconscious with poor or no ventilation but still has a pulse

Usual dosages Paediatric

- a) **Cardiac arrest: Adrenaline 10 mcg/kg (0.01 mg/kg) IV**. Repeat every 4 minutes. (*Note – minimum dose is 100 mcg*) (double time intervals in the hypothermic patient)
- b) **Anaphylaxis: Adrenaline 10 mcg/kg (0.01 mg/kg) IM (1:1,000)**. Repeat **Adrenaline 10 mcg/kg (0.01 mg/kg) IM** every 5 minutes, until satisfactory results or adverse side effects occur
Adrenaline 5mg nebulised may be used for mild upper airway obstruction either in conjunction with **Adrenaline IM** or alone
- c) **Croup:**
Severe – **Adrenaline 5 mg/5 mL nebulised (1:1,000)** with oxygen and cardiac monitoring. If relapse or no improvement repeat as required
Moderate - consider **Adrenaline 5mg/5mL nebulised (1:1,000)** if patient not improved after 30 minutes post **prednisolone** administration
- d) **Asthma: Adrenaline 0.01 mg/kg (10 mcg/kg) IM (1:1,000)** repeated every 5-10 minutes as required to a maximum of **0.03 mg/kg (30 mcg/kg)** if patient not responding to treatment or is unconscious or becomes unconscious with poor or no ventilation (but still has a pulse)

Note: All patients administered adrenaline **must** be transported to definitive care. Beware the limited duration of action of adrenaline and the potential for recurrence of symptoms.

Aspirin

Version: 3 Reviewed: December 2017

Presentation

300 mg tablet (or chewable tablet)

Schedule S2

Pharmacology

- Antiplatelet aggregation agent
- Anti-inflammatory
- Antipyretic
- Analgesic

Action

- Antithrombotic action based on the ability to reduce platelet aggregation fibres at sites of vascular injury

Metabolism

- Converted to salicylic acid in many tissues but primarily in the gastrointestinal mucosa and the liver
- Excreted by the kidneys

Primary emergency indications

Any patient who has had:

- chest pain or symptoms suspected to be acute coronary syndrome

Contraindications

- Hypersensitivity to aspirin/salicylates
- Bleeding disorders
- Current GI bleeding
- Suspected dissecting AAA
- Chest pain associated with psychostimulant overdose if SBP >160

Precautions

- Asthma (although rare, Aspirin can set off asthma)
- History of peptic ulcers or gastrointestinal bleeding
- Current anti coagulant therapy

Routes of administration

- Oral (with/or followed by water when possible)

Side effects

- Epigastric pain/discomfort
- Nausea/vomiting
- Hypersensitivity reactions
- Gastrointestinal bleeding
- Increased bleeding time

Drug and therapeutic agent effect

- Depends on the stomach contents
- 10 minutes onset of effect
- Anti platelet action 8–10 days

Usual Dosages

Adult

Aspirin 300 mg oral (tablet x 1)

Paediatric

Not indicated for use in paediatrics

Note: In the case of acute coronary syndrome aspirin is to be administered even if the patient is pain free upon arrival, unless contraindicated. In this setting, aspirin is administered for its anti platelet effect, not for its analgesic effect.

Atropine sulphate

Version: 3 Reviewed: December 2017

Presentation

0.6 mg (600 mcg) in 1 mL ampoule

1.2 mg (1200 mcg) in 1 mL ampoule

Schedule S4

Pharmacology

- An anticholinergic agent

Actions

- Inhibits the actions of acetylcholine on postganglionic cholinergic nerves at the neuro-effector site, e.g. as a vagal blocker and allows sympathetic effect to:
 - increase pulse rate by increasing SA node firing rate
 - increase the conduction velocity through the AV node
- Antidote to reverse the effects of cholinesterase inhibitors, e.g. organophosphate insecticides, 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

Metabolism

- By the liver
- Excreted mainly via the kidneys

Primary emergency indications

- Organophosphate poisoning with excessive cholinergic effects

Contraindications

- Nil of significance in the above indication

Precautions

- Do not increase heart rate to above 100 (adults)
- Glaucoma

Route of administration

- IV injection

Side effects

- Tachycardia/palpitations
- Dry mouth
- Dilated pupils/blurred vision
- Urinary retention
- Confusion, restlessness (in large doses)
- Hot, dry skin (in large doses)

Drug and therapeutic agent effect

- Intravenous effects

Onset < 2 mins

Peak < 5 mins

Duration 2–6 hours

Usual dosages

Adult

Organophosphate poisoning

If salivation compromises airway or bronchospasm and/or bradycardia with poor perfusion and hypotension

Atropine 1200 mcg IV every 5 minutes until excessive cholinergic effects resolve

Ceftriaxone

Version: 6 Reviewed: December 2017

Presentation

1g sterile powder in vial

Schedule S4

Pharmacology

- Cephalosporin antibiotic

Metabolism

- Excreted unchanged in urine (33%–67%) and in bile

Primary emergency indications

- Suspected meningococcal septicaemia

Typical purpuric rash consistent with meningococcal septicaemia and evidence of septicaemia (i.e. signs of headache, fever, arthralgia, altered conscious state, photophobia, hypotension and/or tachycardia)

Contraindications

- Allergy to cephalosporins
- Concurrent treatment with calcium containing solutions (i.e. Hartmann's), even if via different infusion lines.

Precautions

- Allergy to penicillins

Route of administration

- Intravenous route (preferred)
- Intramuscular route (if IV access unable to be obtained or paediatric patient)

Side effects

- Nausea and vomiting
- Skin rash

Usual dosage

Adult

Ceftriaxone 1g IV diluted with **10 mL water for injection** and administer over 2 minutes.

Ceftriaxone 1g IM made up to 4 mL using **1% Lignocaine 3.5 mL**. Dose to be administered in lateral upper thigh or other large muscle mass.

Paediatric

Ceftriaxone 50 mg/kg (up to 1g) IM. Make up **Ceftriaxone 1g IM** to 4 mL using **1% Lignocaine 3.5 mL**. Dose to be administered in lateral upper thigh.

Dexamethasone

Version: 2 Reviewed: December 2017

Presentation

8 mg in 2 mL Glass Vial

4 mg in 1 mL Glass Vial

Schedule S4

Pharmacology

- A synthetic corticosteroid secreted by the adrenal cortex

Action

- Relieves inflammatory reactions and provides immunosuppression

Metabolism

- By the liver and other tissues, and excreted predominantly by the kidneys

Primary emergency indications

- Asthma
- Anaphylaxis
- COPD

Contraindications

- Known hypersensitivity to dexamethasone

Precautions

- Solutions that are not clear or are contaminated should be discarded

Route of administration

- Intravenous
- Intramuscular

Side effects

- Nil of significance for indications in RANEGs

Drug and therapeutic agent effect

IV	Onset	30–60 mins
	Peak	2 hours
	Duration	36–72 hours

Usual dosage

Adult

Dexamethasone 8 mg IV/IM stat dose when practicable (within first hour or in transit) for mild, moderate or severe asthma/COPD

Dexamethasone 8mg IV if moderate allergic reaction or anaphylaxis

Paediatric

Not indicated for use by RANs

Fentanyl

Version: 1 Reviewed: December 2018

Presentation

250 mcg in 1 mL glass ampoule or cartridge (IN use only)

Schedule S8

Pharmacology

- A synthetic opioid analgesic

Action

CNS effects:

- Depression – leading to analgesia
- Respiratory depression – leading to apnoea
- Dependence (addiction)

Cardiovascular effects:

- Decreases conduction velocity through the A-V node

Metabolism

- By the liver; excreted by the kidneys

Primary emergency indications

- Analgesia – IN
 - History of hypersensitivity or allergy to morphine
 - Known renal impairment / failure
 - Short duration of action desirable
 - Hypotension
 - Nausea and/or vomiting

Contraindications

- History of hypersensitivity
- Late second stage of labour

Precautions

- Elderly/frail patients
- Impaired hepatic function
- Respiratory depression, e.g. COPD
- Current asthma
- Patients on monoamine oxidase inhibitors
- Known addiction to opioids
- Rhinitis, rhinorrhea or facial trauma (IN route)

Routes of administration

- Intranasal

Side effects

- Respiratory depression
- Apnoea
- Rigidity of the diaphragm and intercostal muscles
- Bradycardia

Drug and therapeutic agent effect

Intranasal:	Onset	Immediate
	Peak	2 mins
	Duration	30 – 60 mins

Usual dosages

Adult

Fentanyl 200 mcg IN

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

Adult - Frail/Elderly, weight < 60kg

Fentanyl 100 mcg IN

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

Paediatric

Small child (10 – 17 kg): **25 mcg IN**

Medium child (18 – 39 kg): **25 – 50 mcg IN**

Repeat initial dose at 5 – 10 minute intervals (consult ARV after **3 doses**)

Consult with ARV for doses in children < 10 kg

Furosemide

Version: 4 Reviewed: December 2017

Presentation

20 mg in 2 mL ampoule

Schedule S4

Pharmacology

- Loop diuretic – inhibits reabsorption from the ascending loop of Henle in the renal tubules

Action

- Promotes diuresis
- Causes venous dilatation and therefore decreases venous return

Metabolism

- Excreted by the kidneys

Primary emergency indications

- Acute Pulmonary Oedema (Cardiogenic)

Contraindications

- Known severe adverse reaction
- Pulmonary oedema due to other than heart failure, for example:
 - drowning
 - inhaled toxins/poisons
 - head injury

Precautions

- Hypotension

Routes of administration

- Intravenous
- Intramuscular (if IV access not available)

Side effects

- Hypotension

Drug and therapeutic agent effect

Intramuscular:	Onset	10 mins
	Peak	30 mins
	Duration	2–3 hours
Intravenous:	Onset	5 mins
	Peak	20 - 60 mins
	Duration	2–3 hours

Usual dosages

Adult

Furosemide 40 mg IV slowly over 1 minute (or patient's normal daily dose)

Furosemide 40 mg IM (or patient's normal daily dose)

Paediatric

Not indicated

Note: A patient already on **furosemide** may be given dose equivalent of their total daily dose (max 100 mg).

Note: IM injection may require 2 or more injection sites.

Note: **Furosemide** is not a first line therapy for acute pulmonary oedema.

Glucagon

Version: 3 Reviewed: December 2017

Presentation

Combination package containing 2 vials:

- 1 vial of freeze dried powder (1 mg)
- 1 vial of 1mL diluent solution

Schedule S3

Pharmacology

- An antihypoglycaemic hormone produced in the pancreas
- Glycogenolysis

Action

- Increases metabolism of stored glycogen in the liver and skeletal muscles, yielding glucose to raise the blood sugar level

Metabolism

- By the liver, kidney and plasma, as well as its site of action

Primary emergency indications

- Suspected or known hypoglycaemia in patients unable to be treated with IV or oral glucose

Contraindications

- Nil of significance if used as indicated

Precautions

- May be ineffective in patients lacking stored glycogen e.g. alcoholic patients with impaired liver function, or starvation

Routes of administration

- Intramuscular

Side effects

- Nausea and vomiting (rare)

Drug and therapeutic agent effect

Onset	5 mins
Duration	25 mins

Usual dosages

Adult and paediatric

- ≥ 25 kg: **glucagon 1 mg IM**
- < 25 kg: **glucagon 0.5 mg IM**

Note: Dissolve the **glucagon** powder by adding the entire contents of the diluting solution into the vial containing the freeze dried glucagon powder. Ensure the powder is completely dissolved before administering.

Note (adult): Administration of **glucose 10% IV** is preferable to **IM glucagon** administration for hypoglycaemia. If it is not possible to administer **glucose 10% IV** within 10 minutes, glucagon should be given.

Glucose 10%

Version: 4 Reviewed: December 2017

Presentation

50 g in 500 mL infusion soft pack

25 g in 250 mL infusion soft pack

Not a scheduled agent

Pharmacology

- A slightly hypertonic crystalloid solution
- Composition: sugar and water

Action

- Provides a source of energy, especially the brain

Metabolism

- Broken down in most tissue to provide energy
- Stored in liver and muscle as glycogen
- Distributed throughout total body water

Primary emergency indications

- Symptomatic hypoglycaemia (BGL < 4 mmol/L) in patients with an altered conscious state who are unable to self-administer oral glucose

Contraindications

- Nil

Precautions

- Ensure patency of the vein before administration

Routes of administration

- Intravenous infusion

Side effects

- Nil

Drug and therapeutic agent effect

Intravenous:	Onset	3 mins
	Duration	Dependant on severity of hypoglycaemic episode

Usual dosages

Adult

1st dose = 15g (150mL) IV

2nd dose = 10mg (100mL) IV

Paediatric

Glucose 10% not indicated for use by RAN.

Use **glucagon 0.5–1 mg IM**

Glyceryl trinitrate (GTN)

page 1 of 2 Version: 7 Reviewed: December 2018

Presentation

0.3 mg tablet (300 mcg)

Schedule S3

GTN 10 mg/24hr patch (0.4 mg/hr)

Schedule S4

Pharmacology

- Vasodilation – vascular smooth muscle relaxant

Action

- Decreases preload by increasing venous capacity, pooling venous blood in the peripheral veins and reducing ventricular filling pressure
- Decreases arterial blood pressure – after load
- Mild collateral coronary artery dilation may improve blood supply to ischaemic areas of the myocardium
- Reduces systolic, diastolic and mean arterial blood pressure, whilst usually maintaining coronary perfusion pressure
- Reduces myocardial oxygen demand

Metabolism

- Readily absorbed in the buccal mucosa and is rapidly metabolised by the liver

Primary emergency indications

- Chest pain associated with acute coronary syndrome
- Cardiogenic acute pulmonary oedema

- Autonomic dysreflexia
- Severe Hypertension in Preeclampsia (consult with PIPER)
 - SBP > 170 mmHg
 - DBP > 110 mmHg

Contraindications

- Known severe adverse reaction/hypersensitivity
- SBP < 110 mmHg (tablet)
- SBP < 90 mmHg (patch)
- Sildenafil Citrate 'Viagra' or vardenafil 'Levitra' administration in the previous 24 hours or tadalafil 'Cialis' administration in the previous 4 days (PED5 inhibitors)
- HR > 150
- Bradycardia HR < 50 (excluding autonomic dysreflexia)
- Ventricular tachycardia
- Inferior STEMI with SBP < 160
- Right ventricular infarct

Precautions

- No previous administration
- Elderly patients
- Recent AMI
- Concurrent use with other tocolytics

Routes of administration

- Sublingual – buccal mucosa
- Transdermal

Side effects

- Hypotension
- Tachycardia
- Facial/skin flushing (uncommon)
- Headache
- Bradycardia (occasionally)

Drug and therapeutic agent effect

	Onset	30 secs–2 mins
Tablet	Peak	5-10 mins
	Duration	15–30 mins
Transdermal	Onset	up to 30 mins
	Peak	2 hours

Special note:

Many GTN presentations currently available are presented in 300mcg dosages per tablet. Correct dosages should be checked prior to administration)

Glyceryl trinitrate (GTN)

page 2 of 2 Version: 7 Reviewed: December 2018

Usual dosages

Adult

GTN 300 to 600 mcg SL

Caution: *If the patient has not previously taken GTN, only administer 1 tablet (300 mcg) sublingually*

GTN 10 mg/24hr (0.4 mg/hr) patch

If sudden hypotension, syncope, or severe headache remove GTN tablet or patch

Paediatric

Not indicated for paediatrics without medical direction

Note: Subsequent doses of 1 or 2 tablets at 5 minute intervals until all chest pain/tightness/discomfort ceases or significant improvement in SOB. Cease administration if SBP < 110 mm Hg.

Special note:

Storage:

- Glyceryl Trinitrate is susceptible to heat and moisture. Ensure tablets are stored in their original light resistant, tightly sealed bottles. The foil pack of the patches should be intact.
- Do not administer the patient's own medication, as its storage may not have been stored in optimum conditions or may have expired.
- Tablets should be discarded and replaced after 1 month.
- Patches should be discarded prior to use-by date.
- 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 had the drug to determine if Glyceryl Trinitrate is contraindicated.
- Tadalafil "Cialis" may also be prescribed to men for Rx of benign prostatic hypertrophy. This is a new indication for the drug and may lead to an increased number of patients under this Rx program.

Ipratropium bromide

Version: 3 Reviewed: December 2017

Presentation

250 mcg in 1 mL nebulizer or polyamp

Schedule S4

Pharmacology

- Anticholinergic bronchodilator

Action

- Allows bronchodilatation by inhibiting cholinergic bronchomotor tone (i.e. blocks vagal reflexes that mediate bronchoconstriction)

Metabolism

- Excreted by the kidneys

Primary emergency indications

- Severe respiratory distress associated with bronchospasm
- COPD

Contraindications

- Known hypersensitivity to Atrovent and/or atropine or its derivatives

Precautions

- Glaucoma
- Avoid contact with eyes

Routes of administration

- Nebulised in combination with salbutamol

Side effects

- Headache
- Nausea
- Dry mouth
- Skin rash
- Tachycardia (rare)
- Palpitations (rare)
- Acute angle closure glaucoma secondary to direct eye contact (rare)

Drug and therapeutic agent effect

Onset	3–5 mins
Peak	1.5–2 hours
Duration	6 hours

Usual dosages

Adult

500 mcg = 2 polyamps/2 mL

Paediatric

250 mcg = 1 polyamp/1 mL

Special note:

- 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 entering the eyes.
- Ipratropium bromide must be nebulised in conjunction with salbutamol and is to be administered as a single dose only.

Lignocaine hydrochloride

Version: 4 Reviewed: December 2017

Presentation

50 mg in 5 mL amp (1%) for intramuscular injection

Schedule S4

Pharmacology

- Local anaesthetic agent

Action

- Prevents initiation and transmission of nerve impulses causing local anaesthesia (1% solution)

Metabolism

- By the liver (90%)
- Excreted unchanged by the kidneys (10%)

Primary emergency indications

- Diluent for ceftriaxone for IM administration in suspected meningococcal disease

Contraindication

- Known hypersensitivity
- Personal or family history of malignant hyperthermia
- Muscular Dystrophy

Precautions

- It is important to rule out inadvertent IV administration due to potential CNS complications

Route of administration

- Intramuscular as diluent for **ceftriaxone**

Side effects

The following side effects may be seen if inadvertently administered intravenously:

- Central nervous system effects (common):
 - drowsiness
 - disorientation
 - decreased hearing
 - blurred vision
 - change or slurring of speech
 - twitching and agitation
 - convulsions
- Cardiovascular effects (uncommon):
 - hypotension
 - bradycardia
 - sinus arrest
 - AV block
- Respiratory effects (uncommon):
 - difficulty in breathing
 - respiratory arrest

Drug and therapeutic agent effect

Onset	Rapid
Duration	60–90 mins

Usual dosage

Adult and paediatric

Diluent for **ceftriaxone IM** only. Add **3.5 mL 1% lignocaine hydrochloride** to **ceftriaxone** to make up 4 mL solution.

Methoxyflurane

Version: 5 Reviewed: December 2018

Presentation

3 mL glass bottle with plastic seal

Schedule S4

Pharmacology

- Inhalation anaesthetic/analgesic agent at low concentrations

Action

- CNS depressant

Metabolism

- Excreted mainly by the lungs
- By the liver

Primary emergency indications

- Pain relief

Contraindications

- History of liver or renal disease/impairment
- Exceeding total dose of 6 mL in a 24-hour period
- Concurrent use of tetracycline antibiotics
- Personal or family history of malignant hyperthermia
- Muscular Dystrophy

Precautions

- Pre-eclampsia
- Concurrent use with Oxytocin may cause hypotension

Routes of administration

- Self administered under supervision – inhalation (with supplemental oxygen)
- 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

Side effects

- Drowsiness
- Exceeding the maximum dose of 6 mL in a 24-hour period may lead to renal/hepatic toxicity
- Decrease in BP and bradycardia (rare)

Drug and therapeutic agent effect

Onset	within 8–10 breaths
Duration	3–5 mins once discontinued

Usual dosages

Adult and paediatric

- The maximum initial priming dose for **Methoxyflurane** is 3 mL (instilled into analgiser/inhaler +/- supplemental oxygen at 2 Lpm). This will provide approximately 25 min of analgesia and may be followed by one further 3 mL dose once the initial dose is exhausted if required.
- Maximum dose of 6 mL in 24 hours

Caution: *Do not deliberately induce unconsciousness using methoxyflurane*

Do not administer in a confined space. Ensure adequate ventilation

Note: Methoxyflurane should be self-administered under supervision; therefore, the actual dosage is regulated by the patient.

Due to the delayed analgesic action of methoxyflurane, this agent should be given when appropriate, prior to painful processes and procedures.

Metoclopramide

Version: 4 Reviewed: December 2017

Presentation

10 mg in 2 mL ampoule

Schedule S4

Pharmacology

- Anti-emetic

Action

- Accelerates gastric emptying and upper intestinal motility
- Dopamine receptor antagonist

Metabolism

- By the liver
- Excreted by the kidneys

Primary emergency indications

Nausea/vomiting associated with:

- Chest pain/discomfort of a cardiac nature
- Opioid administration
- Cytotoxic chemotherapy or radiotherapy treatment
- Severe gastroenteritis

Prophylaxis:

- In awake spinal immobilised patients
- Eye trauma

Contraindications

- Known severe adverse reaction
- Paediatrics
- Suspected bowel obstruction or perforation
- Gastrointestinal haemorrhage

Precautions

- Undiagnosed abdominal pain
- Adolescents (< 20 years)
- Administer slowly over 1 min to minimise risk of extrapyramidal reactions

Routes of administration

- Intravenous
- Intramuscular

Side effects

- Drowsiness, lethargy
- Dry mouth
- Oculogyric crisis
- Extrapyramidal reactions (usually the dystonic type)
- Muscle tremor

Drug and therapeutic agent effect

Intramuscular:	Onset	10–15 mins
	Duration	1–2 hours
Intravenous:	Onset	1–3 mins
	Duration	10–30 mins

Usual dosages

Adult

Metoclopramide 10 mg IM or IV

Repeat 10 mg IV/IM after 10 min if symptoms persist (max. 20 mg)

Paediatric

Not approved for use in paediatrics

Note:

- Not effective for established motion sickness
- Not effective for nausea prophylaxis in the setting of narcotic administration

Midazolam

Version: 6 Reviewed: December 2018

Presentation

5 mg in 1 mL ampoule

Schedule S4

Pharmacology

- CNS depressant

Action

- Anticonvulsant
- Hypnotic and sedative
- Relaxes skeletal muscle

Metabolism

- In the liver
- Excreted by the kidneys

Primary emergency indications

- Status Epilepticus (≥ 5 minutes or ≥ 2 seizures without recovery)

Contraindications

- Known hypersensitivity to benzodiazepines

Precautions

- Reduced dosages may be required in elderly/frail patients, patients with chronic renal failure, congestive cardiac failure or shock
- The CNS depressant effects of benzodiazepines are enhanced in the presence of narcotics and other tranquillisers including alcohol
- Can cause severe respiratory depression in patients with COPD
- Patients with myasthenia gravis

Routes of administration

- Intramuscular
- Intravenous

Side effects

- Respiratory depression
- Loss of airway control
- Depressed level of consciousness
- Hypotension

Drug and therapeutic agent effect

	Onset	3–5 mins
Intramuscular:	Peak	15 mins
	Duration	30 mins
	Onset	1–3 mins
Intravenous:	Peak	10 mins
	Duration	20 mins

Usual dosages

Adult: Midazolam 10mg IM

If seizure activity continues >5 minutes after administration: **Midazolam 2mg IV @ 2 minutely** intervals to a maximum of 6mg IV (in addition to IM)

If seizure activity continues >10 minutes after administration and no IV access: **Midazolam 10mg IM once only**

Consider reduced dosaged for the Elderly, Frail & Small (<60 kg) patient as per Seizure (Adult) RANEG (p 78)

Paediatric:

- **Medium Child** (5 - 11 years) Midazolam 2.5-5 mg IM
- **Small child** (1 - 4 years) Midazolam 2.5 mg IM
- **Small & Large Infant** (< 12 months) Midazolam 1 mg IM
- **Newborn** Midazolam 0.5 mg IM

If seizure activity continues for >10 minutes, Repeat original Midazolam IM dose once only

Morphine sulphate

Version: 5 Reviewed: December 2017

Presentation

10 mg in 1 mL ampoule

Schedule S8

Pharmacology

- Narcotic analgesic

Action

- Acts on the CNS to reduce pain
- Respiratory depression
- Decreases gag and cough reflexes
- Decreases rate of AV node conduction
- Vasodilation
- Stimulation (changes of mood, euphoria or dysphoria, vomiting, pin-point pupils)
- Dependence (addiction)

Metabolism

- By the liver
- Excreted by the kidneys

Primary emergency indications

- To relieve acute pain where inhalation analgesia is inappropriate or ineffective
- Cardiogenic chest pain
- Treatment of acute pulmonary oedema

Contraindications

- Known hypersensitivity
- Late 2nd stage of labour
- Renal Impairment/failure

Precautions

- Acute alcoholism
- Suspicion of drug dependency
- Elderly patients
- Hypotension
- Respiratory depression
- Current asthma
- Respiratory tract burns
- Patients on monoamine oxidase inhibitors

Routes of administration

- Intramuscular
- Intravenous

Side effects

CNS effects:

- Nausea, vomiting
- Respiratory depression
- Pin-point pupils
- Drowsiness
- Euphoria
- Addiction

Cardiovascular effects:

- Bradycardia
- Hypotension

Drug and therapeutic agent effect

Intramuscular:	Onset:	10–30 mins
	Peak	30–60 mins
	Duration	1–2 hours
Intravenous:	Onset:	2–5 mins
	Peak	10 mins
	Duration	1–2 hours

Usual dosages

Adult

Morphine up to 5 mg IV Repeat up to **5 mg** at 5 minutely intervals to **maximum of 20 mg**, titrated to pain and side effects

Unable to obtain IV access:

> **60 kg patient – Morphine 10 mg IM**. Repeat 5 mg after 15 minutes (once only) if required

Elderly, Frail & Small (<60kg) – Morphine 0.1mg/kg IM. Single dose only, consult for further doses

10 mg/mL Morphine IV + 9mL Sodium chloride 0.9% = 1 mg/mL
Maximum dose 20 mg IV

Paediatric

Initial dose: **Morphine 0.05–0.10 mg (50–100 mcg/kg) IM**

Additional doses of **Morphine 0.05 mg/kg (50 mcg/kg) IM** at 5–10 minute intervals until pain is reduced to tolerable level or onset of side effects

Maximum dose of Morphine 0.20 mg/kg (200 mcg/kg) IM

The maximum IM increment given should not exceed 5mg (0.5 mL) without medical consultation

Note: Severe side effects of morphine can be reversed with Naloxone. Occasionally wheals are seen in the line of the vein being used for IV injection. This is not an allergy, only a histamine release

Naloxone

Version: 6 Reviewed: December 2018

Presentation

400 mcg in 1 mL ampoule

Schedule S4

Pharmacology

- Narcotic antagonist

Action

- Prevents or reverses the effects of narcotics

Metabolism

- By the liver

Primary emergency indications

- Altered conscious state and respiratory depression secondary to the administration of narcotic drugs

Contraindications

- Known severe adverse reaction

Precautions

- If a patient is known to be physically dependent on narcotics, be prepared to deal with a combative patient or seizures after administration
- The duration of action of the narcotic may exceed that of naloxone and renarcotisation is always possible so continual monitoring of the patient is required
- Neonates

Routes of administration

- Intramuscular
- Intravenous

Side effects

Symptoms of narcotic withdrawal:

- sweating, goose flesh, tremor
- nausea and vomiting
- agitation
- dilated pupils and excessive lacrimation
- seizures

Drug and therapeutic agent effect

Intramuscular:	Onset	1–3 mins
	Peak	10–15 mins
	Duration	30–45 mins approx.
Intravenous:	Onset	1–3 smin
	Peak	5–10s min
	Duration	30–45s min approx.

Usual dosages

Adult

Naloxone 1.6 mg IM (may be given as 2 x **0.8 mg** injections in different sites)

If symptoms of narcotic overdose begin to return after 30-45 mins., Naloxone 0.8 mg IM.

Paediatric

Naloxone 0.01 mg/kg (10 mcg/kg) IM to achieve an adequate response up to a **maximum of 2 mg**

If inadequate response administer a further **0.01 mg/kg (10 mcg/kg) IM (maximum of 2 mg)**

Note: Following head injury or a narcotic associated cardiac arrest Naloxone should not be administered. Maintain assisted ventilation if required

Ondansetron

page 1 of 2 Version: 1 Reviewed: December 2018

Presentation

4 mg orally dissolving tablet (ODT)

8 mg in 4 mL glass ampoule

Schedule 4

Pharmacology

- An anti-emetic

Action

- 5HT₃ antagonist which blocks receptors both centrally and peripherally

Metabolism

- By the liver

Primary emergency indications

- Undifferentiated nausea and vomiting
- Prophylaxis for spinally immobilised or eye injured patients
- Vestibular nausea in patients < 21 years of age

Contraindications

- Known hypersensitivity
- Concurrent Apomorphine use
- Known Long Q-T syndrome
- Hypokalaemia or hypomagnesaemia

Precautions

- Patients with liver disease should not receive more than 8 mg of Ondansetron per day
- Care should be taken with patients on diuretics who may have an underlying electrolyte imbalance
- Ondansetron contains aspartame and should not be given to patients with phenylketonuria
- Concurrent use of Tramadol
- Pregnancy

Routes of administration

- Oral
- Intravenous

Side effects

- Rare (< 0.1%)
 - Hypersensitivity reactions (including anaphylaxis)
 - Q-T prolongation
 - Widened QRS complex
 - Tachyarrhythmias (including AF and SVT)
 - Seizures
 - Extrapyrimal reaction
 - Visual disturbances (including transient loss of vision)
- Common (> 1%)
 - Constipation
 - Headache
 - Fever
 - Dizziness
 - Rise in liver enzymes

Ondansetron

page 2 of 2 Version: 1 Reviewed: December 2018

Drug and therapeutic agent effect

Orally dissolving table

Onset	2 minutes
Peak	20 minutes
Duration	2 hours

Intravenous

Onset	5 minutes
Peak	10 minutes
Duration	between 2.5 and 6.1 hours

Usual dosages

Adult

4mg ODT orally

Repeat 4mg ODT if symptoms persist (max. 8mg).

8mg IV

If the patient is unable to tolerate ODT or IV is in situ

Paediatric

Small Child (1-4 years) 2mg ODT

Medium Child (5-11 years) 4mg ODT

Note: IV doses should be delivered as a slow push (minimum 30 seconds)

Oxygen

page 1 of 2 Version: 3 Reviewed: December 2017

Presentation

High pressure 'medical oxygen'

Black cylinder with white shoulders or white shoulder and cylinder body (the letter 'N' marked twice on the shoulder denotes the new colour scheme)

- cylinder sizes available in Australia:

- 'B' size 200L

- 'C' size 400-490L

- there are various 'C' size cylinders which are the most common ones used by ambulance services:

- round bottom without long neck 290L with brass collar

- round bottom with long neck 400L

- flat bottom 440L

- 'D' size 1,500-1,650L

Not a scheduled agent

Pharmacology

- A chemical element – a colourless, odourless gas that naturally makes up about 21% of the atmosphere

Action

- Oxygen is essential to the tissues for sustaining life. It is necessary for the production of cellular energy

Metabolism

- N/A

Primary emergency indications

- Treatment of hypoxemia/hypoxia
- To assist organ oxygenation in patients with poor perfusion

Contraindications

- Known paraquat poisoning – no supplemental O₂ should be given
- Lung disease secondary to bleomycin therapy

Precautions

- Prolonged administration to premature neonates
- High concentrations given to severe COPD patients

Caution: *Beware of fire or explosive hazard*

Routes of administration

- Inhalation via:
 - nasal cannula/catheter
 - face mask
 - non-rebreathing (reservoir) mask
 - bag valve mask resuscitator (BVM)
 - laryngeal mask (LMA)

Side effects

- Risk of hypoventilation in some severe COPD patients
- Drying of the mucous membrane of the airway when > 4L/min via nasal cannulae

Drug and therapeutic agent effect

- Supplemental oxygen is administered for the purpose of relieving hypoxemia and preventing tissue/cell damage as a result of a hypoxia

Oxygen

page 2 of 2 Version: 3 Reviewed: December 2017

Usual dosages

The treatment of hypoxia depends on the primary cause.

Low concentration/low-flow oxygen therapy: (< 40%)

Low concentration oxygen therapy should be delivered using nasal cannula, nasal catheters, venti and venturi masks at the appropriate flow rate of oxygen for treatment of patients with chronic rather than acute illness, who receive oxygen therapy over an extended period of time.

Moderate concentration oxygen therapy: (40–60%)

Moderate concentration oxygen therapy should be delivered using a simple face mask at the appropriate flow rate of oxygen (minimum 6 litres per minute flow rate) for the treatment of patients suffering from impaired circulation of oxygen or from an increased need for oxygen.

High concentration oxygen therapy: (> 61–98%)

High concentration oxygen therapy should be delivered using a non-rebreathing mask, bag mask resuscitator (with reservoir bag) or demand head oxygen delivery system for treatment of patients when there is a need for high levels of oxygen for acute hypoxia or poor perfusion.

Intermittent positive pressure ventilation (IPPV)

is artificial respiration that forces air directly into the lungs under pressure, causing the lungs and chest to expand and is indicated for conditions that cause acute respiratory distress, respiratory insufficiency or in respiratory arrest. IPPV should be performed using the bag/mask with oxygen reservoir bag or demand head oxygen delivery system.

Assisted ventilations – intermittent positive pressure breathing (IPPB) using high concentrations of oxygen.

It should be applied during the inspiratory phase in patients who are hypoventilating or have dyspnoea or pulmonary oedema to assist the patient to breathe more deeply utilising the bag/mask resuscitator with reservoir bag.

Therapeutic oxygen administration is indicated for actual hypoxia that is amenable to short-term administration of supplemental oxygen therapy.

Oxytocin

Version: 5 Reviewed: December 2017

Presentation

5 IU in 1 mL ampoule

10 IU in 1 mL ampoule (preferred)

Schedule S4

Pharmacology

- A synthetic oxytocic

Action

- Stimulates the smooth muscle of the uterus, producing rhythmic contractions
- Contraction of myoepithelial cells in mammary alveoli, thus facilitating lactation

Metabolism

- Excreted by liver and kidneys

Primary emergency indications

- Postpartum haemorrhage

Contraindications

- Previous hypersensitivity
- Severe toxæmia (pre-eclampsia)
- Exclude multiple pregnancies before drug administration
- Cord prolapse

Precautions

- If given IV may cause transient hypotension
- Concurrent use with Methoxyflurane may cause hypotension

Route of administration

- Intramuscular

Side effects

Uncommon via IM route:

- Tachycardia
- Bradycardia
- Nausea

Drug and therapeutic agent effect

Intramuscular:	Onset:	2–4 mins
	Duration:	30–60 mins

Usual dosages

To manage postpartum haemorrhage **oxytocin 10 IU IM** and repeat **oxytocin 10 IU IM** if required.

Note:

Must be stored between 2 - 8°C

Paracetamol

Version: 1 Reviewed: December 2018

Presentation

Various (check packaging)

Schedule S2

Pharmacology

- An analgesic and antipyretic agent

Action

- Exact mechanism of action unclear; thought to inhibit prostaglandin synthesis in the CNS

Metabolism

- By the liver
- excreted by the kidneys

Primary emergency indications

- Mild pain

Contraindications

- Hypersensitivity to paracetamol
- Children < 1 month of age
- Paracetamol already administered within past 4 hours
- Total paracetamol intake within past 24 hours exceeding 60 mg/kg (Paediatrics)
- Chest pain in suspected acute coronary syndrome

Precautions

- Impaired hepatic function or liver disease
- Malnourished

Route of administration

- Oral

Side effects

- Hypersensitivity reactions including severe skin rashes (rare)
- Haematological reactions (rare)

Drug and therapeutic agent effect

Intramuscular:	Onset	30 mins
	Duration	4 hours

Usual dosages

Paediatric

15 mg/kg Oral

Prednisolone

Version: 5 Reviewed: December 2017

Presentation

Oral liquid – 5 mg/mL: 30 mL

Tablets – 1 mg, 5 mg or 25 mg

Schedule S4

Pharmacology

- Synthetic glucocorticoid

Action

- Systemic suppression of inflammation and immune response

Metabolism

- By the liver, excreted by the kidney

Primary emergency indications

- Asthma
- Severe or moderate croup

Contraindications

- Known hypersensitivity to corticosteroids

Precautions

- Nil of significance for indications in RANEGs

Routes of administration

- Oral

Side effects

- Nil of significance for indications in RANEGs
- Short-term administration is unlikely to produce harmful effects

Drug and therapeutic agent effect

Oral:	Peak	1–2 hours
	½ life	2–4 hours

Usual dosages

Adult

Mild asthma:

Prednisolone 0.5–1 mg/kg oral (50 mg is appropriate in most adults)

Paediatric

Asthma or severe or moderate croup:

Prednisolone 1 mg/kg oral (one dose only) – daily dose (maximum 50 mg)

Prochlorperazine (Stemetil)

Version: 1 Reviewed: December 2018

Presentation

12.5 mg in 1 mL glass ampoule

Schedule S3

Pharmacology

- An anti-emetic

Action

- Acts on several central neuro-transmitter systems

Metabolism

- By the liver
- excreted by the kidneys

Primary emergency indications

- Known allergy or C/I to **Ondansetron** administration
- Vertigo
- Motion sickness
- Planned aeromedical evacuation

Contraindications

- Circulatory collapse (cool, pale, clammy skin, tachycardia, hypotension)
- CNS depression
- Previous hypersensitivity
- Patients < 21 years of age
- Pregnancy

Precautions

- Hypotension
- Epilepsy
- Pts affected by alcohol or on anti-depressants

Route of administration

- Intramuscular

Side effects

- Drowsiness
- Blurred vision
- Hypotension
- Sinus tachycardia
- Skin rash
- Extrapramidal reactions (usually the dystonic type)

Drug and therapeutic agent effect

Intramuscular:	Onset	20 mins
	Peak	40 mins
	Duration	6 hours

Usual dosages

Adult

Adult (Pt age ≥ 21)

Prochlorperazine 12.5 mg IM

Paediatric

Not indicated

Promethazine

Version: 5 Reviewed: December 2018

Presentation

50 mg in 2 mL ampoule

Schedule S4

10 mg tablets or 25 mg tablets

Schedule S3

5 mg/5 mL elixir 100 mL bottle (paediatric)

Schedule S3

Pharmacology

- Promethazine is a long-acting H1 antagonist (antihistamine) with mild atropine-like anticholinergic effects

Action

- Antihistamine
- Antiemetic
- Sedative

Metabolism

- By the liver
- Excreted in urine and faeces

Primary emergency indications

- Allergic reactions

Contraindications

- Known severe adverse reaction
- < 2 years old

Precautions

- May potentiate the effects of alcohol
- Not to be given subcutaneously and extra care taken to avoid intra-arterial injection
- History of dystonic reactions
- Use with caution in patient with cardiovascular disease, impaired liver function or respiratory impairment
- Caution in acutely dehydrated patients as they have an increased risk of dystonic side effects

Routes of administration

- Deep intramuscular injection
- Oral

Side effects

- Dry mouth
- Restlessness, dizziness, uncoordinated
- Blurred vision
- Sedation – may be profound (confusion, disorientation)
- Oculogyric crisis
- Tremors, seizures

Drug and therapeutic agent effect

	Onset	20 mins
Intramuscular:	Peak	30 mins
	Duration	2–8 hours

Usual dosages

Adult

In mild/moderate allergic reaction **promethazine (Phenergan) 25 mg oral**

Paediatric

In mild allergic reaction **promethazine (Phenergan) 1 mg/kg oral (maximum dose 25 mg)**

In moderate allergic reaction and if delay until medical assessment, administer **promethazine (Phenergan) 1 mg/kg IM (maximum 25 mg)**

Salbutamol (Ventolin)

Version: 5 Reviewed: December 2015

Presentation

Salbutamol for nebuliser use 5 mg in 2.5 mL nebulises

Pressurised metered dose inhaler (pMDI) 100 mcg/actuation

Schedule S4

Pharmacology

- β_2 selective sympathomimetic agonist

Action

- Bronchodilation
- Relaxation of smooth muscles

Metabolism

- By the liver and excreted by the kidneys

Primary emergency indications

Bronchospasm associated with:

- Asthma
- Severe allergic reaction
- Smoke/gas inhalation
- COPD
- Oleoresin capsicum spray exposure

Contraindications

- Nil of significance for the above indication

Precautions

- Ischaemic heart disease
- Acute pulmonary oedema

Routes of administration

- Nebulised inhalation
- pMDI and spacer

Side effects

- Muscle tremor (common)
- Sinus tachycardia

Drug and therapeutic agent effect

Onset	5–15 mins
Duration	15–50 mins

Usual dosages

Adult and paediatric

Salbutamol 10 mg nebulised with oxygen initially.
Repeat **salbutamol 5 mg nebulised** with oxygen every 5 minutes as required

Adult

Salbutamol via pMDI/spacer 400 - 1200 mcg (4-12 puffs) every 20 minutes until resolution of symptoms.
Patient to take **4 breaths** before each subsequent puff

Paediatric

Salbutamol via pMDI/spacer

≥ 6 years **400 - 1200 mcg** (4-12 puffs)
2 - 6 years **200 - 600 mcg** (2- 6 puffs)

Patient to take **4 breaths** before each subsequent puff

Note: Salbutamol is not effective in treating shortness of breath in conditions other than bronchospasm.

Sodium chloride 0.9 % (normal saline)

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Presentation

10 mL polyamp

500 mL + 1000 mL infusion soft pack

Not a scheduled agent

Pharmacology

- An isotonic crystalloid solution
- Water containing sodium and chloride in a similar concentration to that of extracellular fluid

Action

- Transiently increases the volume of the intravascular compartment

Metabolism

Electrolytes:

- excreted by the kidneys

Water:

- excreted by the kidneys
- distributed throughout total body water, mainly in the extracellular fluid compartment

Primary emergency indications

- As a replacement fluid in patients who are inadequately perfused associated with hypovolaemia
- To expand intravascular volume in the non-cardiac, non-hypovolaemic hypotensive patient:
 - isolated neurogenic shock associated with spinal cord injury
 - anaphylaxis
 - burns
- Vehicle for diluting and intravenous administration of emergency drugs
- Fluid TKVO for IV administration of emergency drugs
- Irrigation fluid for burns, lacerations, etc.

Contraindications

- Nil of significance in the above indication

Precautions

- Acute heart failure (i.e. APO)
- Renal failure

Routes of administration

- Intravenous

Side effects

- Nil of significance in the above indication

Drug and therapeutic agent effect

- Intravascular 1/2 life 30–60 mins

Sodium chloride 0.9 % (normal saline)

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Usual dosages

Adult

1. Cardiac arrest: **sodium chloride 0.9% (normal saline) 50 mL IV** drug flush.

ROSC: **Sodium Chloride 0.9% (normal Saline) 20 mL/kg IV** (max). Consult with ARV after 20 mL/kg.

2. Haemorrhagic hypovolaemia: Allow permissive hypotension until SBP < 70 mmHg. If SBP < 70 mmHg, **Sodium Chloride 0.9% (normal saline) 250 mL IV** bolus titrated to effect (SBP ≥ 70mmHg) (max 2L).

Hypovolaemia: Less than adequate perfusion: **Sodium chloride 0.9% IV (max. 40mL/kg)** titrated to patient response. If SBP remains <100mmHg, consult with ARV. If consult is unavailable, **Sodium chloride 0.9% 20mL/kg IV**

3. Isolated neurogenic shock associated with spinal cord injury: **sodium chloride 0.9% (normal saline) 10 mL/kg IV**
4. Hypothermia/cold exposure: Administer **sodium chloride 0.9% (normal saline) 10 mL/kg IV** and repeat **sodium chloride 0.9% 10 mL/kg IV** to a maximum of **40 mL/kg** if required to maintain adequate perfusion (If possible warm saline to 37–42 °C)

Paediatric

1. Cardiac arrest: drug flush
2. Hypovolaemia (haemorrhagic shock) with less than adequate perfusion: **sodium chloride 0.9% (normal saline) 20 mL/kg IV**. If inadequate response and patient remains less than adequately perfused repeat **sodium chloride 0.9% (normal saline) 20 mL/kg IV**. If remains inadequately perfused consult with PIPER. If consult not available administer a further **sodium chloride 0.9% (normal saline) 20 mL/kg IV**
3. Isolated neurogenic shock associated with spinal cord injury: **sodium chloride 0.9% (normal saline) up to 5 mL/kg IV**

Paediatric drug reference chart

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Age & Weight table

RANEG 2019 Update - Paediatric Chart

Age	Yrs	0	3 months	6 months	1	2	3	4	5	6	7	8	9	10	11		
Weight	Kg	3.5	6	8	10	12	14	16	18	20	22	24	26	33	36		
Resps	Normal lower limit	per min	25	25	25	20	20	20	20	16	16	16	16	16	16	16	
	Normal upper limit	per min	60	60	55	40	40	40	40	34	34	34	34	34	34	34	
Pulse	Normal lower limit	per min	110	110	105	85	85	85	85	70	70	70	70	70	70	70	
	Normal upper limit	per min	170	170	165	150	150	150	150	135	135	135	135	135	135	135	
SBP	Normal lower limit	mmHg	60	60	65	70	70	70	70	80	80	80	80	80	80	80	
LMA	iGel		1	1.5	1.5	1.5/2	1.5/2	2	2	2	2	2	2	2.5	2.5/3	3	
DCCS (Biphasic)	4 joules/kg	joules	15	20	30	50	50	70	70	100	100	100	100	120	150	150	
Adrenaline 1:1000 (1 mg/1 ml)	10 mcg/kg IM, IV	mcg	100	100	100	100	120	140	160	180	200	220	240	260	330	360	
		ml	0.1	0.1	0.1	0.1	0.12	0.14	0.16	0.18	0.2	0.22	0.24	0.26	0.33	0.36	
	Croup: 5 mg/5 ml nebulised	1 mL syringe															
		ml	For all ages add 5ml to nebuliser														
Ceftriaxone (250 mg/1 ml)	50 mg/kg IM	mg	175	300	400	500	600	700	800	900	1000	1000	1000	1000	1000	1000	
		ml	0.7	1.2	1.6	2	2.4	2.8	3.2	3.6	4	4	4	4	4	4	
	1g diluted with 3.5ml 1% Lignocaine		1 mL	3 mL				10 mL syringe									
Fentanyl	250 mcg/mL	mcg	N/A	N/A	N/A	25	25	25	25	25 - 50	25 - 50	25 - 50	25 - 50	25 - 50	25 - 50	25 - 50	
	25 mcg actuator	sprays	N/A	N/A	N/A	1	1	1	1	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	
Glucagon (1 mg/1 ml)	IM	ml	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1
		ml	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1
Midazolam	5mg/mL	mg	0.5	1	1	2.5	2.5	2.5	2.5	2.5 - 5	2.5 - 5	2.5 - 5	2.5 - 5	2.5 - 5	2.5 - 5	2.5 - 5	
		ml	0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	0.5 - 1	
		1 mL syringe															

Paediatric drug reference chart

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Age & Weight table

RANEG 2019 Update - Paediatric Chart

Age	Yrs	0	3 months	6 months	1	2	3	4	5	6	7	8	9	10	11		
Weight	Kg	3.5	6	8	10	12	14	16	18	20	22	24	26	33	36		
Morphine (10 mg/1 ml IM)	0.1 mg/kg IM	mg	0.35	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	3.3	3.6	
		ml	0.035	0.06	0.08	0.1	0.12	0.14	0.16	0.18	0.2	0.22	0.24	0.26	0.33	0.36	
	0.05 mg/kg IM	mg	0.175	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.65	1.8	
	max 0.20 mg/kg (3 or 4 doses)	ml	0.0175	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.165	0.18	
1 mL syringe																	
Naloxone (400 mcg/1 ml)	10 mcg/kg	mcg	n/a	60	80	100	120	140	160	180	200	220	240	260	330	360	
		ml	n/a	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.825	0.9	
	1 mL syringe																
Ondansetron	4mg ODT	mg	N/A	N/A	N/A	2	2	2	2	4	4	4	4	4	4	4	
		tablet	N/A	N/A	N/A	half	half	half	half	1	1	1	1	1	1	1	
Paracetamol	15 mg/kg	mg	N/A	90	120	150	180	210	240	270	300	330	360	390	495	540	
		ml (nearest)	N/A	4	5	6	8	9	10	11	13	14	15	16	21	23	
Prednisolone (5 mg/ml liquid)	1 mg/kg oral, max 50 mg	mg	3.5	6	8	10	12	14	16	18	20	22	24	26	33	36	
		ml	0.7	1.2	1.6	2	2.4	2.8	3.2	3.6	4	4.4	4.8	5.2	6.6	7.2	
Promethazine (50 mg/2 ml for IM)	1 mg/kg IM, max 25 mg	mg					12	14	16	18	20	22	24	25	25	25	
		ml					0.48	0.56	0.64	0.72	0.8	0.88	0.96	1	1	1	
	1 mL syringe																
	(5 mg/5 ml elixir)	1 mg/kg oral, max 25 mg	mg					12	14	16	18	20	22	24	25	25	25
ml							12	14	16	18	20	22	24	25	25	25	
Sodium chloride 0.9%	20 ml/kg IV	ml	70	120	160	200	240	280	320	360	400	440	480	520	660	720	
	Neurogenic shock: 5 ml/kg IV	ml	17.5	30	40	50	60	70	80	90	100	110	120	130	165	180	

Part F - Further information

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Abbreviations

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AAA	Abdominal aortic aneurysm	COPD	Chronic obstructive pulmonary disease	ICU	Intensive care unit
ACD	Advanced Care Directive	CPR	Cardio pulmonary resuscitation	IDC	Indwelling catheter
AED	Automated external defibrillator	CSF	Cerebral spinal fluid	IM	Intramuscular
ALS	Advanced life support	DCCS	Direct current counter shock	IPPV	Intermittent positive pressure ventilation
AMI	Acute myocardial infarction	DKA	Diabetic ketoacidosis	IU	International units
APH	Antepartum haemorrhage	ECC	External cardiac compressions	IV	Intravenous
APO	Acute pulmonary oedema	ECG	Electrocardiograph	LMA	Laryngeal mask airway
APPV	Assisted Positive Pressure Ventillation	ETOH	Ethyl alcohol	LOC	Loss of consciousness
ARS	Air Release System	FBC	Fluid balance chart	Lpm	Litres per minute
ARV	Adult Retrieval Victoria	FG	French gauge	LVF	Left ventricular failure
ATS	Australasian triage scale	FWTU	Full ward test urine	MICA	Mobile intensive care ambulance
A-V	Atrioventricular	GCSE	General Convulsive Status Epilepticus	MCA	Motor car accident
AV	Ambulance Victoria	GI Bleeding	Gastro intestinal bleeding	MI	Myocardial infarction
BGL	Blood glucose level	GIT	Gastro intestinal tract	mmol/L	millimoles per litre
bHCG	pregnacy urine test	GCS	Glasgow coma scale	MOI	Mechanism of injury
BOS	Base of skull	GTN	Glyceryl trinitrate	MSE	Mental state examination
BP	Blood pressure	Hib	<i>Haemophilus influenzae b</i>	Mx	Management
BVM	Bag valve mask	hr	hour	NBM	Nil by mouth
CAT	Combat Application Tourniquet	HR	Heart rate	NPA	Nasopharyngeal airway
CATT	Crisis Assessment and Treatment Team	Hx	History	NSAID	Non steroidal anti-inflammatory drugs
CNS	Central nervous system	ICH	Intracranial haemorrhage	O ₂	Oxygen
CO	Cardiac output	ICP	Intracranial pressure	OD	Overdose

Abbreviations

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ODT	Oral disintegrating tablet	SL	Sublingually
OPA	Oropharyngeal airway	SOB	Shortness of breath
PCI	Percutaneous coronary intervention	SpO ₂	Peripheral oxygen saturation
PCR	Patient Care Record	STEMI	ST elevation myocardial infarction
PEFR	Peak expiratory flow rate	SV	Stroke volume
PHx	Past history	SVT	Supraventricular tachycardia
PID	Pelvic inflammatory disease	TBI	Traumatic brain injury
PIPER	Paediatric, Infant, Perinatal Emergency Retrieval	TCA	Tricyclic antidepressant
pMDI	Pressurised metered-dose inhaler	TBSA	Total burn surface area
PEA	Pulseless electrical activity	TIA	Transient ischaemic attack
PPE	Personal protective equipment	TKVO	To keep vein open
PPH	Postpartum haemorrhage	TPT	tension pneumothorax
PRN	as required	URTI	Upper respiratory tract infection
PSA	Perfusion status assessment	UTI	Urinary tract infection
ROSC	Return of spontaneous circulation	VF	Ventricular fibrillation
ROTC	Refusal of treatment certificate	VSS	Vital signs survey
RSA	Respiratory status assessment	VT	Ventricular tachycardia
rtPA	Recombinant tissue plasminogen activator		
RV	Right ventricle		
SA	Sino atrial		
SBP	Systolic blood pressure		
SCI	Spinal cord injury		
SE	Status Epilepticus		
SIDS	Sudden infant death syndrome		

Abbreviations

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Mnemonics

AEIOUTIPS Alcohol, Epilepsy, Insulin, Overdose, Uraemia (or other toxic problems), Trauma or Tumour, Infection, Psychiatric, Stroke

AMPLE Allergies, Medications currently used, Past illness/pregnancy, Last meal, Events/environment related to the injury

AVPU Alert Voice Pain Unresponsive

APGAR Appearance, Pulse, Grimace, Activity, Respirations

DRSABCD Danger, Response, Send for help/Sitreps, Airway, Breathing, Circulation, Defibrillation

ETHANE Exact location, Type of incident, Hazards at scene, Access and egress, Number of casualties, Emergency services at scene and required

FLACC Face, Legs, Activity, Cry, Consolability

IMISTA Introductory information (including patient's name, age and gender), Main presenting problem/MOI, Injuries or Illness, Signs and symptoms (including vital signs), Treatment provided and response to treatment, Any other relevant information

MIST Mechanism of injury, Injuries sustained, Signs and symptoms, Treatment

QUEST Question the child, Use pain rating scales, Evaluate behaviour and physiological changes, Secure parent's involvement, Take cause of pain into account, take action and evaluate results

PASSREPSS Position, Appearance, Speech, Sounds, Rate, Rhythm, Effort, Pulse, Skin, State of consciousness

RICER Rest, Ice, Compression, Elevation and Referral

5HEDS 5 minutes or greater of LOC, H visible or suspected head fracture, E more than one episode of emesis, D neurological dysfunction noted, S seizure activity observed at any time

SITREP Situation Report

SMART Second intercostal space, Mid - clavicular line, Above rib below, Right angles to chest, Towards body of vertebrae

Glossary

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ataxia – lack of muscular coordination

bruit – an abnormal sound or murmur heard on auscultation

bullous – blister like

cognition – the intellectual functions or ways of knowing and thinking

crepitus – a crackling sound or feeling

diaphoresis – profuse sweating

diluent – a diluting agent

diplopia – double vision

distal – farthest from any point of reference (the trunk, in our application)

dorsum – the back; as of the foot or hand

dyskinesia – difficulty in performing voluntary movements

dysphagia – difficulty in swallowing

dyspnoea – laboured or difficult breathing

ecchymosis – a haemorrhagic spot, larger than a petechia (bruising)

epigastrium – the upper and middle region of the abdomen, located within the sternal angle

erythema – redness of the skin

eviscerated – extrusion of viscera outside the body

fundus – top of the uterus; part farthest from the cervix

gravida – pregnant; called gravida 1 during the first pregnancy, gravida 2 during the second, and so on

haematemesis – the vomiting of blood

haemodynamics – the study of the physical aspects of blood circulation, including cardiac function and peripheral vascular physiology

hypercholesterolaemia – excess of cholesterol in the blood

hyperlipidaemia – general term for elevated concentrations of any or all of the lipids in the plasma

hyphaema – haemorrhage into the anterior chamber of the eye

hypovolaemia – abnormally decreased volume of circulating blood

intravascular – within a blood vessel or vessels

introitus – the entrance to a cavity or space

liquor – fluid that fills the amniotic sac and in which the fetus floats

myolysis – degeneration of muscle tissue

neurogenic – forming nervous tissue, or stimulating nervous energy

organomegaly – enlargement of an organ

oropharyngeal – that part of the pharynx between the soft palate and the upper edge of the epiglottis

orthopnea – ability to breathe easily only in the upright position

parity – the condition of woman with respect to her having borne viable offspring

perfusion – the ability of the components of the cardiovascular system to provide tissue with adequate O₂ and nutrients, and remove wastes for the maintenance of normal cell function at that time

petechia, petechiae – a minute, non-raised, perfectly round, purplish red spot

photophobia – abnormal visual intolerance to light

postictal – following a seizure

priapism – persistent abnormal erection of the penis, seen in complete transection of the spinal cord

ptosis – drooping of the eyelid(s)

pulsus paradoxus – a large fall in systolic blood pressure and pulse volume when the patient breathes in

Glossary

page 2 of 2

shock – a syndrome, a continuing process, a state where there is widespread serious reduction in tissue perfusion due to the inability of the cardiovascular system to provide adequate O₂ and nutrients, and remove wastes, for the maintenance of normal cell function

integrity – maintenance of structure and function of the skin

substernal – behind, or underlying, the sternum

supine – lying on the back with the face upwards

syncope – transient loss of consciousness; fainting

tachypnoea – very rapid respirations

torsion – the act of twisting

urticaria – also called hives, weals, often accompanied by severe itching

vasculature – the vascular system of the body

viscera – any large interior organ within a body cavity

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Contacts

Adult Retrieval Victoria (24 hour) 1300 368 661

Ambulance Victoria psychology and support services
1800 MANERS (1800 626 377)

Bush Support Line (24 hour) 1800 805 391

A 24-hour confidential telephone debriefing and psychological support service for all remote health practitioners and their families. It provides immediate support and assistance and is staffed by qualified psychologists with remote, rural and cross-cultural experience. The service provides not only for 'crisis' calls; the psychologists offer practical coping strategies and survival tips to prevent burnout and to prevent crises from developing.

Centre Against Sexual Assault (CASA) crisis line 1800 806 292

The Coroner's Court must be informed of any sudden death, or when the cause of death is uncertain. Such cases must be reported immediately, regardless of the time of day or night. 1300 309 519

Jehovah's Witness Liaison Committee (24 hour) 0414 842 827

National Poisons Centre 131 126

Paediatric, Infant, Perinatal Emergency Retrieval (PIPER) 1300 137 650

Poisons Information Centre 13 11 26

RCH emergency department (03) 9345 6153

Road Trauma Support Services Victoria 1300 367 797

Royal Victorian Eye and Ear Hospital (03) 9929 8666

Red Nose 1300 308 307

Translating & Interpreting Service (TIS) 131 450

Regional psychiatric triage contacts:

Barwon 1300 094 187

Gippsland 1300 363 322

Gleneig (South Western) 1800 808 284

Goulburn & Southern 1300 369 005

Grampians 1300 661 323

Loddon Campaspe/Southern Mallee 1300 363 788

North Eastern Hume – Wodonga 1300 881 104
(including all child/adolescent triage for North Eastern Hume)

North Eastern Hume – Wangaratta 1300 783 347
(including all aged triage for North Eastern Hume)

Northern Mallee 1300 366 375

Victorian Spinal Cord Service at Austin and Repatriation Medical Centre. Page spinal consultant or registrar. (03) 9496 5000

Useful websites

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Ambulance Victoria

www.ambulance.vic.gov.au

Australian College of Critical Care Nurses

www.acccn.com.au

Australian College of Nursing

www.rcna.org.au

Australian College of Rural and Remote Medicine

www.acrrm.org.au

Australian Government Rural Health site

www.health.gov.au/ruralhealth

Australian Resuscitation Council (ARC)

www.resus.org.au

Better Health Channel

www.betterhealth.vic.gov.au

CASA Victoria

www.casa.org.au

Clinicians Health Channel

www.clinicians.vic.gov.au

Council of Remote Area Nurses of Australia Inc. (CRANA)

www.crana.org.au

Department of Health (Victoria)

www.health.vic.gov.au

Department of Health and Human Services (Victoria)

www.dhhs.vic.gov.au

National Asthma Council

www.nationalasthma.org.au

National Health and Medical Research Council

www.nhmrc.gov.au

National Heart Foundation

www.heartfoundation.com.au

National Rural Health Alliance

www.ruralhealth.org.au

Nursing in Victoria, Department of Health

www.nursing.vic.gov.au

Paediatric trauma site

www.rch.org.au/paed_trauma

PrimEd continuing professional development

www.medeserv.com.au

Road Trauma Support Services Victoria (RTSSV)

www.rtssv.org.au

Royal Australian College of General Practitioners – Rural Faculty

www.racgp.org.au/rural

Royal Children's Hospital, Melbourne

www.rch.org.au

Royal Flying Doctor Service

www.flyingdoctor.org.au

Services for Australian Rural and Remote Allied Health (SARRAH)

www.sarrah.org.au

Red Nose

www.rednose.com.au

State Coroner's office

www.coronerscourt.vic.gov.au

The Asthma Foundation

www.asthma.org.au

Victorian State Trauma System

www2.health.vic.gov.au/hospitals-and-health-services/patient-care/acute-care/state-trauma-system

